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FORMULATION AND ANOREXIA NERVOSA

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Summary of the MRP portfolio

Section A

This is a systematic literature review of empirical research investigating the use of formulation in different models of therapy within the treatment of Anorexia Nervosa. The review summarises and critiques 10 studies and clinical and research implications are discussed.

Section B

A mixed-methods study of data from 26 individuals with Anorexia Nervosa who undertook SPEAKS therapy as part of a feasibility trial. Data were collected from formulation maps and narratives for the qualitative analysis and outcome measures for the quantitative analysis.

The study explored schema modes (SMS) in both formulations and questionnaire data. The findings suggested that participants had high levels of internal Critic Modes and suggested that acting on the Angry Child modes could negatively predict outcomes. Results suggest that there is an increased endorsement of the Healthy Adult SM over therapy and that this leads to improvements in clinical functioning and symptoms of AN. Strengths, limitations, and clinical and research implications are discussed.

Section C

Is an appendix of material from the research study.

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Lauren Mountain BSc (Hons) MSc

Major Research Project

Section A: Literature Review

The Use of Formulation in the Psychological Treatment of Anorexia Nervosa

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Abstract

Background and Objectives: Anorexia Nervosa (AN) is a life-threatening mental health problem with poor remission and relapse rates. Formulation can be used to inform interventions, however there is a lack of research into the use of formulation in clinical practice. This review aims to investigate the available evidence regarding the utility of formulation across different models of AN.

Methodology: A systematic review of the literature was carried out to identify empirical research exploring formulation in the treatment of AN across different models.

Results: Ten papers were identified across cognitive behaviour therapy (CBT), Maudsley Anorexia Nervosa Treatment for Adults (MANTRA), specialist supportive clinical management (SSCM), cognitive analytic therapy (CAT), and emotion-focussed therapy (EFT). The evidence indicated that formulation is valued by therapists and clients however further research needs to be undertaken surrounding how formulations are developed, shared, and used across the models. Further, no evidence was found that higher quality formulations lead to improved treatment outcomes.

Considerations and Conclusions: The review was limited by the number of papers available. Of the papers reviewed the quality of the studies was high. Limitations included small sample sizes and lack of control groups. Further research needs to be undertaken across the different models to continue to resolve the gaps in the research, confirm the findings of this review, and identify whether the current models of AN identify the appropriate factors for formulation to facilitate clinical change.

Keywords: Formulation, Case Conceptualisation, Therapy Letters, Eating Disorders, Anorexia Nervosa

Introduction

Anorexia Nervosa

Anorexia Nervosa (AN) is an eating disorder (ED) involving restriction of energy intake leading to significantly low body weight, a fear of gaining weight, and disturbances to one's view of their body (The Diagnostic and Statistical Manual of Mental Disorders-5th ed.; American Psychological Association, 2013). This is accompanied by behaviour that interferes with weight gain, such as vomiting, psychological disturbance, and denial of the seriousness of malnutrition and its impact on physical health. These factors contribute to AN having a higher mortality rate than any other mental health disorder (National Institute for Health and Care Excellence [NICE], 2019). Estimates suggest that the overall incidence of AN is at 6.0 per 100000 and is most common in young women (NICE, 2019).

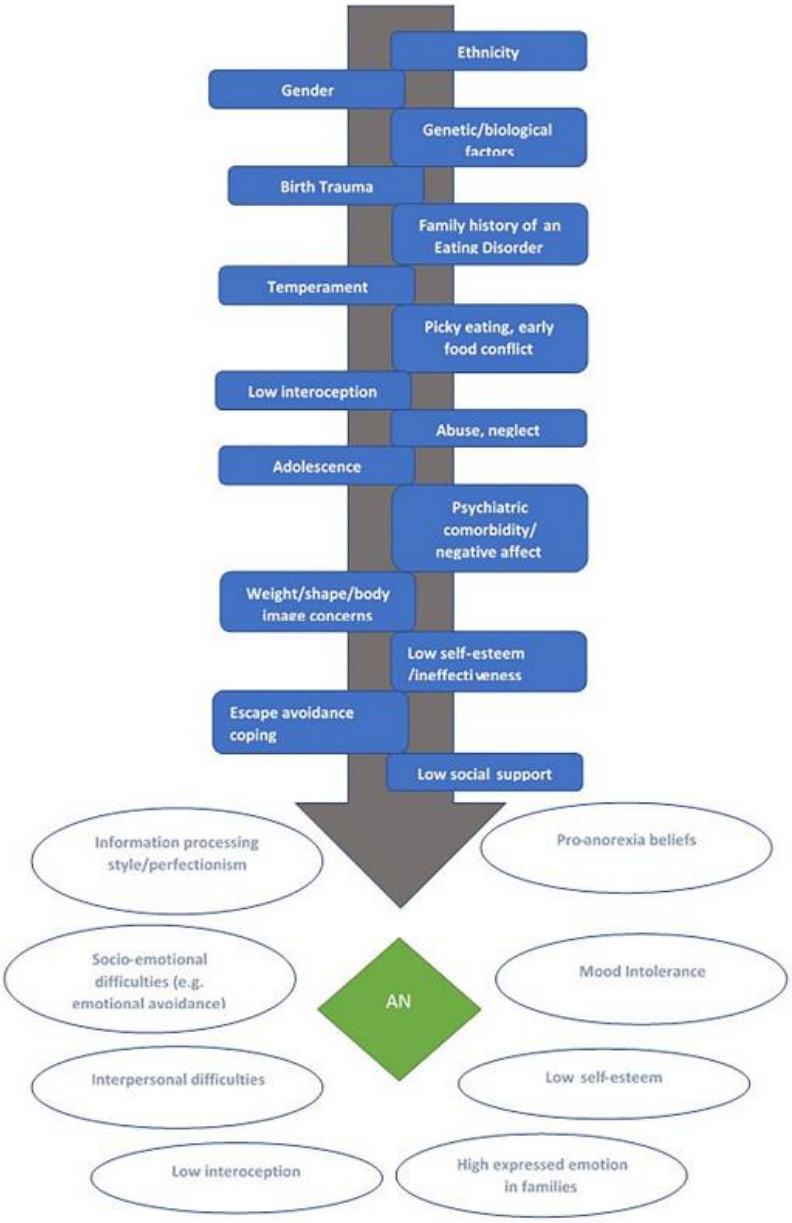
The development and maintenance of AN appears to be due to a complex relationship between genetic, biological, psychological, and socio-environmental factors (Oldershaw et al., 2019). Figure 1 provides a summary of risk and maintenance factors that are associated with AN.

Treatments for AN

NICE guidelines recommend psychological therapy for the treatment of adults with AN (NICE, 2020), specifically individual eating-disorder-focused cognitive behavioural therapy (CBT-E; Fairburn, 2008), Maudsley Anorexia Nervosa Treatment for Adults (MANTRA; Schmidt et al., 2012), or specialist supportive clinical management (SSCM; McIntosh et al., 2006). Despite the breadth of available psychological treatments, AN remission rates remain low at 50% (Murray et al., 2019) with high rates of relapse (20%) (Steinhausen, 2002). Further, systematic reviews have been unable to conclude which treatment is most effective (Hay et al., 2015).

Figure 1

Summary of risk and maintenance factors for AN (Oldershaw et al., 2019)



Current interventions use existing psychological theory to address relevant maintaining factors. However, poor remission rates raise questions around whether the mechanisms of AN are fully understood by the psychological theory and whether the appropriate risk and maintaining factors are being addressed by current therapies (Murray et al., 2019; Oldershaw et al., 2019).

What is formulation?

Medical diagnoses can be used to inform clinical practice, for example consulting NICE guidelines. Psychological formulation (also known as 'case conceptualisation') can be used as an alternative to diagnosis and a tool to relate psychological theory to practice and lead to an individualised understanding of the problem, as well as its development and maintenance (Butler, 1998; DCP, 2010). Johnstone and Dallos (2014) summarise the common features of formulation across therapeutic approaches which include:

- What is the problem?
- How is the problem maintained?
- Why has the problem developed?
- A treatment plan based on the features and psychological theory identified
- Are open to re-formulation

Therefore, formulation aims to understand a person's difficulties within the context of their life circumstances and can be used for understanding all expressions of distress (Johnstone, 2018). Models of therapy can provide a framework for conceptualising specific expressions of distress, such as AN, and differ in what they consider to be most relevant factors (Johnstone & Dallos, 2014). If the model has provided an appropriate framework for conceptualising the development and maintenance of the distress, this can then be targeted during treatment, and lead to positive outcomes. If the model does not have a sound theoretical understanding of the problem, formulations based on these models may not focus on the appropriate factors, and the strategies implemented may not be appropriate or lead to change which therefore may lead to poor outcomes.

Within the psychological treatment of AN, given the number of potential risk and maintenance factors (see Figure 1) formulation could help the therapist, client, and team to

understand the development and maintenance of the ED and collaboratively identify what to work on in therapy. However, when used inefficiently formulation might lead to an unhelpful "everything is relevant" approach and lack focus (Oldershaw et al., 2019).

An overview of treatment models and formulation

Literature indicates that a range of psychological models can be used when developing formulations and psychological treatment plans for those with AN. This paper will now briefly summarise the psychological models recommended for the treatment of AN (NICE, 2019) and how the approach utilises formulation.

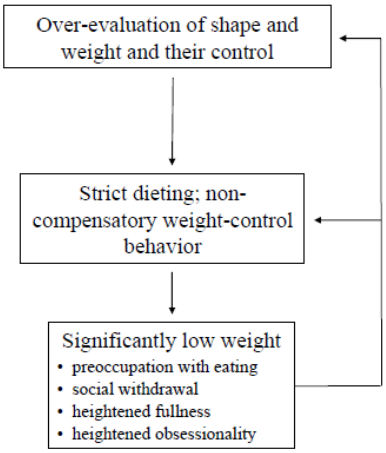
CBT

There is no single leading cognitive behavioural model for AN (Startup et al., 2016, p241), however CBT "enhanced" (CBT-E) has been rigorously evaluated in randomised controlled trials (Byrne et al., 2017; Zipfel et al., 2013). CBT-E is based on a transdiagnostic theory that is applied to all EDs and places emphasis on the processes that maintain the ED rather than those responsible for its initial development (Fairburn, 2008).

Within CBT-E, a formulation is constructed which is intended to be bespoke but is based upon common components. The formulation can involve a longitudinal perspective which is thought to engage the client and reduce risk of relapse (Mountford et al., 2017). However, the focus of the intervention remains on the "here and now" with the aim of increasing awareness of cycles of "unhelpful" responding/reacting to situations (see Figure 2). This then informs which cognitive and behavioural techniques are used to break the cycle, increase motivation, enhance weight gain, and address concerns surrounding this.

Figure 2

CBT- E formulation of "restricting" AN (Fairburn, 2008)



Maudsley Anorexia Nervosa Treatment for Adults (MANTRA)

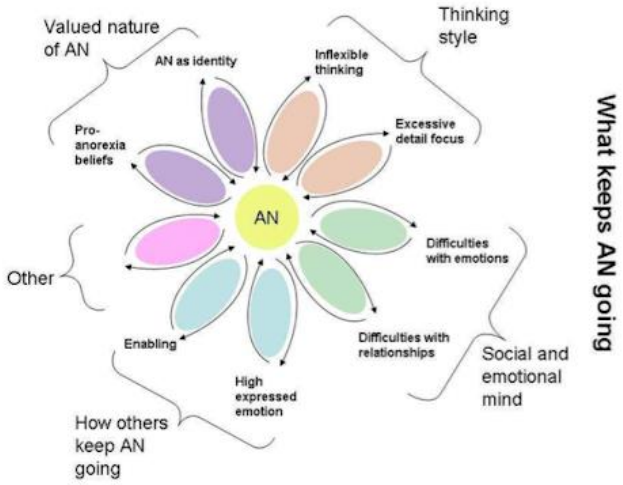
MANTRA is a manualised treatment that has a hierarchy of procedures which focus on specific change in eating and weight within a motivational interviewing framework (Schmidt et al., 2012) based on the cognitive-interpersonal maintenance model (Schmidt & Treasure, 2006). The formulation is depicted as a 'vicious flower' which maps out maintaining factors that can be individualised to the client's experience (see Figure 3) (Schmidt & Treasure, 2006).

A workbook is used to guide the sessions, and treatment is individualised based on the formulation (Carr et al., 2020, P9). This means that optional modules from the treatment protocol can be chosen based on the client's formulation, for example developing a 'non-anorexic identity' or interpersonal difficulties (Oldershaw et al., 2019). At the end of treatment, individuals are encouraged to illustrate their progress through a 'virtuous' flower

of factors that encourage positive health and wellbeing (Startup et al., 2015) and therapists write a summary (reformulation) letter to clients (Hay et al., 2015).

Figure 3

The Vicious Flower of Anorexia (Schmidt et al., 2011)



Specialist supportive clinical management (SSCM)

SSCM (McIntosh et al., 2006) differs from the former therapies in that it is not based on a psychological model (Hay et al., 2015). It was originally developed as a comparison treatment for research trials but was shown to be as effective as the treatments above and so is now used clinical practice (McIntosh et al., 2006). The treatment aims to resume normal eating and weight gain through psychoeducation (Hay et al., 2015) and uses a generic formulation focussed on the role of starvation and eating behaviours in maintaining AN.

Focal Psychodynamic Therapy (FPT)

If CBT-E, MANTRA, or SSCM is ineffective or contraindicated for adults with AN, FPT should be considered (NICE, 2020). FPT is a time-limited form of psychodynamic therapy (Zipfel et al., 2014) where an individualised hypothesis is created regarding how the person

experiences their symptoms (Carr et al., 2020, p.9). Whilst a formulation might be held in mind by the therapist, this is not explicitly shared with the client and the therapist takes a non-directive stance and gives no advice about the eating behaviour or managing symptoms (Dare, 1995).

Cognitive Analytic Therapy (CAT)

CAT was included in the NICE guidelines up until the recent revision in 2020 and has been included in this paper due to the contribution of research into reformulation and therapeutic letters (Hamil et al., 2008; Newell et al., 2009; Tryer & Materson, 2019; Jefferies et al., 2021). CAT combines elements of cognitive therapy and brief psychodynamic therapy (Ryle, 1990). CAT was not specifically developed for individuals with AN, however the model aims to include AN as a target problem, whilst allowing for focus on other maintenance factors (Treasure & Ward, 1997).

Within the therapy, the therapist writes a letter to the client summarising their formulation and a diagram or "map" of the experience of anorexia, themselves, their early experiences, and current relationships is created (Ryle, 1990). Figure 5 is an example formulation (in CAT known as "reformulation"). Clients also receive an end of therapy letter summarising the understanding they have achieved (Ryle, 1990).

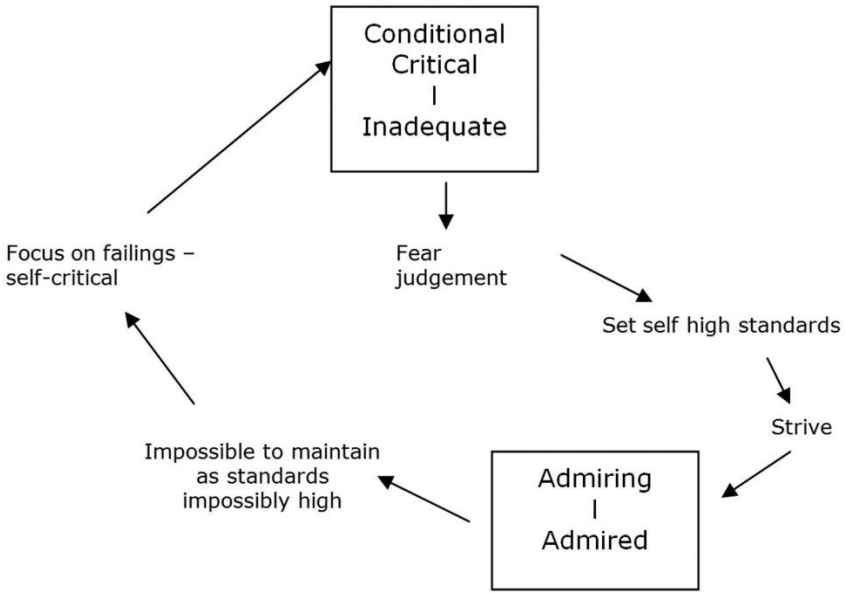
Emotion Focussed Therapy (EFT)

The EFT model aims to change difficult emotions related to various psychological disorders (Osoro et al., 2022). It is hypothesised that EDs emerge to meet the need of unwanted difficult affect (Osoro et al., 2022) and within therapy this is worked with through processing and overcoming avoidance using experiential tasks, which ultimately increases awareness and expression of internal emotional experience (Dolhanty & Greenberg, 2009).

EFT has been included as there appears to be emerging evidence for post-treatment improvements in EDs (Osoro et al., 2022).

Figure 4

Example sequential diagrammatic reformulation (Wicksteed, 2012)



In summary, all the models described hold in mind a psychological formulation, although SSCM is not based on a psychological theory per se. The models differ in the factors they view as most relevant and the explanatory concepts. For example, although both CBT-E and MANTRA consider the role of early life factors in the formulations, themes from early life are not targeted during intervention and the focus is primarily on maintenance factors. In comparison, CAT focuses on interpersonal factors and early life when addressing AN. There are differences in the way the formulation is developed, shared, and used dependent on the model. For example, MANTRA and CAT including letter writing. Therefore, although models of AN are described and formulations are used to apply these to client's difficulties, it is yet to be established whether formulation informs and guides treatment appropriately or whether models identify the relevant mechanisms of change.

Research into formulation

As demonstrated above, formulation is considered to be a central component of psychological therapies and can be involved in the therapeutic process in different ways depending on the type of therapy. There is a surprising lack of research surrounding the use of formulation historically (DCP, 2011), despite extensive research into effectiveness of interventions, the theoretical content, and psychological principles on which formulation is based.

Formulation is an emerging practice-based field and gaps in the research include understanding the process by which clinicians draw up formulations; whether and how formulation improves outcomes; client experiences of formulation; and whether formulation is an intervention or impacts on outcome measures (Challoner and Papyianni, 2018; DCP, 2011; Johnstone, 2018). This is also the case specifically when working with those with an ED.

To summarise, there is a lack of research into the use of formulation in clinical practice, particularly within AN which is a serious eating disorder requiring improved treatment outcomes. CBT-E, MANTRA, SSCM, and CAT are all treatments which utilise formulation, however it is unclear whether the maintenance factors being identified during formulation are appropriately informing treatment and improving treatment outcomes. Further, there is a lack of research into the way formulation is developed, shared, and used in clinical practice. Therefore, given the need for more effective interventions in AN, the use of formulation in treatment within this population needs to be explored.

Scope of the Current Review

This review aims to investigate the available evidence on the formulation process (how it is developed, shared, and used) across different models. It will not review the effectiveness of

current treatments for AN as recent reviews have already done this (Hay et al., 2015; Murray et al., 2019). More specifically, this review will be focusing on the use of formulation in community interventions for adults with a diagnosis of AN. Whilst some formulations are considered to be applicable to all EDs the aim of this review was to focus on the application of these specifically to AN. Additionally, the current review does not have the capacity to consider the formulation and interventions of young people or inpatient settings sufficiently alongside the area that is being explored.

Therefore, the specific research questions for this review are:

- What were the core elements of psychological formulations and were these in line with the proposed underpinning theoretical model? Did they have an impact on treatment outcome?
- Can the processes by which formulations are drawn up and developed throughout therapy be understood?
- What are the client and therapist experience of these processes?
- Does the quality of formulation impact intervention outcomes?

Methodology

Literature Search

A systematic search of the electronic databases Psychinfo, Medline, Pubmed, Web of Science, and ASSIA was conducted in April 2021 (see Figure 7). The search terms were identified through scoping the literature before the systematic search. Specific models were included based on papers that were found during preliminary searches. Terms used were: (eating disorder OR anorex*), (formulation OR reformulation OR conceptualisation OR case conceptualisation OR map* OR therapy letters), AND (cognitive behavioural therapy OR CBT OR CBT-E OR enhanced cognitive behaviour therapy OR focal psychodynamic therapy

OR specialist supportive clinical management OR SSCM OR MANTRA OR Maudsley Model of Anorexia Nervosa Treatment for Adults OR cognitive analytic therapy OR CAT). There were no time period limits in place. Additional articles were sourced through a Google Scholar search and reference lists of identified papers were hand searched. The search was run again in October 2022 including (Emotion Focused Therapy OR EFT) as search terms but no additional papers meeting the inclusion criteria were found.

Inclusion Criteria

Studies were included if they:

- Focussed on formulation or experiences of formulation (client or therapist) for AN
- Participants were adults (age >18)
- Papers stated participants had a diagnosis of AN
- Treatments were delivered in an outpatient treatment setting
- Published within a peer reviewed journal.

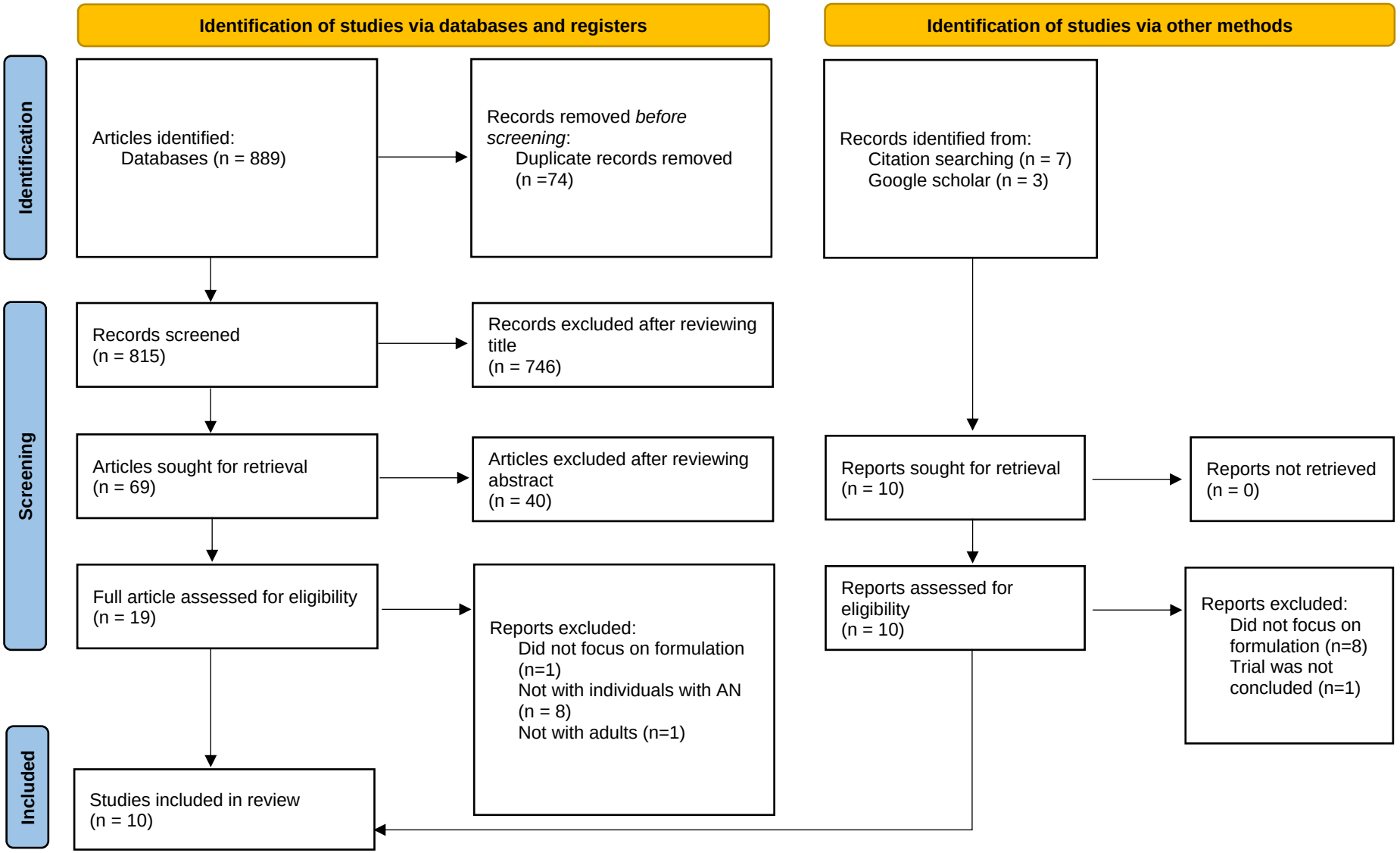
Exclusion Criteria

Studies were excluded if:

- They were not original research, discussed theoretical or conceptual ideas.
- They focussed on effectiveness of therapy, not formulation.

Figure 5

Flow chart of systematic literature search (Page et al., 2020)



Literature Review

Review structure

Nine studies were identified through the systematic search and one paper was found through hand search. The findings of the 10 articles are summarised in Table 1. The findings from the papers were then synthesised, gaps in the literature identified, and quality of the findings were reviewed.

The Joanna Briggs Case Reports, Case Series, Qualitative, and Quasi-Experimental Studies checklists were referred to evaluate the methodological quality of articles (Joanna Briggs Institute, 2020). These checklists were selected over others due to the ability to select a checklist most appropriate to the methodology used in identified papers (Appendix A). Further, whilst some of the papers used data from randomised controlled trials (RCT) the papers performed secondary analysis so it was thought utilising the Quasi-Experimental checklist would be more appropriate. Whilst checklists can be helpful, if applied too rigidly they can mislead conclusions (Booth et al., 2012), therefore the current review used these as a guide to systematically critique, but not to exclude articles or attribute a 'score'.

Overview of Studies

Of the 10 papers, seven were conducted in the United Kingdom (Allen et al., 2016; Bell, 1999; Gladwin & Evangeli, 2013; Lose et al., 2014; Simmonds et al., 2020; Treasure et al., 2019; Waterman-Collins et al., 2014), two in Canada (Dolhanty & Greenberg, 2009; Geller, 2006) and one in Germany (Resmark et al., 2018).

Two of the studies explored formulation for individuals with AN utilising CBT (Geller, 2006; Resmark et al., 2018), five in MANTRA (Allen et al., 2016; Lose et al., 2014; Simmonds et al., 2020; Treasure et al., 2019; Waterman-Collins et al., 2014), two in CAT

(Bell, 1999; Gladwin and Evangeli, 2013) and one in EFT (Dolhanty & Greenberg, 2009). Although EFT was not recommended within NICE guidelines the paper was included as it met the inclusion criteria. Two of the MANTRA papers compared experiences of formulation in MANTRA to SSCM (Waterman-Collins et al., 2014; Lose et al., 2014). Due to the uneven spread of research for each model, this review will combine the evidence to answer the research questions rather than focussing on each model individually.

Of the two case studies, one formulated using the MANTRA model (Treasure et al., 2019), whilst another described a clinical example of an EFT formulation (Dolhanty & Greenburg, 2009). There were three case series: one described formulations and changed beliefs in CBT (Geller, 2006); another retrospectively reviewed case notes for problems and reciprocal roles in CAT (Bell, 1999); and a final paper retrospectively analysed the impact of the quality and delivery of formulation on weight changes within CAT (Gladwin & Evangeli, 2013). Three studies performed secondary analysis on data from RCTs exploring frequency of formulation sessions in CBT-E (Resmark et al., 2018) and therapeutic benefits, model adherence (Allen et al., 2016), and influence of quality of written letters (Simmonds et al., 2020) in MANTRA. Finally, two studies used a qualitative research design utilising semi-structured interviews and thematic analysis (Lose et al., 2014; Waterman-Collins et al., 2014) to explore therapist and clients' experiences of formulating in MANTRA and SSCM. Table 1 summarises the study characteristics and key findings of the papers relating to the research questions.

Table 1

Summary of study characteristics

Cognitive Behaviour Therapy						
Study	Title	Design	Sample	Measures	Analysis	Key findings in line with research questions
Geller (2006)	Mechanisms of Action in the Process of Change: Helpful Eating Disorder Clients Make Meaningful Shifts in Their Lives	Case series	Jennifer (19) - female with anorexia nervosa (AN). Deborah (28) - female with AN. One individual not included as did not meet age criteria.	Case description	Observational	Reported formulations Jennifer struggled to meet the increasingly demanding expectations of her parents and the community to which her family belonged as she transitioned to adulthood. ED became a focus and weight loss was something she did well and kept her connected to her parents at a time when she was feeling pressure to become independent. Deborah - belief that taking care of herself physically or emotionally was a sign of weakness. In a battle with "the system" to prove they were wrong and that she wasn't unwell, but this resulted a lack of energy to resolve problems in her life. Conclusions drawn Trusting therapeutic relationship, inquiry, and experimentation can lead to the reformulation of maladaptive beliefs.

Resmark, Kennedy, Mayer et al. (2018)	Manualised Cognitive Behaviour Therapy for Anorexia Nervosa: Use of Treatment Modules in the ANTOP Study	Secondary analysis of an RCT	65 patients with AN who completed treatment	Stage of therapy Module of ANTOP	Frequency tests Chi square then post hoc analyses	Formulation was the third most used module in CBT-E sessions. Formulation sessions mainly took place in the first stage of therapy (21% of sessions). "Family relationships" and "What have I learnt" formulation worksheets were in the top 10 most distributed worksheets

MANTRA

Study	Title	Design	Sample	Measures	Analysis	Key findings
Allen, O'Hara, Bartholdy et al. (2016)	Written Case Formulation in Treatment of Anorexia Nervosa: Evidence for Therapeutic Benefits	Secondary data from RCT	46 participants with AN who received formulation letters	MANTRA-CFRS[a] Treatment satisfaction No. of sessions attended EDE[b] BMI[c]	Descriptive statistics Linear regression	MANTRA-CFRS scores suggest good adherence of formulations to the MANTRA model. Overall quality of formulations was not significantly associated with outcomes or engagement. Formulations that paid attention to focus of development of AN were associated with greater treatment acceptability. Letters that adopted a reflective and respectful tone predicted significant improvements in Global EDE scores.

Lose, Davies, Renwick et al. (2014)	Process Evaluation of the Maudsley Model for Treatment of Adults with Anorexia Nervosa Trial. Part II: Patient Experiences of Two Psychological Therapies for Treatment of Anorexia Nervosa	Qualitative	17 participants with a DSM-IV diagnosis of AN or EDNOS-AN	Semi-structured interviews	Thematic analysis	Key themes *MANTRA* Formulation and end of therapy letters were well received, perceived as very personal, and a helpful summary of treatment, and something to be shared with carers. Therapists and MANTRA patients agreed on the importance and value of the formulation and end of treatment letters.
Simmonds, Allen, O'Hara et al. (2020)	Therapist Written Goodbye Letters: Evidence for Therapeutic Benefits in the Treatment of Anorexia Nervosa	Secondary data from RCT	41 participants with AN completed treatment and so received a goodbye letter	Letter rating scheme EDE[b] BMI[c] Self-report questionnaires	Correlational study - Descriptive statistics Linear regression and Multiple regression	There was no statistically significant relationship between total letter scores (i.e. overall quality) and BMI or EDE change at 24 months. There was a significant association with total letter scores and BMI at 12 months. Baseline BMI and total letter scores explained 23.8% of the variance in BMI scores at 12 months. End of therapy letters that had a stronger use of an affirming stance were associated with higher BMI scores at 12 months.

Treasure, Schmidt, & Kan (2019)	An Illustration of Collaborative Care with a Focus On The Role of Father in Maudsley Anorexia Nervosa Treatment for Adults (MANTRA)	Case study	1 participant aged 17 years old with a diagnosis of Anorexia nervosa	Case study BMI[c]	Case illustration of formulation	*Formulation* Formulation letter described developmental risk and maintenance factors including socio-emotional difficulties and perfectionism. Three figures - Figure outlining predisposing, precipitating, and perpetuating factors - Vicious flower (maintaining factors) included social isolation, firmly embedded habits, sense of mastery, and role of parents - Interpersonal risk factors and target of family skill sharing. *Client experience* Rose did not think the manual was the correct approach for her at first but appreciated the formulation letter and recognised that the therapist had listened even though they had different perspectives surrounding whether she had an ED.
Waterman-Collins, Renwick, Lose et al. (2014)	Process Evaluation of the Maudsley Model for Treatment of Adults with Anorexia Nervosa Trial. Part I:	Qualitative	20 therapists out of 29 that were involved in the MOSAIC trial who had received training in both MANTRA and SSCM	Semi-structured interviews	Thematic analysis	Key themes *MANTRA formulation* - Therapists found the formulation section hard, however this became easier as they became more familiar - Therapists reflected that the formulation section felt rushed with fixed numbers of sessions - Writing the formulation and end of therapy letter time was consuming, however it was

	Therapist Experiences of Delivering Two Psychological Therapies for Treatment of Anorexia Nervosa	17 female, 3 male				acknowledged that they were a valuable tool and the patients liked them *SSCM formulation* - Therapists felt that the focus of weight restoration and target symptoms at times felt frustrating, as did the standardised SSCM formulation

CAT

Study	Title	Design	Sample	Measures	Analysis	Key findings
Bell (1999)	The Spectrum of Psychological Problems in People with Eating disorders, an Analysis of 30 Eating Disordered Patients Treated with Cognitive Analytic Therapy	Case series	30 eating disordered patients treated with CAT – eight with AN.	Reformulation letters Psychotherapy files Sequential diagrammatic reformulations		Most common problems of clients with AN were: "negative feelings to self", "dependent relations", and "disavowed emotions". Most common reciprocal role procedures were: "ideal care", "loss/neglect", and "critical/striving". There was no consistent pattern between severity of the anorexia and the source of the problem in terms of the patient's reciprocal roles.

Gladwin & Evangeli (2013)	Shared Written Case Formulations and Weight Change in Outpatient Therapy for Anorexia Nervosa: A Naturalistic Single Case Series	Naturalistic single case series approach	Case notes from 15 adult women who had undergone outpatient psychological therapy for AN were reviewed. 14 case formulations were analysed.	Case formulation content coding method – revised [d] Weight and BMI [c]	Broadened median method to plot location of each phase	Evidence that those who failed to gain weight were presented with higher quality formulations. Evidence that delivery of the shared written case formulation can be linked to weight gain (n=5). Overall, delivery of case formulations can be associated with important therapeutic change in AN, both positive and negative.

Emotion-Focused Therapy

Study	Title	Design	Sample	Measures	Analysis	Key findings
Dolhanty & Greenberg (2009)	Emotion-Focused Therapy in a case of Anorexia Nervosa	Case study	24-year-old woman with AN. Initial formulation notes an interpersonal theme	Case study EDI [e] Toronto Alexithymia Scale [f] Beck Depression Inventor [g] Weight and BMI [c]		Eight steps of case formulation are identified. Initial steps involved identifying the presenting problem, listening to and exploring the client's narrative, and gathering historical and current information about relationships. 4: Draw the client's attention to their internal experience and have them attempt to label and express their feelings. 5: Notes that client talks about food, weight, and body image when feelings are talked about. Hypothesized that these issues are a form of interrupting, blocking, or distraction from feelings. 6: Two chair dialogue is used to increase awareness of internal 'critic', assert her healthy needs, and stand up to this part of herself. Themes related to the clients relationship with her

	mother were processed which begin the process of differentiating from her mother and setting boundaries. 7: Intra- and interpersonal personal themes were related to issues of attachment, these were worked through using chair work and strategies to handle feelings. 8: The client came to recognise that processing difficult feelings led her to feel better and allowed her to experience other positive emotions.

Note. [a] MANTRA-CFRS. MATRA-Case Formulation Rating Scheme measures content and style of therapy letters.

[b] EDE. Eating Disorder Examination (Cooper and Fairburn, 1987) is a diagnostic interview that provides a measurement of severity and range of ED symptoms.

[c] BMI. Body Mass Index - weight [kg]/height [m]2

[d] Case formulation content coding method - revised (Eels et al., 2005). A cross-theoretical coding form that evaluates formulations on description, diagnosis, inference, and treatment planning.

[e] EDI. Eating Disorders Inventory (Garner & Olmsted, 1984) is a questionnaire used to assess the presence of EDs.

[f] Toronto Alexithymia Scale (Bagby, Parker, & Taylor, 1994) measures an individual's ability to understand, process, and describe emotions.

[g] Beck Depression Inventory (Beck & Steer, 1987) self-report measure designed to measure severity and symptoms of depression.

Overview of Findings

The quality appraisal tools used in this review (see Appendix A) indicated a good level of quality across single case studies (Dolhanty & Greenberg, 2009; Treasure et al., 2019), case series (Bell, 1999; Geller, 2006; Gladwin & Evangeli, 2013), and qualitative studies (Lose et al., 2014; Waterman-Collins et el., 2014) given the limitations of these design methodologies. The studies that utilised data from RCTs (Allen et al. 2016; Resmark et al. 2018; Simmonds et al., 2020) were also of good quality, however none of the studies included data from comparison groups as analysis was conducted secondary to the main trial. Only one conducted a follow up post-treatment (Simmonds et al., 2020). More detailed issues of quality are explored throughout the synthesis of findings.

What were the core elements of psychological formulations and were these in line with the proposed underpinning theoretical model? Did they have an impact on treatment outcome?

Summary of findings. One CAT paper (Bell, 1999), one CBT paper (Geller, 2006), two MANTRA papers (Allen et al., 2016; Treasure et al., 2019) and one EFT paper (Dolhanty & Greenberg, 2009) described or reported on the core elements of formulations. No papers were found that reported psychological formulations in SSCM or other models.

CBT. A case series based upon CBT and motivational theories described the formulation and reformulated beliefs of two adults with AN (Geller, 2006). The paper described a model of change that included self-perpetuating cycles, core beliefs, and the role of inquiry and experimentation in reformulating these beliefs. The case formulations included beliefs about the self, world, relationships, and AN which informed the beliefs that were targeted in therapy which appeared to be client-led. The formulations appeared to be in line with the model described in the paper and informed treatment accordingly.

MANTRA. One MANTRA paper described formulation and intervention through a case study (Treasure et al., 2019), whilst another paper explored whether formulations adhered to the model and which elements of formulation were related to client satisfaction and symptom reduction (Allen et al., 2016).

Treasure et al. (2019) aimed to demonstrate the importance of involving fathers in care in the treatment of MANTRA. The paper included an example formulation letter and three diagrams: a collaborative diagrammatic 'vicious flower' formulation (see Figure 8); a diagram of predisposing, precipitating and perpetuating factors; and finally interpersonal risk factors. The vicious flower formulation utilised is in line with the MANTRA model and the additional diagrams expand upon the development and understanding of AN.

Allen et al. (2016) found formulations that paid attention to the development of AN predicted higher treatment acceptability ratings by the client. Within the MANTRA model for AN, the formulation was considered an opportunity to summarise current difficulties and maintaining factors, yet attention to maintaining factors did not predict outcomes. Further, the study developed a rating scale (MANTRA Case Formulation Rating Scheme [MANTRA-CFRS]) that explored adherence to the MANTRA model (the development and use of this measure will be discussed later in this review). Scores suggested good adherence to the MANTRA model (Allen et al., 2016). Therefore, although adherence to the model within the formulations was good and maintaining factors were attended to this did not appear to influence therapy outcomes as measured BMI and EDE-Q.

CAT. Bell (1999) explored data from 30 patients' reformulation letters, psychotherapy files, and sequential diagrammatic reformulations to establish presenting problems. From this sample, eight had a diagnosis of AN and it was found that most (n=7) had developed AN as a way of coping with unmanageable feelings of failure, loss, neglect or abandonment. Whilst

there was no consistent pattern between severity of anorexia and the source of the problem in terms of clients' reciprocal roles, of the eight individuals with AN all but one had a reciprocal role procedure relating to ideal care. This highlighted the importance of interpersonal problems in both the development and maintenance of AN and findings supported that both should be considered during formulation. The focus of the formulations in the case series appeared to be in line with the model, however although the model aims to include AN as a target problem this was not found to be amongst the most common problems for clients with AN in this sample.

EFT. The EFT case study (Dolhanty & Greenberg, 2009) focussed on interpersonal themes and the therapist's observation of what happens for the client when the therapist draws the client's attention to their internal experience. Therefore, the formulation appeared to reflect the principles of EFT through the formulation.

Critique. The papers provided interesting insights into the core elements of formulation across different models of AN. The CBT model and maintenance cycles described by Geller (2006) were different from Fairburn's model of eating disorders (2008). Although the beliefs targeted in treatment were informed by cognitive theory, the formulation was not in line with the CBT-E model and no papers that described the core elements of formulation in CBT-E formulations were found. One strength of the paper was that it provided evidence that initial formulation provides a focus of treatment and led to a change in beliefs.

A weakness of the Bell (1999) paper was the small sample size with a lack of clear inclusion criteria and no reporting of demographics or clinical information. This makes the research difficult to replicate. As CAT was not specifically developed for the treatment of AN, and the formulation developed was a generic one it was of interest that ED behaviours were not focussed on in the formulations. Whilst this aligns with previous findings that key

difficulties underlying EDs rarely concern ED-related themes (Sternheim et al., 2012) this makes the approach distinctly different from the other models. This finding could suggest that focus on ED behaviours was not necessary within the treatment of AN, however patient outcomes were not reported in order for this association to be made.

Patient outcomes were also not reported by Geller (2006) and Treasure et al. (2019). This means that initial formulations cannot be triangulated with the core elements focussed on within treatment, post-therapy reformulations, and outcome measures. Therefore, although we can broadly assess whether the core elements of formulation are in line with the model, the utility of the formulation can only be evaluated through the reported re-formulations. Dolhanty and Greenberg (2009) reported improvements on self-report measures of mood and emotional awareness therefore illustrating the application of EFT to an individual with AN through case study methodology.

Within the case study papers, the EFT paper did not include diagrams or letters (as these were not aligned with the model) but reported discourse of therapeutic tasks. The MANTRA formulation (Treasure et al., 2019) was described and jointly produced with the client. This demonstrates how within MANTRA there was an emphasis on motivating the client and working collaboratively whereas within EFT the therapist utilises the formulation to guide the client to focus on their core emotional pain and inform therapy tasks.

Furthermore, Treasure et al. (2019) included the MANTRA 'vicious flower' formulation, as well as two other diagrammatic formulations describing developing/contributing and risk factors. Inclusion of these factors might be beneficial given the finding that formulations that explored the development of AN predicted higher treatment acceptability ratings (Allen et al., 2016), however the paper includes three complicated diagrams developed and shared at the start of therapy and this could be experienced as quite overwhelming by the client.

As engagement improved when formulations included the development of AN (Allen et al., 2016) this could provide reflections for other models. Engaging people with AN in psychological therapies is known to be challenging (Hart et al., 2011) and as interventions primarily focus on maintenance cycles changing this could improve engagement. Further, whilst the formulations demonstrated good adherence to the MANTRA model this did not lead to reductions in EDE scores. This could indicate that the model does not focus on the appropriate developmental or maintenance factors that need to be targeted to lead to change in the treatment of AN.

In summary, there is limited research establishing the core elements of psychological formulation across each theoretical model and demonstrating support of this with outcome measures. Further, where adherence to the model was evaluated, this did not lead to improved outcomes in MANTRA (Allen et al., 2016). Preliminary evidence suggests that a focus on developmental and interpersonal factors could improve engagement in this client group.

Can the process by which formulations are drawn up be understood? What is the client experience of this process?

Summary of findings. Five of the papers commented on the process or experience of constructing the formulation: one CBT paper (Resmark et al., 2018); three MANTRA papers (Treasure et al., 2019; Waterman-Collins et al., 2014; Lose et al., 2014); and one emotion focused therapy (EFT) (Dolhanty & Greenberg, 2009). No CAT papers were found on this topic. Two papers made comparisons between therapist and client experiences of MANTRA and SSCM and formulation was commented on as part of the findings (Lose et al., 2014; Waterman-Collins et al., 2014). Additionally, three papers commented on the use of reformulation as part of the formulation process (Geller, 2006; Lose et al., 2014; Resmark et al., 2018).

CBT-E. Within the Resmark et al. (2018) study, formulation was a compulsory module. Therapists recorded the content of the session on a log sheet at the end of each session. The study reported that formulation worksheets "Family relationships" and "What I have I learnt" were second and sixth most used handouts respectively and formulation accounted for 15% of total CBT-E sessions. The formulation sessions contributed to 21% of the first 16 sessions, 13% of the next 15, and 4% of the final eight. This demonstrated that the formulation was considered throughout the therapeutic process. "What I have learnt" worksheet was utilised towards the end of treatment giving clients the opportunity to reflect on what had changed for them over the course of therapy.

EFT. The steps of case formulation and the tasks of treatment in EFT (Dolhanty & Greenberg, 2009) were outlined using a case study design. The process was described in detail using the eight steps of case formulation (Greenberg & Goldman, 2007), along with reported dialogue. Through understanding the client's style of processing emotions and validation, the individualised treatment focussed on self-criticism, blocking of feelings, and unfinished business with a significant other. Experiential practice is then described to resolve the internal conflict. Unlike in other models the formulation was not directly "shared" with the client through a letter or diagram, however problematic processes were articulated.

MANTRA. Three of the MANTRA papers explored the process and experience of formulating, as well as receiving end of therapy letters, using different methods (Treasure et al. 2019; Waterman-Collins et al., 2014; Lose et al., 2014).

One case study (Treasure et al., 2019) described building a joint understanding of the illness and included a collaborative diagrammatic formulation created by Rose and her therapist. Further, the paper commented that Rose appreciated the formulation letter and recognised that the therapist had listened to her.

Two papers conducted interviews evaluating therapist and client experiences of MANTRA and SSCM (Lose et al., 2014; Waterman-Collins et al., 2014), which provided reflections on the formulation process. Therapists' experiences were reported on by Waterman-Collins et al. (2014) who commented that within MANTRA the formulation section was hard to complete (42%) as the number of maintenance cycles could be confusing. Further, it felt like there was not enough time to work through the factors that had been identified (29%). 29% of therapists felt that having to write a personal formulation and goodbye letter meant there was extra demands on their time, however it was acknowledged formulation letters were a valuable tool and that patients liked them. 93% of therapists reported that there was flexibility within the structure to tailor the treatment to the patient's needs.

Within SSCM (Waterman-Collins et al., 2014) therapists noted that treatment focussed on weight restoration and target symptoms which left therapists feeling that SSCM did not allow them to address psychological difficulties (73%). One individual felt that the formulation didn't guide treatment and that therapists would like the focus of an individualised formulation.

Lose et al. (2014) explored patient experiences of MANTRA and SSCM via a 30-minute interview. Eleven participants completed MANTRA; ten found that developing a psychological understanding of their problem was helpful. Further, formulations and "goodbye letters" were uniformly well received and perceived as personal. The end of therapy letters were thought to be a helpful summary of treatment and could be shared with carers. Six participants were interviewed about SSCM, half of those participants felt that there was a lack of psychological understanding offered and a lack of materials to refer to, whilst an additional participant commented on how a major relationship issue hadn't been thought about as it "didn't come up" as part of the process. In combination with the results

from the Waterman-Collins et al. (2014) study, therapists and MANTRA clients agreed on the importance and value of the formulation and end of therapy letters.

Critique. Within CBT-E, Resmark et al. (2018) demonstrated formulation was being undertaken and considered throughout therapy but there was limited information about the process of constructing the formulation despite this being an aim of the paper. This was due to the categorical nature of the data. Therefore, there was little indication of the process beyond the use of the handouts, for example whether it was collaboratively undertaken with the therapist in session or individually as homework. Additionally, this leaves limited understanding as to whether the formulation informed therapy, for example did the "What I have learnt" worksheet correspond with the original formulation. Finally, client experience of this process was not reported on (Resmark et al., 2018).

The primary aim of the EFT paper was to identify and demonstrate the steps of formulation within EFT (Dolhanty & Greenberg, 2009) which was mapped against the model making it replicable. However, direct feedback was not collected on patient experience of constructing the formulation. The same case study methodology was used by Treasure et al. (2019) who highlighted the collaborative nature of MANTRA, as well as use of diagrams, whilst reporting the client felt listened to by the therapist through letters. Both case studies are of high quality, however case studies are limited in their generalisability due to the small sample size.

Experience of receiving a formulation was reported in the qualitative papers that compared MANTRA and SSCM (Waterman-Collins et al., 2014; Lose et al., 2014). Both papers had strong methodology and therapists and clients felt formulation was valuable for therapy. However, it was not considered how interviewer bias may have impacted the outcomes of the papers or that clients were financially reimbursed.

Other limitations of note included that only 10 of the 20 therapists interviewed had delivered both therapies (Waterman-Collins et al., 2014) and those who had only delivered one were asked about their "expectations of delivering the other therapy". These expectations may have been biased and should not be considered a reliable way of a evaluating a therapy. Additionally, the paper chose to 'oversample' MANTRA participants which leaves possibility for more emphasis on the views and reported findings of MANTRA patients compared with SSCM.

In conclusion, within the case study papers (Dolhanty & Greenberg, 2009; Treasure et al., 2019) the process of constructing the formulation was described in detail and can begin to be understood for EFT and MANTRA. The only papers to explore client and therapist experiences of formulation was within MANTRA and SSCM. Findings showed that although formulations and end of therapy letters can be time consuming for the therapist they are valued by clients (Lose et al., 2014; Waterman-Collins et al., 2014). Reformulation over the course of therapy appeared to be considered across all models discussed, either as a reflection on what has been learnt or uncovered over the course of therapy or a letter from the therapist.

Does the quality of formulation impact intervention outcomes?

Summary of findings. Two papers explored the quality of written formulations (Allen et al., 2016; Gladwin & Evangeli, 2013) within CAT and MANTRA models. One paper evaluated the quality of end of therapy letters within MANTRA (Simmonds et al., 2020). No papers were found that explored this question for CBT-E or other models.

MANTRA. Allen et al. (2016) sampled participants that had remained in treatment long enough for a formulation letter to be written (n=46) from an RCT. The authors developed a seven-item letter measure, MANTRA-CFRS, to rate letters on their adherence to the MANTRA model and style. Baseline patient characteristics did not correlate significantly

with MANTRA-CFRS, but did correlate with five item scores. For example, therapists wrote more empathic formulations when their clients reported fewer close relationships with others. Additionally, formulations with a respectful tone predicted significant improvements in Global EDE scores. It was reported that overall, the quality of formulations was not significantly associated with outcomes or engagement within MANTRA.

End of therapy letters in MANTRA from the same clinical trial were also analysed (Simmonds et al., 2020). Analysis of end of therapy letters (n=41) was conducted using a 7-item goodbye letter rating scheme which was adapted from the MANTRA-CFRS (Allen et al., 2016) with a shift in focus from formulation to goodbye letters. Findings revealed that overall quality of goodbye letters was not associated with reductions in EDE scores at 12 or 24 months. However, higher quality end of therapy letters was significantly associated with BMI at 12 months, although this did not extend to 24 months (Simmonds et al., 2020). Further, on an item-specific level "affirming stance" (praising effort rather than performance) was the only item that was significantly associated with BMI increases at 12 months. This suggests that using an affirming tone in end of therapy letters in MANTRA is important in influencing weight post-treatment.

CAT. Gladwin and Evangeli (2013) used a case series approach to examine the case notes of women who had attended an eating disorders service over a 2-year period (n=14) and received CAT. Case Formulation Content Coding Method ([CFCCM]; Eells et al., 1998) was used to evaluate formulations across a number of characteristics, for example, elaboration of explanatory mechanisms and goodness of fit of formulation to treatment plan. The authors considered the baseline phase to be prior to delivery of the formulation and delivery of the formulation formed the cut-off for the "post-intervention" phase. Five individuals showed increased weight with evidence that this was related to formulation delivery, whilst three participants reduced in weight. Additionally, it was found that participants who did not gain

weight following delivery of the formulation were presented with higher quality formulations. The authors reflected that this might be due to increased effort on the therapist behalf with clients who had low motivation for change, however this was not measured so cannot be assumed. Overall, the study concludes there was no evidence that formulation quality was associated with therapeutic benefit.

Critique. Both MANTRA-CFRS and CFCCM were reported to have good internal consistency and inter-rater reliability within these papers (Allen et al., 2016; Gladwin and Evangeli, 2013; Simmonds et al., 2020). This would suggest that when clinicians are trained in using the measures, they reliably get the same results.

To evaluate formulations the CFCCM content categories were aligned with the common features of formulation described by Johnstone and Dallos (2014). The categories described were symptoms and problems, precipitating stressors, predisposing life events, inferred mechanism, and other content categories. Quality was also evaluated exploring ratings of complexity, degree of inference, and precision of language. In comparison, the MANTRA-CFRS focussed on adherence to model (developmental aspect, maintenance aspect, includes a way forward) and interpersonal aspects of the letter (collaborative stance, respectful of patient's views, affirming stance, compassionate stance).

CFCCM was designed to be applicable across several approaches of psychotherapy (Eells et al., 1998), whilst MANTRA-CFRS was developed solely for the use of MANTRA. Therefore, at this stage it is not known whether MANTRA-CFRS is generalisable to other samples. The focus on adherence to the MANTRA model may have to be adapted for this to be possible. However, a strength of MANTRA-CFRS is the length and usability of the questionnaire, compared with the CFCCM which is intensive (Eells, 2010). It was emphasised that a more practical and efficient tool was required in the evaluation of case

formulations so exploring the utility of MANTRA-CFRS applicability to other formulations and models could be beneficial for extending use into clinical practice.

The MANTRA papers (Allen et al., 2016; Simmonds et al., 2020) used a comprehensive range of outcome measures and compared formulation ratings with improvements in BMI and Global EDE across treatment (Allen et al., 2016) and end of therapy letter ratings at 12- and 24-months post-therapy. Despite no statistically significant relationship being associated with outcome and engagement over the course of treatment (Allen et al., 2016), higher quality end of therapy letters was significantly associated with BMI at 12 months (Simmonds et al., 2020). This could indicate that therapy letters might reflect a transitional object that allows therapeutic benefits to continue after therapy or as an indication of the overall quality of therapy. Further exploration into this is necessary.

It is of note that within formulation letters a reflective and respectful tone was associated with improvements in ED symptomology (Allen et al., 2016) and an "affirming stance" was the only item significantly associated with increased BMI at 12 months (Simmonds et al., 2020). This introduces the idea within the research that the "style" of the formulation may be important to consider, alongside the core elements of the formulation. This suggestion might be in line with broader research on therapeutic alliance which is recognised as a key predictor of therapy outcomes (Allen et al., 2016). However, the samples of the studies were small (n=46, Allen et al. (2016); n=14, Gladwin & Evangeli (2013); n=41, Simmonds et al. (2020)) which limits the possibility of reaching statistical power and finding change. This might explain why only certain items were found to be significant and would suggest that further research should be conducted to explore this.

The time frame used to assess the influence of formulations was different amongst the studies. Gladwin and Evangeli (2013) considered weight (KG) in the session following

delivery of formulation. The findings demonstrated that sharing case formulations can be associated with therapeutic benefit and harm. Some clients might find the formulation triggered intense negative emotions that results in avoidance of eating. It is questionable as to whether formulation should be considered a specific intervention, as the primary purpose of formulations were to inform treatment, and there is limited evidence for this (Cole, Wood, & Splendelow, 2015). Whilst weight gain is an important outcome in AN, it might not be expected that the delivery of formulation would have a positive effect on weight gain, rather that it would inform understanding as to the development and maintenance of the AN.

In conclusion, across both studies exploring the relationship between quality of formulation within CAT and MANTRA (Allen et al., 2016; Gladwin & Evangeli, 2013) no evidence was found that better quality formulations led to improved treatment outcomes. However, a tentative finding supports the use of end of therapy letters in extending benefits of therapy post-intervention (Simmonds et al., 2020). The studies all acknowledge that the causality of the link between formulation and intervention outcomes is unclear (Allen et al., 2016; Gladwin & Evangeli, 2013; Simmonds et al., 2020), despite the agreement that formulation is important. The papers highlight other factors, such as tone and style of formulation, could impact on outcomes. Further studies may benefit in exploring this, as well as additional consideration of covariates (such as therapeutic relationship) in future research.

Discussion

Summary of Results

The purpose of this review was to look at how formulation has been used to inform treatment of AN across different models, offering a critique of the methodological considerations. There has been no previous review focussed on formulation in the treatment of AN. The papers chosen all focussed on formulation although took different approaches to

the methodology, as well as the aims of the papers. Taken together the papers considered content, process, quality, and experience of formulating across different models. Findings drawn from this review should be tentative considering the limited number of relevant papers.

When exploring the core elements of formulations five papers (Allen et al., 2016; Bell, 1999; Dolhanty & Greenberg, 2009; Geller, 2006; Treasure et al., 2019) were found. The core elements of the formulation appeared to be aligned with the corresponding theoretical model, and preliminary evidence suggested that focussing on how the AN developed could improve engagement (Allen et al., 2016) which is known to be challenging within this client group (Hart et al, 2011). As formulation is a collaborative undertaking (Johnstone & Dallos, 2014) this could be an important finding to improve engagement, the formulation process for both client and therapist, and lead to a better understanding of the difficulty, and therefore how to intervene.

Further, current models of CBT and MANTRA focus on the maintenance cycles yet attention to maintaining factors did not predict outcomes in MANTRA (Allen et al., 2016). Therefore, it remains unclear whether the current psychological models for AN focus on the appropriate mechanisms of change, and consequently whether the formulations developed focus on relevant factors in the development and maintenance of AN (Murray et al., 2019; Oldershaw et al., 2019).

All papers that commented on the process of constructing formulations indicated that this was amended or explored over the course of therapy, for example by referring to the original hypotheses, by reflecting on what had changed, or through a goodbye letter written by the therapist. This follows good practice of formulation as potential hypotheses and a process that informs therapy moving forward (Johnstone, 2018). However, there was limited descriptions of how this process took place during therapy across models. One paper (Gladwin &

Evangeli, 2018) explored whether formulation could be considered as a one-off intervention and found this to have mixed results. A previous study into the impact of case formulation on symptoms of anxiety and depression (Chadwick et al., 2003) similarly found a mixed response to formulation. This indicates that the process of formulating can have an emotional impact and should be held in mind throughout the process, providing further support for collaborative development of formulation (Johnstone, 2018) and consideration of how this is communicated. For example, within this review the idea of communication style and use of a reflective tone within formulations as a predictor of outcomes was introduced (Allen et al., 2016).

Papers that commented on the experience of constructing or receiving formulations concluded that overall clients and therapists felt formulations were valued and beneficial (Lose et al., 2014; Treasure et al. 2019; Waterman-Collins et al., 2014) in MANTRA and CAT, and supports previous claims about the value of formulation (Johnstone & Dallos, 2014). However, therapists noted the demands that this placed on their time and the importance to have the time to work on what was discovered in the formulation (Waterman-Collins et al., 2014). There were no CBT-E papers that explored this. Additionally, within SSCM it was felt by both therapists and clients that psychological understanding of difficulties was not focussed on as part of the intervention.

Findings from two papers (Allen et al., 2016; Gladwin & Evangeli, 2013) which explored the quality of formulation on therapy outcomes found that the quality of the formulation was generally not associated with outcomes in MANTRA and CAT. This could indicate that factors beyond the model are important to consider during the formulation process, and potentially supports the idea that the models on which the formulations are based do not have a comprehensive understanding AN. No papers were found on this within CBT-E so this finding cannot be generalised.

In summary, the current review has found that consideration of the development of AN and communication style may be more important when formulating than quality of formulation and model adherence within treatment for AN across the different models. Gaps in the research, implications, and methodological issues will be considered in turn below

Limitations of the Review

Formulation began as a practice-based tool and research has begun to be established over recent years, although gaps in the research remain. Caution should be taken in generalising the results from this review due to the limited number of papers. Whilst it is understandable that the focus of research continues to be surrounding developing effective treatments of AN, developing an understanding of how formulation can be best used could improve treatments as formulation informs therapeutic intervention.

Given the limited evidence base, the exploratory nature of the papers is appropriate. Case studies/series and qualitative research are beneficial within exploratory research; however, the lack of control of other variables can make it difficult to draw definitive conclusions.

The three quantitative papers (Allen et al. 2016; Resmark et al. 2018; Simmonds et al., 2020) included in this review all used data that was taken originally from RCTs. Whilst RCT designs benefit from control groups and researchers and participants were blind to conditions, these papers only partially benefit from this. For example, as the data was analysed once the trial was completed the researchers were aware of what group participants were allocated to and comparison groups were not used. Moreover, only one study conducted a follow-up (Simmonds et al., 2020). Therefore, there is plenty of scope to expand on the existing literature specifically with larger sample sizes and control groups.

It should also be noted that five of the papers included in this review explored formulation within MANTRA (Allen et al., 2016; Lose et al., 2014; Simmonds et al., 2020; Treasure et al., 2019; Waterman-Collins et al., 2014) which skews the findings. Papers on other models were less common meaning that further research needs to be done prior to generalising the results of this review. Further, no papers were found about the use of formulation in FPT (which was included in the NICE guidelines) and so conclusions cannot be drawn in relation to this model.

A strength within the MANTRA research was the development of a measure to explore quality of the formulation and adherence to the model (Allen et al., 2016), which was then adapted to be used with goodbye letters (Simmonds et al., 2020). Whilst broader application of this tools could support the findings of these papers and improve understanding of the relationship between quality of the formulation and therapy outcomes, the tool was developed specifically for evaluation of MANTRA and may need to be adapted to be valid for use with other models.

In conclusion, whilst the published papers have provided some insight into the use of formulation within the treatment of AN there are significant gaps in the research.

Clinical and Research Implications

Given the methodological issues and limited amount of research, caution should be taken prior to making recommendations from this review. Nonetheless, the finding that formulation was valued by both therapists and clients during the treatment of AN emphasises the importance of this aspect in therapy and future research.

Research indicated that formulation should focus on the development of AN in order to engage clients, rather than exclusively focussing on maintenance cycles. Engaging clients with AN is an important part of the therapeutic process and known to be challenging within

this population (Hart et al., 2011). This is something that clinicians could consider during formulation with clients with AN. However, this was only found in one MANTRA paper (Allen et al., 2016), therefore further research would need to be done in order to be able to generalise this across models.

It was indicated that the quality of formulations does not appear to impact therapy outcomes (Allen et al., 2016; Gladwin & Evangeli, 2013) in CAT and MANTRA. This might indicate that other aspects of formulation are beneficial in treatment of AN, such as the process of undertaking the formulation or the way the formulation is communicated. However, further research should be undertaken within this area particularly with larger sample sizes and comparison groups.

Whilst the process of formulating within clinical practice was explored, only EFT specifically detailed the step-by-step process in line with the model (Dolhanty & Greenberg, 2009). Therefore, it remains unclear how formulations are drawn up in different models and whether practice styles of therapists' impact client experience or effectiveness of the intervention. This is a gap in the literature that should be explored in the future. Larger scale studies exploring the process of constructing formulations within therapy, across models, utilising a comparison group would help inform clinical practice in the future. Further, how this is experienced by clients could lead to a better understanding of the usefulness of the process and would benefit future clinical practice.

Findings suggested that how formulations are communicated with clients, for example, with a respectful tone (Allen et al., 2016), was an important part of the process as this impacted post-treatment scores. Whilst we would hope that therapists would aim to communicate respectfully with clients this finding suggests with this client group this could be especially important. This finding could inform how supervision is facilitated and ensure

that this continues to be held in mind. Further research into interpersonal aspects of formulation could benefit clinical practice.

Considering the above, whilst SSCM is recommended in the NICE guidelines for treatment of AN it does not involve constructing an individualised formulation. Therefore, the client's goals for therapy should be considered alongside explanation of the different approaches offered and enabling patient choice. If the client would like to gain a psychological understanding of their difficulties, then SSCM might not be the recommended intervention.

Given that the NICE recommended interventions described in this review aim to disrupt maintenance cycles as theorised by their respective models, limited support has been found demonstrating this improves outcomes. Further research developing and refining psychological models of AN will be necessary to ensure that the correct mechanisms are identified. Further, this could improve guidance and inform policy in the treatment of AN.

Conclusion

This review considered ten papers exploring different aspects of formulation in the treatment of AN across different models. There is a growing body of research evaluating the process of formulation, specifically within MANTRA. Overall, the evidence indicates that formulation is valued by therapists and clients however further research needs to be conducted on how formulations are developed, shared, and used across the models. The findings are limited by the amount of research that has been undertaken and the methodological issues identified. Therefore, future research should continue to explore the questions posed in this review and consider whether current models of AN identify the appropriate factors for formulation to facilitate clinical change.

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Major Research Project

Section B: Empirical Study

Schema modes as a predictor and mechanism of change for adults with Anorexia Nervosa

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For submission to the International Journal of Eating Disorders

SALOMONS

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Abstract

Objective: The aim of this study was to understand which schema modes are utilised by people with Anorexia Nervosa, and how they experience the modes. Further, to explore whether increasing the role of the Healthy Adult relates to improvements in clinical outcomes.

Method: 26 individuals with Anorexia Nervosa who undertook the SPEAKS therapy feasibility trial consented to share their formulations in this study. They also completed questionnaires relating to schema modes, AN beliefs and behaviours, and BMI.

Results: This study explored SMs in both formulations and questionnaire data of people with AN. SMs endorsed in formulations and on the questionnaire were aligned, and experiences of the SMs supported previous literature. The findings suggest that participants had high levels of Critic Modes.

Results suggested that acting on Angry Child Modes leads to feelings of guilt and shame which could negatively predict outcomes. SPEAKS therapy improves the presence of the Healthy Adult and in turn predicts fewer ED thoughts and behaviours post-therapy. Clinical and theoretical implications are considered.

Conclusions: The findings support the premise that the Healthy Adult is a mechanism of change and should be identified and built during therapy for AN. Working with the Angry Child modes is important in therapy as the mode can negatively predict outcomes.

Keywords: Eating Disorders, Anorexia Nervosa, Schema Therapy, Schema Modes, Healthy Adult

Introduction

Schema Therapy and Anorexia Nervosa

Schema Therapy (ST) blends elements from cognitive-behavioural treatments (CBT) with attachment, object relations, and psychoanalytic thinking into one treatment model and is thought to be suited to patients with severe and enduring psychological disorders (Young et al., 2006). Systematic reviews have shown growing empirical support for ST (Bakos et al., 2015; Masley et al., 2011), including interest in ST for chronic psychological disorders, such as personality disorders (Arntz et al., 2022), chronic anxiety, and PTSD (Peeter et al., 2022).

Anorexia Nervosa (AN) is an eating disorder (ED) with poor prognosis and the highest mortality rate of any psychiatric disorder (Hay et al., 2015). CBT adapted for Eating Disorders and Maudsley Anorexia Nervosa Treatment for Adults (MANTRA) are currently recommended for treatment of Anorexia Nervosa (NICE, 2020), however outcomes have been found to be inadequate hence a growing interest in the use of ST (Pugh, 2015).

The theory of ST for AN emphasises the role of schemas in the development and continuation of EDs (Ansari et al., 2020). Early maladaptive schemas (EMs) are thought to develop in childhood as a consequence of unmet core emotional needs and are accurate reflections of the environment they experienced (Young, 1994). Evidence suggests that individuals with AN are more likely to have experienced childhood physical, emotional, or sexual abuse and that parental bonding and early attachment have been shown to mediate the relationship between EMs and ED symptoms (Simpson et al., 2018). However, in adulthood schemas are applied in contexts where they are no longer accurate and lead to maladaptive coping styles (Ansari et al., 2020; Young et al., 2006). Schema modes (SMs) are a number of interacting ‘parts’ or ‘modes’ (Pugh, 2015) that make up the “self” and represent moment-to-moment states and coping responses (Simpson et al., 2018). They are informed by early maladaptive schemas.

Research has consistently found that individuals with EDs exhibit more severe maladaptive schemas than controls, which increase with severity of the disorder (Simpson et al., 2019). Whilst it is thought that severity of early maladaptive schemas leads to worse therapeutic outcomes (Simpson et al., 2019) it is unclear whether schema change facilitates positive treatment response (Pugh, 2015). Inconsistent findings have led to an understanding that early maladaptive schemas are not sufficient in predicting ED pathology (Simpson et al., 2019). It is hypothesised that early maladaptive schemas are fixed structures which become repressed during recovery whereas schema modes are state constructs that may better reflect the change process (Ansari et al., 2020). Therefore, research has begun to investigate the role of SMs in the development and maintenance of EDs (Simpson et al., 2019).

Schema Modes

Simpson (2012) suggested that EDs are characterised by overactive schema coping modes. The identification and analysis of SMs is thought to be a basis for formulation, however whilst phenomenologically distinct, modes may "blend" or "sequence" which can make them difficult to identify (Edwards et al., 2022).

SMs are traditionally grouped into four main categories: Child Modes, that represent the emotions experienced in the context of unmet needs; Critic (sometimes known as Parent or Internalised) Modes, which represent internalised messages from childhood, including parents, teachers, and other caregivers; (Maladaptive) Coping Modes, which are survival strategies developed to cope with unmet emotional needs; and Adaptive (Healthy) Modes (Simpson et al., 2018). The original research by Young et al. (2003) identified a small number of modes but as research into this area has advanced this number has increased. This paper will go on to describe the modes that are thought to be most prevalent within EDs (Simpson et al., 2018).

Child Modes

The Child Modes are considered to be innate, and representative of the emotions experienced in the context of unmet needs (Simpson et al., 2018). *The Vulnerable Child* reexperiences states of vulnerability related to early life experiences (Edwards, 2022) and believes that nobody will fulfil their needs which leads them to feeling pervasively unsafe and mistrusting of others (van Genderen et al., 2012). *The Angry Child* responds with anger to the belief that their needs are not being met, whilst the *Enraged Child* can lose control (might lash out or hurt others) when they feel this way (van Genderen et al., 2012). *The Undisciplined Child* and *Impulsive Child* were conflated by Young et al. (2003) however represent different states (Edwards, 2022; Lobbestael et al., 2007). The Undisciplined Child cannot motivate themselves to finish tasks and cannot tolerate feeling frustrated (van Genderen et al., 2012). Whereas the Impulsive Child lacks self-control and requires immediate pleasure without concern about the consequences (Edwards, 2022).

Maladaptive Coping Modes

These modes are thought to help manage or reduce the emotional distress experienced by the Vulnerable Child (Edwards, 2022). Although these modes were helpful when the client was young, they are not adaptive responses to the clients' current experiences and can lead to secondary emotions as a consequence of blocking the core pain (Young et al., 2006; Edwards, 2022). Therefore, they are considered maladaptive. These modes are usually grouped into three further categories: Detached, Overcontroller, and Surrender.

Detached modes aim to protect the Vulnerable Child through avoidance (Young et al., 2006). This could be by emotional and social withdrawal which could lead to the individual feeling numb (*Detached Protector*) or through activities that that soothe or distract from

emotional distress (*Detached Self-Soother*) because they believe that intense emotions are dangerous (van Genderen et al., 2012).

Overcontroller (sometimes known as Overcompensation) modes behave in opposition to the early maladaptive schema that has been activated and attempt to maintain self-control or predictability to protect themselves from perceived threat (Edwards, 2002). One mode that has been identified within the ED population is the *ED Overcontroller*, which is thought to be an extension of the *Perfectionistic Overcontroller* (Edwards, 2022). The Perfectionistic Overcontroller attempts to keep control by maintaining "perfection", whereas the Eating Disorder Overcontroller focusses on unrealistic rules that maintain low body mass and thinness, as well as other ED behaviours (Simpson et al., 2018). Other modes in this category include the *Self- Aggrandiser* who believes they are superior to others and behaves in a grandiose way and the *Bully and Attack* who can attack or threaten others to prevent being hurt or controlled themselves (Edwards, 2022; van Genderen et al., 2012).

Surrender modes are thought to accept the underlying schema and act in way that is dependent and passive as they want to maintain connection and avoid conflict (Edwards, 2022; Young et al., 2006). This could be by doing whatever other people want them to do, known as the *Compliant Surrender*, or behaving passively and avoiding directly expressing their emotional needs whilst simultaneously feeling dependent on others, known as the *Helpless Surrender* (Lobbestael et al. 2007; Edwards, 2022 Simpson et al., 2018).

Critic Modes

The Critic Modes (or Inner Critic Modes; Simpson, 2022) are thought to be the internalised attitudes and behaviours of caregivers from the clients' early life when the child's core needs were not met. Client's then unconsciously assimilate these attitudes and treat themselves in the same way when these modes are activated (Young et al., 2006;

Simpson, 2022). This means the patient could feel that whatever they do is not good enough and they must try harder (*Demanding Mode*) or that they should be punished for their mistakes (*Punitive Mode*) (van Genderen et al., 2012).

Healthy Adult

The Healthy Adult mode is adaptive, has healthy coping mechanisms, and behaves in ways that are helpful leading to them having healthy relationships and functioning (Simpson et al., 2018; van Genderen et al., 2012). Research suggests that the Healthy Adult mode is a transdiagnostic mode (Bach and Bernstein, 2019) and embodies a capacity to reflect, take responsibility, connect and tolerate emotions, has a coherent sense of identity, and ability to be compassionate to themselves and others (Edwards, 2022).

Schema Modes in Anorexia Nervosa

Preliminary research has shown individuals with ED tend to rely on maladaptive schema modes more frequently, and the Healthy Adult less frequently, when trying to manage the intense emotions that are experienced when EMs are activated (Nesci et al., 2014; Simpson, 2012; Talbot et al., 2015; Voderholzer et al., 2014). This might look like the maladaptive coping modes, such as the Detached Protector, coming forward to manage distress by withdrawing from the emotion or circumstances which have activated the Child Modes, or the internal attacks from the Critic Modes (Corstorphine, 2008; Simpson, 2012). Secondary emotions may then arise from utilising a coping strategy that is no longer helpful. This may be more common when there is an absence of a Healthy Adult to regulate and express emotional experiences (Edwards, 2022).

For individuals with AN, the Vulnerable Child, Compliant Surrender, Detached Protector, Detached Self-Soother, Demanding and Punitive Critic modes were all found to be significantly higher, and the Healthy Adult was found to be significantly lower, than the

community sample (Talbot et al., 2015). These results are partly supported by Nesci et al. (2014) who reported significantly higher Critic Modes in an inpatient AN sample compared with individuals with a diagnosis of personality disorder and healthy groups.

One case study analysed the SMs of a young woman with AN (Edwards, 2017a; Edwards, 2017b) and drew parallels with and support for the ST mode model. The idiosyncratic nature was emphasised, as well as themes highlighting mode conflicts, differentiation, and sequences. This provides initial empirical support for schema mode models of ED, however there is little exploration into the prevalence and pattern of schema modes used by individuals with AN. Therefore, further research is needed into which modes are utilised by people with AN and how they experience those modes given their personal nature.

Schema Modes as a Mechanism of Change

Research is beginning to consider that SMs may be appropriate to work with in therapy as they represent how clients are feeling and responding to circumstances which may provide insight into how EDs developed and are maintained (Ansari et al., 2020; Simpson et al., 2019). Additionally, SMs are thought to be easily recognised both in and out of therapy which will allow clients and therapists to build personalised formulations based on individual needs (Bach & Bernstein, 2019; Oldershaw & Startup, 2020). Further work needs to be undertaken to understand these processes within AN, including into clients' lived experience of SMs and associated processes.

It is thought that increasing the role of the Healthy Adult mode through therapy could be essential to positive therapy outcomes within AN (Bach & Bernstein, 2019; Oldershaw and Startup, 2020). This would increase the individual with AN's awareness of emotions and

improve evaluation of situations which then allows them to express and respond to their emotions appropriately (Ansari et al., 2020; Oldershaw et al., 2019).

A feasibility trial (Specialist Psychotherapy with Emotion for Anorexia in Kent and Sussex [SPEAKS]) (Oldershaw et al., 2022) researching building the Healthy Adult in this client group (Oldershaw & Startup, 2020) is underway. This provides an opportunity to explore whether increasing the role of the Healthy Adult relates to improvements in clinical outcomes as hypothesised.

Research Questions

Research Question 1. Which are most endorsed schema modes for adults with AN, how are the modes experienced, and how do they relate to clinical outcomes?

Research Question 2. Does SPEAKS therapy build the Healthy Adult SM, and does this relate to clinical change?

Method

Ethics

Approval for the project was granted by the appropriate NHS Trust (see Appendix B) and Salomon's Institute for Applied Psychology. Risk to the participants was minimised as they were treated within established ED services with access to medical and multidisciplinary team support. Physical health checks remained the same as if they received treatment as usual and if a person's health deteriorated individualised care planning would proceed as normal. In terms of data collected, formulations were already being developed as part of the therapy and questionnaires were already being completed as part of the larger trial. Guidance related to quality improvement methods were followed and all data were stored in line with the Trust guidelines (British Psychological Society [BPS], 2017).

Participants

Consecutive referrals to specialist outpatient ED services were assessed for inclusion and exclusion criteria by *All Age Eating Disorder Service* in Kent and *Sussex Eating Disorder Service.* The inclusion and exclusion criteria were considered with the Research Steering Group which includes people with a history of anorexia. Potential participants were contacted if at assessment they:

1. Met the Diagnostic and Statistical Manual V Criteria for Anorexia Nervosa or OSFED (Other Specified Feeding or Eating Disorder) of Anorexic type.
2. Were aged 18 or over.
3. Had BMI of >15kg/m2 or above and currently stable in weight (i.e. not dropping more than 0.5kgs a week)
4. Had sufficient English language abilities to complete a talking therapy

Participants were excluded if they were:

1. Presenting with considerable physical risk or psychological risk, including active suicidal thoughts and plans.
2. Had a comorbidity that would take priority for treatment.
3. Alcohol/substance dependent.
4. Participating in another treatment trial.
5. Diagnosed with a learning disability.
6. Pregnant.

Design and Procedure

The project was part of a larger feasibility trial of the SPEAKS intervention (Oldershaw et al., 2022). SPEAKS was an individual outpatient psychotherapy for adults with AN of around 12 months' duration involving weekly individual sessions (see Table 1) and was offered as a direct replacement for psychotherapy a usual. All participants were provided with

Table 1

Overview of SPEAKS Therapy (Oldershaw et al., n.d.)

Phase	Content
1. Making contact and building a narrative	Building empathic therapeutic relationship Learning about clients' inner world and core relationships Enhancing curiosity and motivation for change Exploring a narrative of anorexia and its meaning Representing formulation (drawing out/using toys)
2. Connecting with presenting emotion	Connect and work with secondary guilt and shame Client to pay attention to the critical/demanding parts in and out of sessions Reduce blocks to emotion process work Emergence of meaning of attachment fears
3. Resolution of primary emotion processes	Understanding primary stuck attachment fears and linking this with ways of relating (linked to narrative or formulation) Deepening to connect with, express, and transform primary emotions Healthy adult beginning to emerge
4. Resilient and integrated self (Healthy Adult)	Greater integration of parts of self and stronger expression of healthy adult Loosening grip of ED, letting go of old patterns Healthy adult exploring ways to get needs met in adaptive ways
5. Consolidation and ending	Working towards ending Clear indication of Healthy Adult acting on emotional information and associated needs

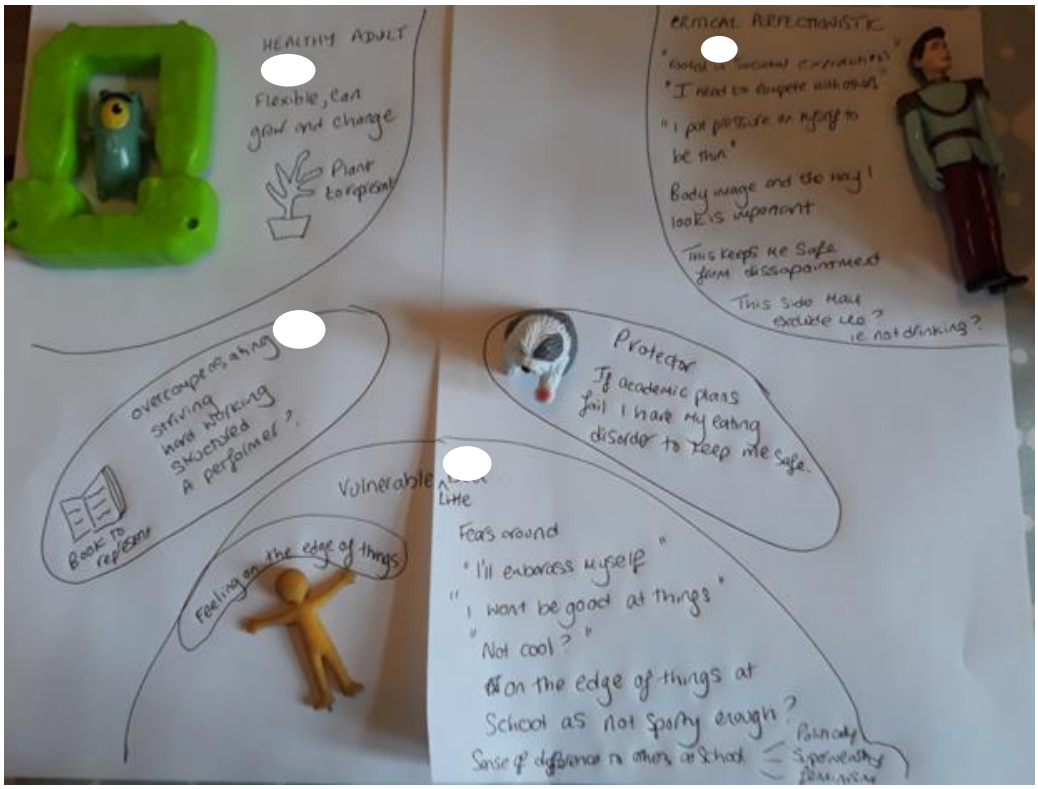
an information sheet (see Appendix C) and consent forms (see Appendix D). Out of thirty-four people who were approached, twenty-six adults provided informed consent for their

formulations and measures to be analysed for this project (76.5% response rate). All identifying information was removed, pseudonyms were allocated, and participants were informed that they could withdraw consent at any point without providing reason or affecting subsequent care.

Baseline quantitative measures were obtained after informed consent was gained and collected at 3-month intervals throughout the intervention. In the initial phase of SPEAKS, the therapist and client constructed a narrative of AN, identifying different schema modes and client's experience of each mode, including a toy to represent the mode. Although within

Figure 1

Pre-therapy formulation map - Layla



therapy idiosyncratic mode names meaningful to clients were developed between the client and therapist, for the purpose of analysis these names were mapped onto SM names established within the literature.

Within the initial phase of therapy, SMs were ‘mapped out’ onto an individualised ‘parts of self’ (mode) map, using the names and/or toys chosen by the patient to construct their map (see Figure 1). This was further elaborated and understood throughout therapy and revisited at the end of therapy by updating the mode map and adding reflections to descriptions of the schema modes.

A mixed-methods design was used with qualitative data analysed first to avoid being influenced by the outcomes of the quantitative analysis. The narratives (n=20) and photographs of the formulation maps (pre-therapy [n=24], post-therapy [n=21]) were submitted by therapists for qualitative analysis. There were less post-therapy formulations as the trial was still ongoing at the stage of data analysis. Photographs of toys chosen were also provided (n=10).

Measures

Qualitative (formulation maps, narratives, and toys) and quantitative measures were analysed pre- and post-intervention, in line with the time points available of qualitative data. Quantitative measures are listed below.

Schema Modes

Schema Mode Inventory for Eating Disorders (Short Form) (SMI-ED-SF). The Schema Mode Inventory (Young et al., 2007) was created to measure SMs and adapted to increase the relevance of the measure for an ED population (Simpson et al., 2018). This measure was then shortened to the SMI-ED-SF (Simpson et al., 2019; Appendix E). It is a 64 item self-report measure on Likerts scale from 0 (never or almost never) to 5 (most of the time). The measure distinguishes 16 SMs with higher scores on each specific subscale associated with a more frequent manifestation of the SM. An overview of the modes measured by the SMI-ED-SF is presented in Table 2. This measure has been validated,

including in other languages (Italian; (Pietrabissa et al., 2019) and been found to have good internal consistency (Simpson et al., 2018).

Table 2

Table of schema modes measured by SMI-EDSF.

Mode Type	Schema Mode
Child Modes	Vulnerable Child
	Angry Child
	Enraged Child
	Impulsive Child
	Undisciplined Child
Critic Modes	Punitive Mode
	Demanding Mode
(Maladaptive) Coping Modes - Surrender	Compliant Surrenderer
	Helplessness Surrenderer
(Maladaptive) Coping Modes - Detached	Detached Protector
	Detached Self-Soother
(Maladaptive) Coping Modes - Overcontroller	Self-Aggrandizer
	Bully and Attack
	Eating Disorder Overcontroller
Healthy Modes	Healthy Adult
	Happy Child

Clinical and functional outcomes

Eating Disorder Examination Questionnaire (EDEQ). EDE-Q (Appendix F) is a 28 item self-report measure that measures the range and severity of ED features over a 28-day period (Fairburn & Beglin, 2008). It calculates a Global score and four subscales: Restraint, Shape Concern, Weight Concern, and Eating Concern. It is scored on a seven-point Likert scale, ranging from 0-6, with higher scores indicating greater symptom severity. It has been found to have strong internal consistency and test re-test reliability (Rose et al., 2013),

although the factor structure of the 4 subscales has not been widely supported (Allen, Byrne, Lampard, & Watson, 2011; Peterson et al., 2007).

Clinical Impairment Assessment (CIA). The CIA (Appendix G) is a 16-item self-report measure that determines impairment in areas of life that are typically affected by ED symptoms such as, mood and self-perception, cognitive functioning, interpersonal functioning, and work performance (Bohn et al., 2008). It provides a single index of the severity of psychosocial impairment secondary to eating disorder features with higher scores indicating greater impairment. The CIA was designed to be completed following a measure of current ED features, such as the EDE-Q. The measure has demonstrated good internal consistency, reliability, and validity, across a range of different samples (Jenkins, 2013).

BMI. BMI was calculated using the standard formula (weight [kg]/height [m]2).

Data Analysis

Qualitative

SPEAKS pre- and post-formulation maps and narratives were provided by the therapists of clients who had agreed to take part in the study. The idiosyncratic mode names provided by the clients and therapist in the formulations and narratives were mapped onto the SMs established within the literature using the descriptions provided. The toys that were chosen to represent each SM were categorised by SM and counted. Data from the SM maps and narratives for each participant were entered into a Microsoft Excel spreadsheet including client pseudonym, therapist and client SM name, corresponding SM, description and/or observations on mode positioning on the map. All data were recorded for each client.

Once data entry was complete, content analysis was utilised to determine the presence of themes within the descriptions as informed by Krippendorf (2004). Units were defined based

on meaning, this allowed participants to contribute multiple times to the analysis if they mentioned more than one theme.

To create a coding frame for each SM a deductive approach was adopted; existing theory was used to identify key concepts of each SM as initial coding categories (Hsieh & Shannon, 2005). These initial codes for each SM were then used to categorise the pre-and post-therapy data against this coding frame. Data at both timepoints were coded as the experience of each mode was not expected to change over the course of therapy, although the individual may find that they spend less time in that mode or are better able to manage when they recognise a maladaptive mode. As research into the experience of SMs within AN was relatively new, it was ensured that when data did not fit into any of the categories, new categories were formed from emerging themes. The formulations and narratives were reviewed multiple times and some categories were collapsed to ensure that they were mutually exclusive and exhaustive (Bauer, 2000).

Two further coding frames were created to focus on narratives concerning interactions between the SMs, and change in presence and positioning of the Healthy Adult over therapy, as provided in the pre- and post-therapy maps and narratives. An inductive approach was used for these frames which allowed categories and names for categories to flow from the data (Hsieh & Shannon, 2005). Categories were established following examination of the data, data were able to contribute to more than one unit, and categories were collapsed when necessary.

Quantitative

To triangulate the qualitative data, quantitative data was analysed. Descriptive statistics were used to explore the demographics of the sample (see Table 3) and to report on pre- and post- therapy scores from outcome measures (see Table 4). SM counts from within SPEAKS

formulations were aggregated and the proportion of clients who endorsed that mode pre- and post-therapy was calculated. Mean ratings of pre- and post-therapy schema modes from the SMI-ED were also calculated.

The Statistics Package for the Social Sciences (SPSS, version 27) was used to perform regression analyses. Data were screened to ensure that the assumptions of multiple regression analysis were met. This involved, multicollinearity, homoscedasticity, independence of residuals through Durbin-Watson tests and assessment of histograms and skewness and kurtosis to ensure normal distribution. These assumptions were not violated.

Exploratory forward forced entry linear regressions were used to determine which pre-therapy SMs were possible predictors of post-therapy EDE-Q, CIA, and BMI. In line with research question 1, baseline SMs as measured by the SMI-ED-SF will be entered into individual regression models. After considering various approaches, this approach was taken as the number of observations should be larger than the number of predictors in the model, in this instance analysis was limited by the sample size. Further, whilst there was existing theory to support exploration of some modes over others, this theory is limited within people with AN; however, the research questions and associated hypotheses were driven by the SPEAKS model theory (Oldershaw et al., 2019; Oldershaw & Startup, 2020).

A model was built for each dependent variable. Whilst unable to prove causation, regression analyses provide greater clarity to relationships between variables as researchers can control other factors, to see if one variable predicts another (e.g. if Healthy Adult predicts EDE-Q global post-therapy when controlling for baseline scores). Therefore, the term predictor is used to indicate a statistical relationship.

To test research question 2, and to establish whether there was a significant increase of the Healthy Adult SM as rated by the SMI-ED-SF over the course of therapy, a within-

subjects t-test was performed comparing pre- and post-therapy EDE-Q and CIA scores. A forward regression was subsequently used to consider whether the Healthy Adult SM related to clinical and functional severity. A residualized change approach (Castro & Grimm, 2018) was used to analyse whether entering the Healthy Adult into the model predicted change in EDE-Q, CIA, and BMI. Baseline dependent variable scores were entered into the model first, followed by post-therapy Healthy Adult scores from the SMI-EDSF. The residualized change in the fit of the model was then reported.

Power Calculations. As the project was part of a larger feasibility trial, sample sizes must balance precision with unethical exposure of participants to the risks (Billingham, Whitehead & Julius, 2013). A post-hoc calculation estimated that with the current sample (n=26) the power of the multiple regressions were very low ($\beta = .30$) This means that there was an increased chance that the small sample will lead to a type 2 error might be made (a null hypothesis that is incorrect will be accepted).

Quality assurance

Inter-rater reliability

Inter-rater reliability was confirmed by a second-rater who used the codebook (see Appendix H) to code a sample of the data (N=30). Inter-rater reliability (κ=.82 (95% CI, .675 to .983), $p<.001$) indicated 'substantial agreement' between raters (Landis & Koch, 1977). Codes and final themes were discussed with supervisors.

Reflexivity

Qualitative data was developed within therapy sessions between client and therapist, this was then coded by the researcher. The researcher's own experiences, judgements, and beliefs were considered throughout the process. Further, supervision of the project was provided

ensuring this was held in mind, the researcher sought to remain as curious as possible about the data provided.

Results

Demographics

Table 3

Participant Demographics

		N	%
Gender	Female	25	96%
	Male	0	0%
	Non-Binary	1	4%
Ethnicity	White-British	22	85%
	Mixed - White & Black Caribbean	1	3.84%
	Mixed - Any other mixed background	2	7.69%
	Not provided	1	3.84%
Age (When intervention began)	18-24	9	34.62%
	25-30	6	23.07%
	31-37	7	26.92%
	38-44	3	11.54%
	45-51	1	3.84%
	Range	19-47	

Descriptive Statistics

The means for EDE-Q and CIA were lower after therapy than before therapy indicating improvements in symptom severity over treatment. Pre-treatment EDE-Q scores were ≥4 which is interpreted as being within the clinical range (Mond et al., 2006), and reduced to 2.74 post-treatment which is below the cut-off. The pre-treatment CIA scores reduced but remained within the clinical range (≥0.33) (Bohn et al., 2008). BMI scores were higher after therapy and the mean score was in the “healthy weight range” (see Table 4).

Table 4

Descriptive statistics of EDE-Q global, CIA, and BMI pre- and post-therapy

	Pre		Post	
	Mean	SD	Mean	SD
EDE-Q Global	4.05	1.15	2.74	1.61
CIA	2.01	0.55	1.17	0.84
BMI	18.21	1.88	19.62	2.32

1. Which are the most endorsed schema modes for adults with AN, how are the modes experienced, and how do they relate to clinical severity?

1.1. What are the most endorsed schema modes for people with AN?

Pre- and post-therapy formulation maps and narratives were analysed for each participant. Parts of self were categorised into SMs based on descriptions in the literature (Edwards, 2022). In order to organise and rank the SMs in the Tables 5 and 6, modes were grouped under the broad classification of mode categories: Healthy Adult; Child modes; Critic modes; Avoidant modes; Surrender modes; and Overcompensator modes.

Table 5 lists the modes identified from the formulation maps and narratives. Thirteen modes were established in total, and two modes were coded from the formulations that were not included in the SMI-ED-SF: Perfectionistic Overcontroller and Avoidant Protector. Analysis revealed that the most commonly endorsed SMs prior to therapy were Vulnerable Child (85%), Demanding Critic (81%), and ED Overcontroller (77%). Post-therapy 100% of individuals included a Healthy Adult (compared with 58% pre-therapy) and a Vulnerable Child within their formulations, and the presence of Critic and maladaptive Coping Modes had decreased.

The SMI-ED-SF was completed pre- and post-therapy SMs (Table 6). The SMI-ED-SF measured sixteen modes in total, this included three Child Modes that were not observed in

the formulations (Undisciplined Child, Enraged Child, and Impulsive Child), as well as an additional Critic Mode (Punitive Mode) and Overcompensator Mode (Self-Aggrandiser).

Table 5

Count from formulations- SM, No. of P's, and percentage who endorsed that part at the start of therapy and end of therapy

	Pre-therapy N=26				Post-therapy N=21		
Mode Category	SM	N	%	Mode Category	SM	N	%
Healthy Adult	Healthy Adult	15	58%	Healthy Adult	Healthy Adult	21	100%
Child Modes	Vulnerable Child	22	85%	Child Modes	Vulnerable Child	21	100%
	Angry Child	7	27%		Angry Child	4	19%
	Happy / Playful Child	3	12%		Happy / Playful Child	1	10%
Critic Modes	Demanding Critic	21	81%	Critic Modes	Demanding Critic	16	81%
Detached / Avoidant Modes	Detached Protector	15	60%	Detached / Avoidant modes	Detached Protector	9	38%
	Detached Self-Soother	9	35%		Detached Self-Soother	4	19%
	Spaced-out Protector	7	27%		Spaced-out Protector	4	24%
Surrender Modes	Compliant Surrender	16	62%	Surrender Modes	Compliant Surrender	9	43%
	Helpless Surrenderer	5	19%		Helpless Surrenderer	4	24%
Overcontroller Modes	ED Overcontroller	20	77%	Overcontroller modes	ED Overcontroller	11	57%
	Perfectionistic Overcontroller	12	46%		Perfectionistic Overcontroller	7	38%
	Bully	3	12%		Bully	3	14%

Pre-therapy the most endorsed SMs were Demanding Critic, Compliant Surrender, and Detached Self-Soother. Bully and Attack was the least endorsed SM from both the formulations (see Table 4) and SMI-ED-SF. Means scores for adaptive SMs (Healthy Adult

and Happy Child) increased from the start of the therapy, whereas mean scores for other SMs decreased following therapy.

Table 6

Mean rating of SM's on SMI-EDSF pre- and post-therapy

Mode category	Schema mode	Pre	Post
Healthy Adult	Healthy Adult	2.38	2.85
Child Modes	Vulnerable Child	3.04	2.07
	Happy Child	2.13	2.76
	Angry Child	1.87	1.38
	Undisciplined Child	1.59	1.28
	Enraged Child	1.56	1.08
	Impulsive Child	1.56	1.08
Critic Modes	Demanding Critic	3.82	2.88
	Punitive Mode	2.18	1.44
Detached Modes	Detached Self-Soother	3.12	2.26
	Detached Protector	2.56	1.65
Surrender Modes	Compliant Surrender	3.43	2.40
	Helpless Surrenderer	2.57	2.10
Overcontroller Modes	Eating Disorder Overcontroller	3.03	2.33
	Self-Aggrandiser	1.93	1.48
	Bully and Attack	0.85	0.45
	Mean	2.31	1.80

1.2. How were the descriptions provided of the part similar between participants and what does this tell us about the part of self and the client's experience of it?

To gain a more in-depth understanding of client's experience of each SM, descriptions were taken from the formulation maps and narratives of each mode. These were then coded, and themes created.

Healthy Adult. The Healthy Adult was experienced as the part where clients could connect with their emotions. The most frequent themes that arose for the Healthy Adult were "Emotional connection and tolerance" (67%) and "Capacity for taking responsibility" (48%) as show in Table 7. The change in endorsement of Healthy Adult from before therapy to after therapy will be commented on later in the results section under research question 2.

Table 7

Themes, No. of P's, percentages, and examples that arose from descriptions of Healthy Adult

SM	Theme	*N*	%	Example Quote
Healthy Adult N=21	Emotional connection and tolerance	15	67%	I can sit with feelings and allow myself to feel them and accept them
	Capacity for taking responsibility	10	48%	A greater sense of being assertive as a way of trying to get her needs met in
	Mature / dependable	7	33%	Calm, confident, strong, reliable
	Alternative perspective	5	24%	Can offer an alternative perspective
	Desire for change	4	19%	Flexible, can grow and change
	Authentic	4	19%	She is value driven
	Hope	3	14%	Showed hope for a different future
	Needs nurturing	3	14%	Can I express these to enable me to have future close relationships?
	Sets boundaries	2	10%	Wants to set boundaries with others

Child Modes. When describing the Vulnerable Child "Core pain" was the most common theme (see Table 8), alongside feelings of shame as captured by the themes "Inadequate/Worthless" and "Isolated/lonely".

Five themes relating to the experience of the Angry Child arose. The most common themes reflected client's assertions that this part was "Angry about unmet needs" and that

when they act on these feelings that it “Leads to guilt and shame”. All participants who identified a Happy Child felt that this was “Suppressed” at the start of therapy.

Table 8

Themes, No. of P’s, percentages, and examples that arose from descriptions of the Child Modes

SM	Theme	*N*	%	Example Quote
Vulnerable child N=22	Core pain	10	45%	A really painful place to go
	Inadequate and/or worthless	8	37%	Made to feel inadequate and worthless
	Isolated and/or lonely	7	32%	Isolated, not connected, lonely, not heard, not believed
	Unmet needs	6	27%	Involves recognising all those unmet needs that even to this day I long to be met
	Feels incapable	3	14%	Hard to trust myself to make positive decisions and action
	Hides emotion	2	9%	Smiling to the world and having to show positivity
	Vulnerable	2	9%	So vulnerable
Angry child N=7	Leads to guilt and shame	4	57%	Typically provides 'a quick fix' but usually results in high levels of shame
	Angry about unmet needs	4	57%	Cross when needs not met
	Directed at self	3	43%	Self-harm and eating behaviours
	Directed at others	2	29%	Push others away
	Misunderstood	1	14%	Always being misunderstood by others
Happy child N=3	Suppressed pre-therapy	3	100%	Suppressed
	Playful	2	67%	Likes to have fun and be playful

Critic Modes. From the descriptions of the Demanding Mode, the most common theme was “Critical” (see Table 9). Further, the mode was experienced as “Deceptive and punitive” (38%), and two individuals recognised this part to be the voice of a parent or caregiver.

Table 9

Themes, No. of P's, percentages, and examples from descriptions of Demanding Mode

SM	Theme	*N*	%	Example Quote
Demanding Mode N=21	Critical	8	38%	Tells me I'm not good enough
	Deceptive and punitive	8	38%	Punitive in its criticisms, aggressive tone and very blaming language
	Relentless	7	33%	Takes over parts of your brain
	Unhelpful	5	24%	Negative acknowledgement the critic but where was the sense of how I actually am
	Largest part	4	19%	Largest part on the map
	Shame inducing	4	19%	Shame, shame, shame...
	Proven right when coping strategies don't work	2	10%	The ways of coping never worked and unmet needs are reinforced
	Voice of a parent	2	10%	Parent putting me down, ill and in hospital
	Wanting to be the best	2	10%	Making sure I'm better than others

Detached Modes. Descriptions of the Detached Protector found that 53% of participants used this part to "Block emotion" and five individuals felt that this part was driven by a "Fear of becoming overwhelmed" by emotion. Further, this part was felt to "Disconnect from others / the world" by nearly half of individuals.

Table 10 shows the Detached Self-Soother was found to be "Busy" (78%) and a "Distraction" (66%), whereas the Spaced-out Protector was described as managing the belief that it is "Unsafe to feel", but this part managed this through "Dissociation" (100%).

Table 10

Themes, No. of P's, percentages, and examples from descriptions of the Detached Coping Modes

SM	Theme	*N*	%	Example Quote
Detached Protector	Blocks emotion	8	53%	Hiding place from emotion
N=15	Disconnects from others / the world	7	47%	Deals with the world by shutting off not engaging with it
	Fear of becoming overwhelmed or unable to cope	5	33%	Pushed you to keep the feelings away for fear of being overwhelmed by them
	Struggles to express feelings	4	27%	Feels awkward, embarrassed to say how I feel
	Isolates self	3	20%	Likes to be by itself
	Others won't understand	2	13%	Can't show feeling because they won't understand
	Protective	2	13%	keep each other safe / protect
Detached Self-soother	Busy	7	78%	Being busy, doing things
N=9	Distraction	6	66%	Distracting self e.g. very involved in books/games
	Avoidance of thoughts / feelings	4	44%	Don't like being in my head
	Self-sabotaging behaviours	3	33%	Distracts with eating, self-harm, exercise, making plans (although don't often carry plans through
	Hard to relax	3	33%	Giving yourself permission to rest and chill is really difficult
	Exhausting	1	11%	Anxious and tired, exhausted at times
	Productive	1	11%	Always getting things done, organising putting things in order
Spaced-out Protector	Dissociation	7	100%	Can feel very numb and dissociated
N=7	Unsafe to feel	5	71%	It's not safe to feel
	Avoidance of emotion	4	57%	Avoidance, zone out from distress
	Doesn't let others in	4	57%	Protects but also stops letting people in
	Creates distress	2	29%	Mechanism of avoidance creates more distress in itself

Unintentional	1	14%	This is not intentional like it used to be

Surrender Modes. Nine themes arose from descriptions of the Compliant Surrender; "Appeasing others" was the most common theme (see Table 11). Six individuals referred to the idea that they felt they "Sacrificed their own needs" in an attempt to meet the needs of others, and that they did this as it felt "Protective" (*n*=6) or because they were afraid of being rejected (*n*=4).

The Helpless Surrenderer appeared less frequently (*n*=5) and held the role of attempting to get "others to care for them" (80%) as the part feels "Helpless" (80%) and overwhelmed about looking after themselves.

Overcontroller Modes. Table 12 shows how 67% of units were coded describing how the Perfectionistic Overcontroller has "Unrelenting Standards" but that this can "Lead to anxiety" (33%). Three individuals described a Bully part, all of whom felt this part displays "Anger and aggression towards others" and that this can happen when the part "Feels vulnerable" (*n*=2).

The most common Overcontroller Mode was the Eating Disorder (ED) Overcontroller and nine themes were established. The primary experience of this part was "Manipulative" (55%) and driven by the Demanding Mode (30%) and ED beliefs (25%).

Table 11

Themes, No. of P's, percentages, and examples from descriptions of the Surrender Coping Modes

SM	Theme	*N*	%	Example Quote
Compliant Surrender N=16	Appeasing others	11	69%	Needs to make everything good and enjoyable for everybody else
	Pretence	7	44%	This is like a front so no one really knows who I am
	Sacrifices own needs	6	38%	Even if it means squashing her own opinions or needs
	Protective	6	38%	Trying to protect myself
	Lack of trust – self	5	31%	Find it hard to make decisions and don't trust myself
	Hypervigilant of others	4	25%	Watching out for others' reaction, super vigilant
	In social situations	4	25%	Shows up in social situations
	Fear of rejection	4	25%	If I show my real self (with all my unheard needs) then people won't like me and they might reject me
	Never feels good enough	3	19%	Tries really hard and goes above and beyond to try to prove or "feel good enough"
	Pushed to limits	3	19%	Can stretch a long way but will eventually break
Helpless Surrenderer N=5	Helpless	4	80%	Feels completely overwhelmed and helpless
	Wants others to care for them	4	80%	Hope to be saved by others
	Desire to look ill	2	40%	Desire to look ill so that others can see that I need looking after
	Doesn't elicit care	1	20%	People don't respond to my helplessness in the way I desperately want
	Leads to Angry Child	1	20%	Leads to me being angry child when people don't respond

Table 12

Themes, No. of P's, percentages, and examples from descriptions of the Overcompensation Coping Modes

SM	Theme	*N*	%	Example Quote
Eating Disorder Overcontroller N=20	Manipulative	11	55%	Provides even more strategies, ways to control, and overthink, and overcompensate things in your life
	Connected to Demanding Mode	6	30%	Offers ways to appease critical voice
	Focus on ED behaviours	6	30%	Restrictive eating or purging brings a sense of control
	ED beliefs	5	25%	Body image and the way I look is important
	Guilt inducing	4	20%	Guilt inducing
	Feeds into coping modes	4	20%	Nothing is ever enough for it and it feeds into coping modes
	Blocks authenticity	3	15%	Increased censored self because dampened down or sedated the self
	Could be good but becomes unhelpful	2	10%	Wants to look after you
	Provides a sense of safety	2	10%	Keeps me safe from disappointment
Perfectionistic Overcontroller N=12	Unrelenting standards	8	67%	Demanding part of you that said you needed to be perfect
	Leads to anxiety	4	33%	Causes worry and ruminating
	Sense of control	3	25%	Links to trying to over-control everything to manage the worry and anxiety
	Feels inadequate	2	17%	Trying to make up for a sense of being inadequate
	Competes with others	2	17%	Making sure I'm the best, better than everyone else
	Rigid	1	8%	
Bully and Attack N=3	Displays anger / aggression towards others	3	100%	Aggressive
	Feels vulnerable	2	67%	Links to my vulnerable feelings, like feeling abandoned
	Pushes people away	2	67%	Gets angry and pushes people away

Negative long-term impact	2	67%	Kept things feeling stuck in the long-term

Figure 2

Maryam's pre-therapy formulation map

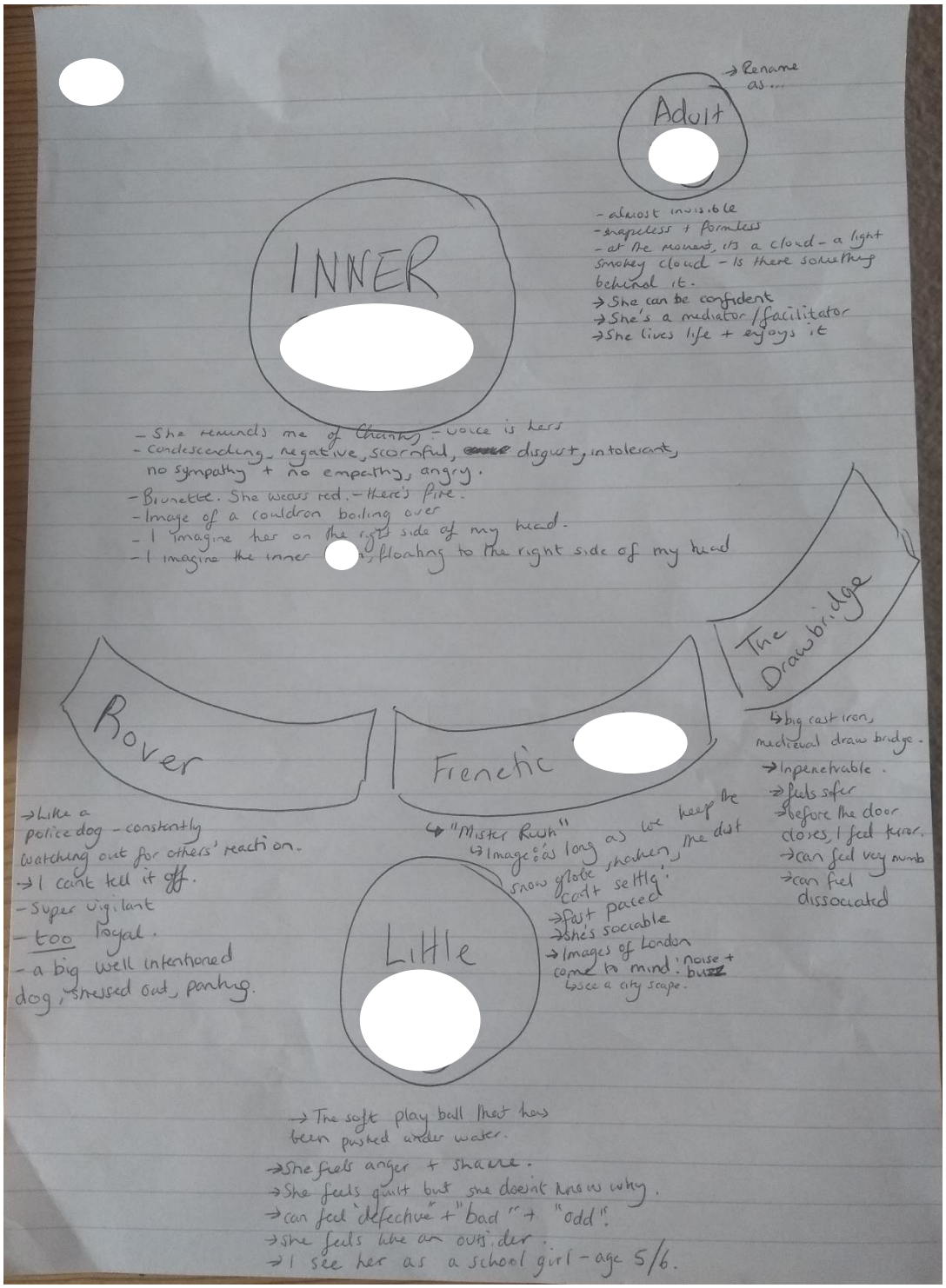
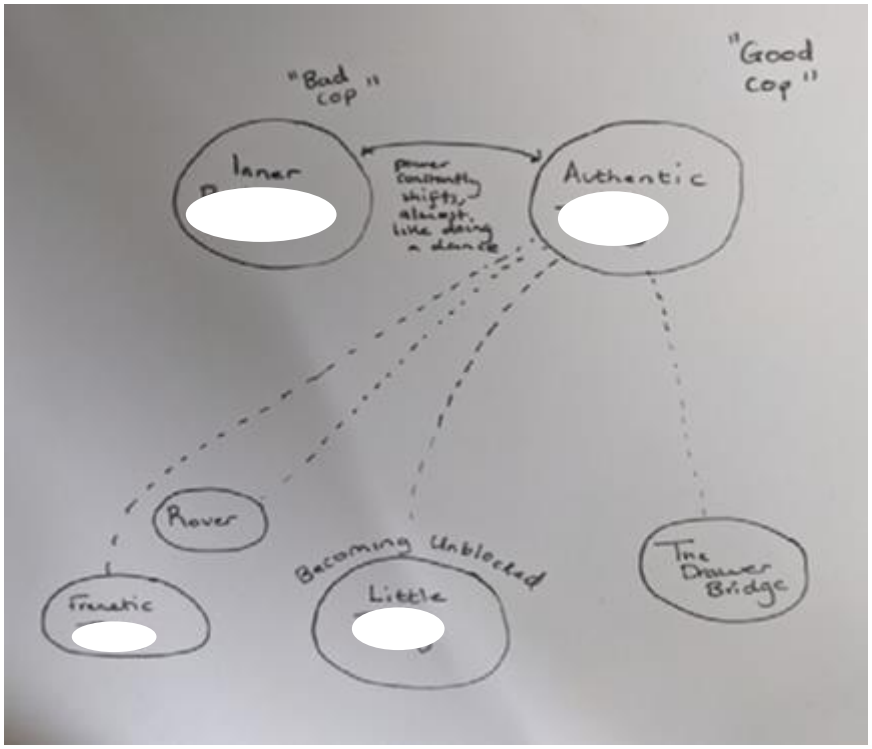


Figure 3

Maryam's post-therapy formulation map



1.3. How are the relationships between modes similar between participants?

To examine the relationships between modes, formulation maps were analysed, themes were created from the positioning of the parts and any drawings connecting or separating parts (see Table 13). Prior to therapy, formulation maps were drawn up collaboratively by the therapist and client. It was observed that the majority of individuals positioned the Demanding Critic at the top of the map (63%), with the coping modes in a line below the Demanding Critic and the Vulnerable Child at the bottom of the map (63%). Whilst other individuals placed the Vulnerable Child in the middle of the map (13%) with the coping modes surrounding the Vulnerable Child.

Post-therapy, clients were encouraged to amend (reformulate) their formulation maps to represent how they experienced the modes positionings. Figures 2 and 3 demonstrate some of the themes described such as how the positioning and size of parts can change. 52%

experienced that the coping modes were smaller or further away from the Vulnerable Child than prior to therapy and that the "Vulnerable Child had become connected to the Health Adult" (48%) (see Table 13). Changes related to the Healthy Adult will be expanded upon in research question 2. 14% of maps had less parts on the map than prior to therapy whilst another 14% had more.

Table 13

Themes, No. of P's, and percentages from of map positionings of modes from pre- and post-therapy formulation maps

Pre-therapy (N=24)			Post-therapy (N=21)		
Theme	N	%	Theme	N	%
Vulnerable child is at the bottom of the map, underneath the other modes	15	63%	Coping modes have got smaller or further away from VC	11	52%
Demanding Critic is at the top of the map influencing the maladaptive coping modes	15	63%	Vulnerable child has become connected to HA	10	48%
Coping modes are in a line above the Vulnerable Child or surrounding it	13	54%	Demanding mode moves further away from the other modes	5	24%
Vulnerable Child smallest part on map	7	29%	Vulnerable Child is larger	4	19%
Demanding Critic is interacting with the ED Overcontroller	5	21%	Parts have become integrated	3	14%
Demanding Critic is the largest part on the map	5	21%	Less parts on the map	3	14%
Perfectionistic Overcontroller - informed by Critic	5	21%	More parts on the map	3	14%
Where there is more than one child mode they are grouped together	5	21%	ED Overcontroller is less central to the map	3	14%
Vulnerable Child in the middle of the map	3	13%			

1.4. Do themes emerge between the individual toys chosen and which part they represent?

From the pictures of toys provided (n=10), themes did not appear to emerge between the toys chosen and the part that they represented (see Appendix I).

1.5. How do SMs on the SMI-ED relate to clinical severity and which SMs are the strongest predictors of clinical symptoms?

Multiple regression analyses were used to test the relationships between SMs and clinical severity. Individual multiple regressions were run for each SM, using baseline clinical scores from the corresponding measure to account for baseline effects. Assumptions were checked and met.

Pre-therapy Healthy Adult was not found to significantly predict post-treatment EDE-Q global (R^2 change =.072, $F(1, 11)$=2.824, p = .121), BMI (R^2 change =.001, $F(1, 11)$ = .021, p = .888), or CIA (R^2 change =.179, $F(1, 11)$ = .4.043, p = .079) after controlling for respective pre-therapy dependent variable scores. Thus, within this sample scoring higher on the SMI-ED-SF for Healthy Adult before therapy does not predict post-treatment clinical severity.

Pre-therapy Enraged Child scores significantly related to post-therapy clinical severity as measured by the EDE-Q global (R^2 = .234, $F(1, 11)$=21.647, p=.001) and CIA (R^2 = .243, $F(1,9)$=9.738, p=.032) after controlling for respective pre-therapy clinical severity scores (see Table 14). Hence, higher scores of Enraged Child before predicted higher EDE-Q scores post-therapy. However, a relationship was not found between Enraged Child scores and BMI, after controlling for baseline BMI ($F(1,11)$ = 5.5, p = .753).

Table 14

Multiple regression: Baseline Enraged child predicts EDE-Q post-therapy after pre-therapy EDE-Q is included in the model

		B	SE *B*	**β**
Step 1				
	Constant	-2.084	0.958	
	EDE-Q Pre	1.112	0.237	.804**
Step 2				
	Constant	-3.115	0.622	
	EDE-Q Pre	0.914	0.15	.661**
	Enraged Child Pre	1.28	0.275	.504**

Note. R^2 = .647 for Step 1, R^2 change= .234 for Step 2 ($p < .05$)

**p<.001, * p<.05

Pre-therapy Eating Disorder Overcontroller was found to relate to post-therapy EDE-Q global scores (see Table 15). The results of the regression indicated that after controlling for pre-therapy EDE-Q scores the Eating Disorder Overcontroller was a negative predictor of EDE-Q post-therapy scores (R^2 =.199, *F(1, 11)*=14.287, *p*=.003). Therefore, higher scores on the ED Overcontroller before therapy related to lower scores on the EDE-Q post therapy. Hence, the more that this mode was endorsed prior to therapy the better the post-therapy EDE-Q outcomes. However, this relationship was not found for BMI (*p*=.407) or CIA (*p*=.190).

Table 15

Multiple regression: Baseline Eating Disorder Overcontroller negatively predicts EDE-Q post-therapy after pre-therapy EDE-Q is included in the model

	B	SE *B*	**β**
Step 1			
Constant	-2.084	0.958	
EDE-Q Pre	1.112	0.237	.804**
Step 2			
Constant	-.600	0.768	
EDE-Q Pre	1.233	0.166	.892**
Eating Disorder Overcontroller Pre	-.605	0.160	-.455*

Note. R^2 = .647 for Step 1, R^2 change= .199 for Step 2 ($p < .05$)

**p<.001, * p<.05

No other baseline SMs were found to be significant predictors of post-therapy clinical outcomes as measured by EDE-Q global, CIA, and BMI.

2. Does SPEAKS therapy build the Healthy Adult SM, and does this relate to clinical change?

2.1. Is there a significant increase in the endorsement of the Healthy Adult over the course of therapy?

To investigate whether there was an increase of endorsement of the Healthy Adult over the course of therapy pre- and post-therapy maps and narratives were coded. Prior to therapy eight themes became apparent; themes around the Healthy Adult being on the "Edge of the map" or "Not on the map" were most frequent (see Table 16). Further, themes relating to the Healthy Adult's relationship with the Vulnerable Child were coded as "Furthest part from VC" and that the "Coping modes were between HA and VC".

Figure 4

Chloe's pre-therapy formulation map

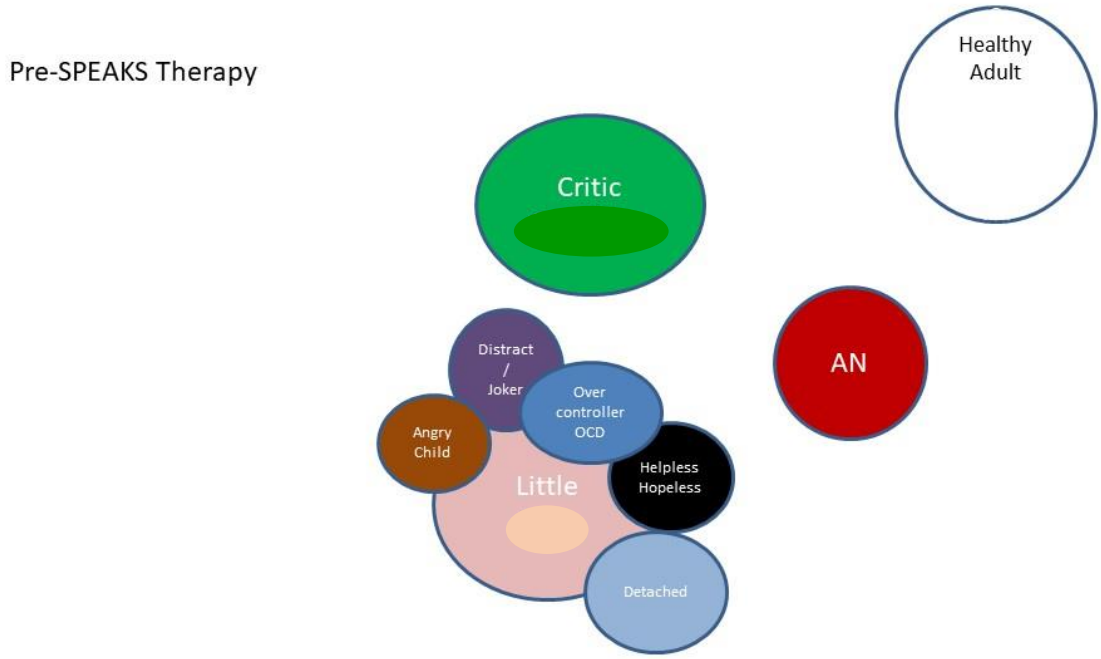
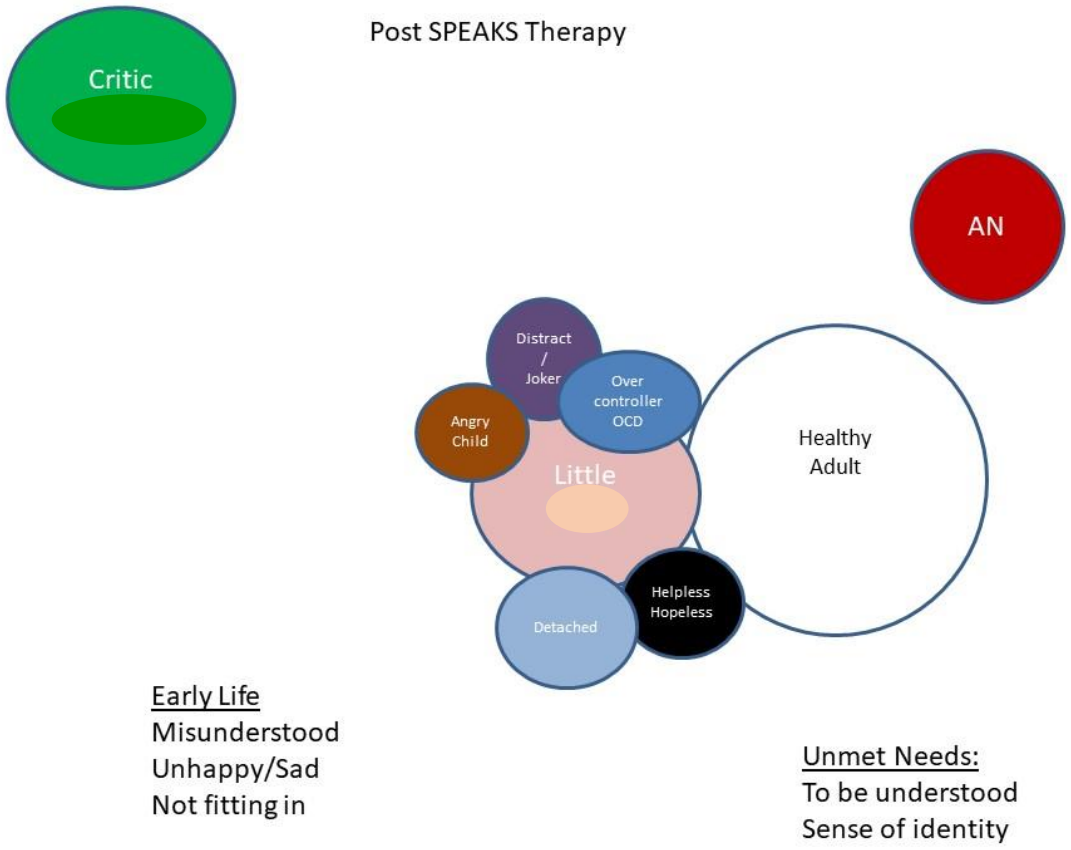


Figure 5

Chloe's post-therapy formulation map



After therapy, 71% of participants described how the Healthy Adult held an "Awareness of other parts" and 57% of participants described how they experienced the part as "Growing". An example of the change in the positioning of the HA in the formulation map can be seen in Figures 4 and 5.

These findings were supported by quantitative analysis of the measurement of the Healthy Adult by the SMI-ED-SF (see Table 5). A repeated-measures t-test found a significant increase in endorsement of the Healthy Adult from pre- to post-therapy, $t(11)=-2.858$, $p=.016$.

Table 16

Observations from the formulation maps about the Healthy Adult mode at the start of therapy compared with the end of therapy

Pre-therapy (N=15)			Post-therapy (N=21)		
Theme	N	%	Theme	N	%
Edge of map	11	73%	Awareness of other parts	15	71%
Desire for change	7	47%	Growing part	12	57%
Not on map	7	47%	Connected or next to VC	10	48%
Needs nurturing	5	33%	Centre of the map	9	43%
Furthest part from VC	5	33%	New to the map	7	33%
Coping modes between HA and VC	5	33%	Largest part	5	24%
Smallest part	4	27%	Between VC and coping modes	4	19%
Beneath other parts	2	13%	Surrounded by healthy coping strategies	3	10%
Hope	2	13%	Same position	2	10%
Several parts that have come together	1	6%	Informed by therapist	1	5%
Middle of the map	1	6%			

2.2. Does the change in the Healthy Adult SM relate to change in clinical and functional change?

Multiple regression analysis was used to test whether the Healthy Adult post-therapy scores related to post-therapy clinical change, after controlling for pre-therapy scores. The results of the regression indicated that post-therapy Healthy Adult was found to significantly predict post-treatment EDE-Q global (R^2 change=.244, $F(1, 17)$=17.797, p=.001) and CIA scores (R^2 change =.332, $F(1, 16)$=9.293, p=.004) after accounting for pre-therapy EDE-Q global scores and pre-therapy CIA scores respectively (see Tables 17 and 18). Therefore, post-therapy HA related to a reduction in EDE-Q and CIA scores. No significant effect of post-therapy Healthy Adult was found on post-therapy BMI (R^2 change =.218, $F(1,17)$=3.656, p = .346) after accounting for pre-therapy BMI in the model.

Table 17

Multiple regression: Post-therapy Healthy Adult predicts EDE-Q post-therapy after pre-therapy EDE-Q was included in the model

		B	SE *B*	**β**
Step 1				
	Constant	-2.480	1.181	
	EDE-Q Pre	1.224	0.280	.723**
Step 2				
	Constant	2.856	1.524	
	EDE-Q Pre	.559	0.259	.325*
	Healthy Adult Post	-.882	0.209	-.635**

Note. R^2 = .523 for Step 1, R^2 change= .244 for Step 2 ($p < .05$), **p<.001, * p<.05

Table 18

Multiple regression: Post-therapy Healthy Adult predicts CIA post-therapy after pre-therapy CIA was included in the model

		B	SE *B*	**β**
Step 1				
	Constant	-.101	0.586	
	CIA Pre	.615	0.293	.453
Step 2				
	Constant	2.217	0.825	
	CIA Pre	.138	0.270	.617
	Healthy Adult Post	-.484	0.146	-.675**

Note. R^2 = .206 for Step 1, R^2 change= .332 for Step 2 ($p < .05$), **p<.001, * p<.05

Discussion

This research explored SMs of adults with a diagnosis of Anorexia Nervosa through both formulations and questionnaire data. To the best of our knowledge, it is the first study to explore the experience of SMs from the client perspective within AN, and therefore adds depth to previous theoretical and quantitative literature about SMs. The study found that SPEAKS participants recognised high levels of Critic Modes and numerous coping modes reflecting detached and compliant behaviours. Broadly speaking the SMs endorsed in the formulations aligned with SMs endorsed via scorings on the SMI-ED-SF questionnaire.

The development of the Healthy Adult over treatment and its relationship to clinical change was focussed on in the project. There was a significant increase in the presence of the Healthy Adult during therapy indicated by both the formulations and the SMI-ED-SF questionnaire. Moreover, a more frequently present Healthy Adult post-treatment significantly related to improved post-treatment ED symptoms, including ED cognitions and behaviours. Additionally, it was found that better awareness of the ED Overcontroller (Critic) at the start of therapy may lead to better outcomes in ED symptoms, as measured by the EDE-Q.

SMs in Anorexia Nervosa

Although the ST model is a transdiagnostic approach, specific patterns within client groups related to their diagnosis are observed (Fassbinder et al., 2019) and specific modes can be found, such as ED Overcontroller. In this sample of people with AN, the three most endorsed modes from the pre-treatment formulation maps were: Demanding Critic, ED Overcontroller, and Vulnerable Child. The three highest rated SMs from the SMI-ED-SF were: Demanding Critic, Compliant Surrenderer and Detached Self Soother. Therefore, the Demanding Critic was the most common SM which aligns with previous research that individuals with AN in an inpatient setting had higher levels of Critic Modes than those without a mental health problem (Nesci et al., 2014).

The most endorsed SMs in this project also corroborate previous research by Talbot and colleagues (2015) who highlighted that Vulnerable Child and Demanding Critic were significantly more endorsed by people with AN compared with a community sample, alongside coping modes of Demanding Critic, Detached Self-Soother and Compliant Surrender. Therefore, the SMs that were found to be rated higher than community samples in previous research were found to be the highest rated by people with AN in this research

adding weight to their relevance within this population and the need for consideration of them in treatment.

The Bully and Attack SM was the least endorsed across both formulations and SMI-ED-SF, whilst the Self-Aggrandizer did not appear on the formulation maps. Previously these modes had only shown low correlations with ED symptoms (Simpson et al., 2018) and a recent Confirmatory Factor Analysis of the SMI-ED-SF found the Bully and Attack and Self-Aggrandizer appeared as a combined mode (Goddard et al., 2021). Therefore, this research supports the notion these SMs may not be as prevalent within AN or may not directly influence ED symptoms.

Experience of modes

The findings on the experience of SMs from the formulations and narratives generally support the definitions and understanding of transdiagnostic SMs (Young et al., 2003). Differences specific to the AN population included the presence of an ED Overcontroller and secondary emotions experienced following acting on the Angry Child.

Critic Modes

The Demanding Critic was recognised to be "Critical" and "Deceptive and Punitive". At the start of therapy this part was most commonly depicted at the top of the map influencing or driving the coping modes.

Within the schema literature, two Critic modes are often described: the Demanding Critic and the Punitive Critic. The Punitive Critic was measured by the SMI-ED-SF however it was not observed as a separate part on the formulation maps. The Demanding Critic's most common themes demonstrated how this part encompassed features of the Punitive Critic mode. Theory has suggested that individuals can have a combined Punitive and Demanding Mode (Young et al., 2003) and these parts were also found to co-exist within a case study

(Edwards, 2017b). Therefore, although these modes might be phenomenologically different in the literature, they might be experienced by clients concurrently as a "Blended Mode" (Edwards, 2022; Young et al., 2003). This is helpful to understand when working with clients individuals may relate to a single SM as found in this study.

Coping Modes

The Demanding Mode was most frequently positioned at the top of the map influencing the maladaptive Coping Modes which could be an example of a "mode sequence" (Edwards, 2022). The Coping Modes (Detached, Surrender, and Overcontroller) were usually depicted between the Child and Critic Modes on the pre-therapy formulation maps. This could represent how the Coping Modes can be internally triggered by the Critic Modes and respond to protect the Child Modes (Young et al., 2003).

From the coping modes that were recognised, detached and compliant behaviours were observed. The themes that arose for the Detached Modes supported previous theories of these modes (van Genderen et al., 2012; Young et al., 2003). The Detached Protector was found to "Block emotions" and driven by a "Fear of becoming overwhelmed or unable to cope", whereas the Detached Self-Soother focussed on activities that "Distract" from emotional distress.

A part recognised within other mode models (Edwards et al., 2021) that was recognised through observations of the formulation maps and narratives that did not correspond with the modes measured by the SMI-ED-SF was the "Spaced-out Protector". The Spaced-out Protector was described by seven people, all of whom reported experiences of "Dissociation" however, only one question on the SMI-ED-SF related to dissociation (Item 43) under measurement of the Detached Protector. One way of understanding this could be that the Spaced-out Protector is part of the Detached Protector. There are thought to be two ways that

Detached Protector can manifest, either as a preventative strategy or a reactive strategy (Corstorphine, 2008). This project found that the Spaced-out Protector had a theme of "Unsafe to feel" which could indicate that it is a preventative strategy that individuals implement if they anticipate emotion. Whereas the Detached Protector had a theme of "Fear of becoming overwhelmed" which could indicate that it is a reactive strategy which is implemented as secondary avoidance of affect (Corstorphine, 2008; Waller et al., 2007). Delineation of the detached protector into these parts within formulations for people with AN might be important in order to assist clients to better understand the role these coping mechanisms play and make appropriate change.

Child Modes

The Child Modes were usually positioned at the bottom of the map beneath the maladaptive coping modes or surrounded by the other modes prior to therapy. The Vulnerable Child was frequently the smallest part of the map which might represent the experience of being suppressed by the maladaptive Coping Modes (Young et al., 2006) or silenced by the Critic Modes (Oldershaw & Startup, 2022).

It is generally understood that the Angry Child feels angry about being unfairly treated (Edwards, 2022; Young et al., 2006) as found in this project, however the findings provide a new insight that acting on the feelings of the Angry Child can lead to secondary emotions of guilt and shame. This is not something that has previously been considered in the understanding of this mode and could be further researched in other client groups.

Healthy Adult

The most common themes were that the Healthy Adult can make "Emotional connection" and have "Capacity for taking responsibility". This experience of the Healthy

Adult represents the core of healthy functioning and the underlying concept (Bach & Bernstein, 2019; Edwards, 2022).

At the start of therapy, the Healthy Adult was frequently observed to be the "Furthest part from the Vulnerable Child" (*n*=5). Post-therapy the secondary theme from the positioning of the parts on the formulation map was "Connected or next to Vulnerable Child" (*n*=10) and/or the Healthy Adult had moved to be "Between Vulnerable Child and coping modes" (*n*=4). This finding symbolises how after therapy the Healthy Adult is able to connect with the "Core Pain" that is experienced by the Vulnerable Child, that some of the blocks to emotion have been removed, and the modes have become more integrated. This allows the Healthy Adult to be guided by their emotional experience, in line with the SPEAKS model (Oldershaw & Startup, 2022). This finding supports previous case study observations that the Healthy Adult becomes attuned to the Vulnerable Child after therapy (Edwards, 2017a).

SMs and clinical change

The main findings were that the Enraged Child schema mode predicted poorer outcomes as measured by the EDE-Q and CIA whereas the Eating Disorder Overcontroller predicted fewer eating disorder beliefs and behaviours after therapy, as measured by the EDEQ.

There has been mixed evidence surrounding the association between the Angry Child modes and AN. Previous research found a lack of association between the AN group and the Angry Child (Talbot et al., 2015) despite the literature supporting a connection between anger and AN (Milligan & Waller, 2000; Truglia et al., 2006), including behaviours such as restrictive eating (Espeset et al., 2012). This study found that the Angry Child modes were not frequently identified parts through the formulation maps or SMI-ED-SF, despite the connection to poorer outcomes.

One understanding of this could be that as AN is more frequently diagnosed within women than men (as represented in this sample) the way women are socialised to express emotions based upon gender stereotypes, particularly anger, is relevant (Oldershaw et al., 2019). Expressions of anger have been observed to be discouraged in girls (Zeman et al., 2012; Oldershaw et al., 2019) which might lead to women feeling that anger is an unacceptable emotion. Therefore, recognition and expression of the Angry Child modes might be suppressed and when the feelings of the Angry Child modes are expressed this can lead to "Guilt and Shame" as found in this project.

As higher levels of Enraged Child led to poorer outcomes, this indicates that emotions associated with the Angry Child modes, including secondary emotions such as guilt and shame, are important to consider when working with individuals with AN. Within schema mode work this would involve identifying, naming and working with the Enraged Child and other Angry Child modes.

Higher levels of Eating Disorder Overcontroller at the start of treatment predicted better outcomes on the EDE-Q and CIA post-treatment. One interpretation of this finding is that individuals with more awareness of the ED Overcontroller, and therefore their ED behaviours and beliefs, at the start of therapy enables this to be worked on within therapy and leads to better outcomes.

Presence of the Healthy Adult

The Healthy Adult was included in 58% of formulation maps before therapy and this changed to 100% of maps post-therapy. After therapy the Healthy Adult was most commonly described as having an "Awareness of other parts". This change was supported by a significant increase in the ratings of the Healthy Adult on the SM-ED-SF from before to after therapy ($p=.016$). This finding is important as it is known that people with AN do not tend to

rely on this part as often (Nesci et al., 2014; Simpson, 2012; Talbot et al., 2015; Voderholzer et al., 2014) and provides initial evidence that SPEAKS significantly increases the amount people with AN access the Healthy Adult

Prior to therapy the Healthy Adult did not predict post-therapy EDE-Q scores which fits with the idea that the Healthy Adult was underdeveloped. However, as scores over therapy increased the post-therapy Healthy Adult ratings significantly predicted post-therapy ED thoughts and behaviours as measured by the EDE-Q and CIA, with a more present HA relating to reduced ED thoughts and behaviours. The findings from this project provide evidence that developing a Healthy Adult mode enables individuals to acknowledge, process, and be guided by their emotions. This supports the theory behind the SPEAKS model, that AN might arise and perpetuate from a lost sense of emotional self (Oldershaw et al., 2019; Oldershaw & Startup, 2022), and the concept of the Healthy Adult as a mechanism of change when working with people with AN through connecting with their emotions which leads to self-agency. This is in line with the literature surrounding emotional difficulties in AN, specifically surrounding emotional avoidance (Oldershaw et al., 2019; Treasure et al., 2016).

Strengths and Limitations

The main strength of this project was its mixed methods design. The qualitative method allowed for detailed exploration into participants' experiences of each SM, utilising information understood within therapy sessions. Combining this with quantitative data analysis meant the information could be triangulated which ensured it was rich in detail (Adams, 2015).

Up until now, the theory that exists for SMs has been developed theoretically. Therefore, strengthening this theory using a bottom-up approach provides vital information on client's experiences of SMs to inform theory. A deductive approach to content analysis was taken, which might mean the findings are more likely to support the theory (Hsieh and Shannon,

2005). Although the way the data was approached has limitations, the researcher ensured to look for differences and new information in the data to enrichen the understanding in the literature.

The qualitative analysis was carried out first to ensure that the researcher was not influenced by outcomes of the quantitative analyses, which ultimately supported the findings from the content analysis. Within content analysis although percentages were calculated to represent proportion of the sample that contributed to a theme these can be misrepresentative in small samples. Therefore, the author reported the number of people who had contributed to a theme as well.

A mixed-methods approach was important considering the small sample size and missing data. Although the sample size this was appropriate for a feasibility trial, this meant that there was limited power when running the statistical analyses which could have led to an increased chance of accepting the null hypotheses to be true.

Further, no significant impact of SMs was found on BMI. This is likely to be because BMI was not used as an exclusion criterion, therefore people were able to access SPEAKS therapy without a low BMI. This means that there may not have been a significant change in BMI over SPEAKS for some people, but ensured inclusive access to the therapy.

A final limitation of the study is the lack of diversity in the sample, although this is not unusual in ED research (Halbeisen et al., 2022) future research should consider finding ways to reach more diverse samples, for example gender and race. Further, ST is a Western model of psychological treatment and may need to be adapted when working with diverse populations (Mao et al., 2022). For example, expressing emotions about parents within sessions may go against cultural norms and this could potentially strengthen unhelpful Parent/Critic modes. Thus, considering another “respected figure” to help individuals confront their Critic modes could be helpful. Therefore, whilst the key SM pattern and

experiences found within this research might be applicable across cultures, the way that this might present could vary.

Future Research

Being curious about the experience of AN and experiences in therapy is key to improving interventions in this area. Whilst the Healthy Adult mode is considered to be a transdiagnostic mode (Bach and Bernstein, 2019), further explorative research into whether maladaptive SMs are experienced similarly across different diagnoses would improve our understanding of transdiagnostic modes. Continued exploration into the relationship between SMs in individuals with AN and clinical outcomes would be enlightening, and a focus on establishing the role of emotions such as anger, shame, and guilt in AN and therapy outcomes.

Future research into the role of the Healthy Adult as a mechanism of change would benefit from a larger sample size and long-term follow-ups to see whether there are lasting effects. Additionally, a randomised controlled trail to further investigate the effectiveness of SPEAKS may be indicated. Future, research should also aim to include more diverse samples, including underrepresented groups.

Conclusion

This study explored SMs in both formulations and questionnaire data of people with AN. The findings suggested that participants had high levels of internal Critic Modes which supported previous findings. Results suggested that acting on the Angry Child modes leads to feelings of guilt and shame which could negatively predict outcomes. Therefore, working with the Enraged Child throughout therapy is important. Increased awareness of the ED Overcontroller at the start of therapy positively predicted outcomes. SPEAKS therapy improves the presence of the Healthy Adult and in turn predicts fewer ED thoughts and

behaviours post-therapy. This supports the premise that the Healthy Adult is a mechanism of change and should be identified and built during therapy for AN.

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Section C

Appendix of supporting material

Appendix A

Critical Appraisal Tables (Section A)

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Appendix B

Confirmation of Ethical Approval from HRA

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Appendix C

Participant information sheet

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Appendix D

Participant Consent Form

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Appendix E

Schema Mode Inventory – Eating Disorder Short Form

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Appendix F

Eating Disorder Examination Questionnaire

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Appendix G

Clinical Impairment Assessment

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Appendix H

Content Analysis Codebook

Table 5. *Content Analysis Codebook*

1. Coding of description of SMs

SM	Code	Definition
Healthy Adult (HA)	Desire for change	Client expresses a desire for the future to be different, what it might be like to recover, what that might look like, or how that might feel
	Mature / dependable	Positive traits associated with the HA are described
	Hope	Client expresses that the HA remains hopeful about the future
	Emotional connection and tolerance	Client indicates that the HA is aware of emotions and listens and responds to them appropriately
	Capacity for taking responsibility	Part is able to take responsibility for getting their needs met and of their actions
	Needs nurturing	Recognises that the HA needs to be nurtured in order to show up
	Alternative perspective	Reflects on how the HA is able to challenge extreme thoughts and offer an alternative or more balanced point of view
	Authentic	Individual recognises that this part is genuine and true to themselves
Vulnerable Child	Inadequate and worthless	Client describes that this part doesn't feel good enough or has no value
	Isolated / lonely	This part does not feel like they are navigating the world by themselves and that they don't get connection with others
	Core pain	Client describes painful emotions or an awareness of painful emotion that they are not able to get in touch with
	Vulnerability	Client expresses part feels like it is exposed and might be physical or emotionally harmed if it is not protected
	Hides emotion	Client describes attempting to ignore or hide their emotion from themselves or others

	Feels incapable	Reference to feeling childlike, incapable, or uncertain of their decisions or actions
	Unmet needs	Client reflects on needs or emotions that haven't been met or experiences / feelings they seek from caregivers from childhood or at present
Angry child	Leads to guilt and shame	Actions described can lead to feelings of guilt and/or shame
	Angry about unmet needs	Part reacts when needs go unmet or feels misunderstood
	Directed at self	When angry the behaviours are directed at themselves, usually through a self-destructive behaviour
	Directed at others	Blames or pushes other people away
	Misunderstood	Reacts when they feel that they or the ED are misunderstood by other people
Happy child	Suppressed pre-therapy	Client reflects that the part may be present but that prior to therapy it is suppressed
	Playful	Clients describes that the part likes to have fun or be playful
Demanding Mode	Critical	Part tells them things in order to control or influence their behaviour or distress them
	Deceptive and punitive	Part states things that are harsh, critical, or insidious
	Relentless	Part is persistent and insistent in it's criticism
	Unhelpful	Client reflects that the part does not help them
	Largest part	Largest part on the map
	Shame inducing	Client describes that this part causes them to feel ashamed
	Proven right when coping strategies don't work	Client described if they unable to prove the part wrong then this part is reinforced
	Voice of a parent	Client reflects that the voice is one of a caregiver
	Wanting to be the best	Part is focussed on it's goals and being the best at them
Eating Disorder Overcontroller	Manipulative	Part has control or influences them or is deceptive in order to do so
	Connected to Demanding Mode	Client indicates that the part is informed related to the inner critic

	Focus on ED behaviours	Client references that the part suggests ways that they can improve themselves, specifically related to ED
	ED beliefs	Client describes that the part holds beliefs about themselves that reinforce ethe ED behaviours
	Guilt inducing	Part makes you feel guilty or ashamed
	Feeds into coping modes	Client reflects that the part leads to coping modes being activated
	Blocks authenticity	Client describes that the part prevents them or gets in the way of their authentic self, they might feel censored or sedated
	Could be good but becomes unhelpful	Part appears to be enticing or helpful on the surface
	Provides a sense of safety	Works to protect them
Detached Protector	Blocks emotion	Client reflects that the part blocks or is cut off from emotion
	Isolates self	Client describes that the part likes them to be alone
	Fear of becoming overwhelmed or unable to cope	Client identifies that they detach from emotions as they identify emotions being too powerful for them to cope with or that they are afraid that experiencing explicit emotions will be overwhelming
	Struggles to express feelings	Client expresses discomfort in saying how they feel or feel unable to share with others how they're emotions
	Disconnects from others / the world	Client indicates that that the part shuts down or doesn't engage with other people or the world
	Protective	Client identifies that it is way to cope emotions and keep themselves safe
	Others won't understand	Feels that other people won't understand how they're feeling
Detached Self-soother	Busy	Client describes keeping themselves occupied or busy
	Distraction	Client describes activities they do with the purpose of occupying their mind or distracting themselves
	Avoidance of thoughts / feelings	Client indicates that they keep themselves busy or distract themselves as a way of

		avoiding their thoughts or away from others
	Self-sabotaging behaviours	Client identifies behaviours that are harmful to them or related to ED
	Hard to relax	Client reflects that they find not doing anything or keeping busy difficult
	Productive	Client describes how this part can get things done
	Exhausting	Client reflects that being in this part is tiring
Avoidant Protector	Dissociation	Client describes feeling detached from themselves, others, or the world
	Unsafe to feel	Client reflects that this part is activated because it feels unsafe to connect with their emotions
	Avoidance of emotion	Part is used to avoid emotion
	Doesn't let others in	Part prevents connection with other people
	Creates distress	Client describes that this way of coping causes distress when they anticipate it or after it has happened
	Unintentional	Client reflects that they are not able to control when the part becomes active
Compliant Surrender	Sacrifices own needs	Prioritises other people's needs over their own or wiling to stretch / bend to meet others needs
	Pretence	Describes a front or a mask that is portrayed outward to other people
	Appeasing others	Part serves to please or placate others by meeting or satisfying their demands / demands the client perceives them to have
	Protective	Part is intended to protect them
	Pushed to limits	Part feels like it has to do more than it is capable of and finds it hard to do so
	Fear of rejection	This part becomes activated because the client wants to avoid rejection / is scared about being rejected by others
	Protective	Client feels that the part protects them
	In social situations	Part is primarily activated in social situations

	Hypervigilant of others	Part is on high alert around others, paying attention to their potential needs or potential rejection from others
	Never feels good enough	Despite putting others needs first the part never feels like it has done enough
	Lack of trust – self	Part doesn't trust themselves to make decisions, overthinks things they say and do, believes prioritising their own needs is wrong
Helpless surrenderer	Helpless	Part feels unable to take care of themselves and/or dependent on others to meet their needs
	Wants others to continue caring for them	Part wants to be cared for or saved by others
	Doesn't elicit care	Part is not successful at eliciting care from others
	Desire to look ill	Part might allow them to neglect themselves in the hope that it communicates that they need to be cared for
	Leads to Angry Child	Client reflects that when the part is unsuccessful at getting their needs met it leads to the presence of Angry Child
Perfectionistic Overcontroller	Unrelenting standards	Part tries to strive to meet very high internalized standards of behaviour in an attempt to be perfect
	Leads to anxiety	This part causes secondary anxiety
	Sense of control	Client reflects that it gives them a sense of control or psychological safety initially
	Informed by critic	This part is activated by criticism or acts to avoid criticism
	Feels inadequate	Reflections of inadequacy
	Competes with others	This part strives to be better than others
	Rigid	Part holds rigid rules or is inflexible in it's beliefs
Bully and Attack	Pushes people away	Part can lash out at others or behave in ways that stop others trying to connect with them
	Displays anger / aggression	Part is described as aggressive or angry

Negative long-term impact	Client reflects that there are consequences for this part
Feels vulnerable	Part might respond in this way when it is feelings vulnerable or inadequate

2. Coding for Healthy Adult Map observations

Pre-therapy

Code	Description
Edge of map	Healthy Adult is on the edge of the map
Not on map	Healthy Adult is not on the map
Furthest part from VC	Healthy Adult is the furthest part from the Vulnerable Child
Coping modes between HA and VC	There are coping modes between the Healthy Adult and the Vulnerable Child
Smallest part	The Healthy Adult is the smallest part
Beneath other parts	Healthy Adult is underneath the other parts
Several parts that have come together	The Healthy Adult is made up of a number of parts
Middle of the map	Healthy Adult is in the middle of the map

Post-therapy

Code	Description
Connected or next to VC	The Healthy Adult is next to or connected to (e.g. using a line or description) the vulnerable child
Centre of the map	The Healthy Adult is at the centre of the map
Largest part	Healthy Adult is the largest part on the map
Between VC and coping modes	The Healthy Adult is positioned between the Vulnerable Child and the coping modes
Surrounded by healthy coping strategies	The Healthy Adult is near healthy coping strategies that have been added to the map
New to the map	The Healthy Adult was not on the client's pre-therapy map but has been added to the post-therapy map
Same position	The Healthy Adult remains in the same place on the map
Informed by therapist	The therapist is drawn on the map with a line connecting to Healthy Adult

Appendix I
Table of toy chosen in SPEAKS therapy

Table 6. *Mode category, SM, Toy, and No. of P's who chose the toy*

Mode	SM	Toy	N
Healthy Adult		Elephant	1
		Unicorn	1
		Dog / giraffe / butterfly / pink man	1
		Dog	1
		Mouse on a tomato	1
		Plant	1
		Kangaroo	1
		Tiger	1
		Bear skin minion	1
Vulnerable Child modes		Girl holding a ball of snow	3
		Mouse	2
		Alien toy	1
		Fish	1
		Flat blue figure	1
		Stretchy man	1
		Killer whale	1
Angry Child modes			
Healthy Child modes	Playful Child	Madagascar hippo	1
	Happy child	Troll	1
Detached / Avoidant modes	Detached Protector	Hooded figure with sunglasses	1
		Ice cream cone	1
		Lizard	1
		Killer whale	1
		Yellow bike toy	1
		Girl carrying a ball of snow	1
		Turtle	1
		Bat	1
		Purple Lion	1
	Detached Self-soother	Little green army man	1
		Dumbo	1
		Dinosaur	1
		Sonic	1

		Minnie Mouse	1
		Snow globe shaken up	1
		Red flag	1
	Spaced out Protector	Tortoise	1
		Pink panther	1
		"cast iron medieval drawbridge"	1
Overcompensation modes	Perfectionistic Overcontroller	Giraffe ruler	1
		Minion	1
		Ant	1
		Princess / dancer / smurf	1
		Star trek toy – spoke?	
	ED Overcontroller	Medal	1
		Elephant	1
		Angry bird green pig	1
		Dog with raised paw	1
		Octopus	1
		Alien	1
	Social Overcompensator	Happy face	1
		Smurf blowing party blower	1
	Suspicious Overcontroller	Fear from Inside out	1
		Dog	1
	Angry Protector	Bee	1
		Girl with axe	1
		Shark	1
Surrender modes	Compliant Surrender	Stretchy man	2
		Skate-boarding hot dog	1
		Joy from Inside out	1
		Princess doll	1
		Puppy	1
		Prisoner minion	1
Parent modes	Shaming Parent	Snake	2
		Crocodile	1
		Black suit man	1
		Black sinister creature	1

Demanding Parent	Alien spider	1
	Fish	1
	Lemur (no pic)	1
Punitive Parent	Black figure	1
	Stretchy person	1
	Tiger	1

Appendix J

Feedback to HRA

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Appendix K

International Journal of Eating Disorders Review submission guidelines

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