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The Role of Mentalisation in the Development and Maintenance of Eating Disorders in Children and Adolescents: a Three-Part Investigation

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A Thesis Presented for the Degree of *Doctor of Philosophy*

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Statement of Originality

I declare that this thesis has been composed solely by myself and that it has not been submitted, in whole or in part, in any previous application for a degree. Except where stated otherwise by reference or acknowledgment, the work presented is entirely my own.

Cecily Donnelly, June 2023

To my late Grandfather, Charles Bowen, who did not have the chance to go to university. He chose to preserve his mental health by not reading this thesis, but his belief in me never wavered.

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Abstract

Mentalisation, or reflective functioning, is integral to emotional well-being and social communication. Poor mentalisation has been associated with poor mental health, including eating disorders. However, research into how mentalisation interacts with psychosocial factors associated with the development of an eating disorder in non-clinical samples has not been explored. Additionally, how far mentalisation in the parents of adolescents with eating disorders is modifiable, and whether changes in parent mentalisation can impact treatment outcomes for these adolescents, have not been explored. The overarching aims of this thesis therefore are to explore further the roles that mentalisation, including parent mentalisation, plays in the development of eating disorders and in their treatment outcomes, and to understand the usefulness of mentalisation as a therapeutic target for adolescents with eating disorders. To do so, three studies were conducted: a cross-sectional survey-based school study, secondary data analysis on families receiving family therapy, and a prospective observational study of an NHS parent intervention. The results suggest that aspects of mentalisation, particularly self-mentalisation, are strongly associated with disordered eating behaviours, both in clinical and community adolescent samples. Additionally, mentalisation appears to correlate with a variety of eating disorder risk and protective factors. Finally, improved parent mentalisation for this population of parents is possible through both family and parent-focused interventions, but parent mentalisation change is not a direct predictor of treatment outcomes. Areas for future research include use of longitudinal designs to examine how mentalisation and eating disorders develop together through adolescence, the use of a wide range of tools to measure parent and adolescent mentalisation, including the use of Video-feedback Intervention to promote Positive Parenting, and the integration of mentalisation techniques into prevention and treatment interventions.

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Nomenclature

3PS-SF	Big Three Perfectionism Scale (Short Form)
%mBMI	Higher Percentage Median Body Mass Index
AAI	Adult Attachment Interview
ABC	Aberrant Behaviour Checklist
AFT	Adolescent-Focused Therapy
AN	Anorexia Nervosa
ANOVA	Analysis of Variance
AQ-10	Short Autism Screening Quotient
ARFID	Avoidant Restrictive Food Intake Disorder
ASD	Autism Spectrum Disorder
ASQ-SE	Ages & Stages Questionnaire – Social-Emotional
BED	Binge Eating Disorder
BMI	*Body Mass Index*
BN	Bulimia Nervosa
BPD	Borderline Personality Disorder
CAMM	Child and Adolescent Mindfulness Measure
CAPS	Child-Adolescent Perfectionism Scale
CBCL	Child Behaviour Checklist
CBT	Cognitive Behavioural Therapy
CBT-E	Enhanced Cognitive Behavioural Therapy
CDQ	Cognitive Development Questionnaire
CHC	Community Health Centre
CIB	Coding Interactive Behaviour
DERS	Difficulties in Emotion Regulation Scale
DSM-V	Diagnostic and Statistical Manual Of Mental Disorders
EA	Emotional Availability
ED	*Eating Disorder*
EDE-Q	Eating Disorder Examination Questionnaire
EDE-QS	Eating Disorder Examination Questionnaire (Short)
EDI	Eating Disorder Inventory
FMSS	Five-Minute Speech Sample
FMSS-RF	Five-Minute Speech Sample Coded for Reflective Functioning
FBT	Family-Based Therapy
fMRI	**Functional Magnetic Resonance Imaging**
FT	Family Therapy
FT-AN	Family Therapy for Anorexia Nervosa
GAPS	Guilt About Parenting Scale
GFFAD	General Functioning Subscale of the McMaster Family Assessment Device
HRA	Health Regulatory Authority
IC	*Interest and Curiosity Subscale of the PRFQ*
ICD-11	International Classification of Diseases
ICREC	Imperial College Research Ethics Committee
IPT	Interpersonal Psychotherapy
IQ	*Intelligence Quotient*
MBT	Mentalisation-Based Therapy
MM	Mind-Mindedness
NHLBI	National Heart, Lung, and Blood Institute
NHS	*National Health Service*
NICE	*National Institute for Health and Care Excellence*
NR	Non-Randomised Controlled Trial
PDI	Parent Development Interview
PI	*Pregnancy Interview*
PM	*Pre-Mentalising Subscale of the PRFQ*
PPI	Patient and Public Involvement
PRF	Parental Reflective Functioning
PRFQ	*Parental Reflective Functioning Questionnaire*
PROMIS-PPRS	PROMIS Paediatric Peer Relationships Scale (Short Form)
PSHE	*Personal, Social, Health and Economic Education*

RCT	Randomised Controlled Trial
REC	Research Ethics Committee
RF	Reflective Functioning
RFQ	Reflective Functioning Questionnaire
RFQ-8	Reflective Functioning Questionnaire With 8 Item Scale
RFQ-Y	Reflective Functioning Questionnaire For Youth
RFQY-5	Reflective Functioning Questionnaire For Youth (Short)
RFS	Reflective Functioning Scale
RMET	Reading the Mind in the Eyes Task
RSES	Rosenberg Self-Esteem Scale
SCDC	Social and Communication Disorders Checklist
SCS-Y	Self-Compassion Scale for Youth
SDQ	Strengths and Difficulties Questionnaire
SIAQ	Sociocultural Internalisation of Appearance Questionnaire
SIAQ-A	Sociocultural Internalisation of Appearance Questionnaire – Adolescents
SM	*Certainty in Mental States Subscale of the PRFQ*
SPSS	Statistical Product and Service Solutions
SRS	Social Responsiveness Scale
SSCM	Specialist Supportive Clinical Management
SSP	Strange Situation Paradigm or Procedure
SSRS	Social Skills Rating System
TAU	Treatment As Usual
ToM	Theory of Mind
VIPP	Video-feedback Intervention to Promote Positive Parenting

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Chapter 1: General Introduction

1.1 An Introduction to Mentalisation

At the heart of this thesis on eating disorders lies the fundamental psychological concept of mentalisation, also known as reflective functioning, which has undergone extensive development and exploration over the past 25 years.

Mentalisation is the ability to recognise, understand and interpret mental states, of other people and of ourselves (Allen, Fonagy & Bateman, 2008; Fonagy, et al., 1991; Fonagy & Allison, 2014; Fonagy, Gergely & Jurist, 2018; Luyten & Fonagy, 2015). These mental states include, but are not limited to, beliefs, intentions, desires and emotions. Mentalisation is a fundamentally human skill, which continues to develop throughout childhood, adolescence and young adulthood (Blakemore, 2008; Dumontheil, Apperly & Blakemore, 2010; Fonagy, Gergely & Jurist, 2018). It is an important cognitive and affective process that allows us to communicate effectively, form close relationships and regulate emotions in healthy ways.

Mentalisation plays a crucial role in effective social functioning, as it allows the individual to understand social cues, and interpret and respond appropriately to the mental states of others, so they can, for instance, engage in conversation, co-operate with colleagues, or seek help from professionals (Luyten et al., 2020a). Social functioning is made much more difficult if one cannot interpret and predict behaviour, or understand “unwritten social rules” like sarcasm or irony; being able to understand mental states and how they impact behaviour supports us in communicating effectively, and prevents us from embarrassing or ostracising ourselves from others (Allen, Fonagy & Bateman, 2008; Fonagy et al., 1991; Fonagy & Allison, 2014; Fonagy, Gergely & Jurist, 2018; Luyten & Fonagy, 2015). Through encouraging and cultivating good mentalising abilities, individuals can enhance their social and emotional well-being, and experience greater satisfaction in their relationships and daily life (Allen, Fonagy & Bateman, 2008). It also helps our development of empathy and perspective-taking, skills which are essential to navigating social environments with ease.

As mentalisation is necessary for social communication, it is a crucial skill when it comes to forming and maintaining meaningful relationships. By attempting to understand the mental states of others, it is possible to form deep connections and cultivate a sense of mutual understanding and respect. Being able to mentalise also helps us resolve conflicts and navigate interpersonal challenges (Allen, Fonagy & Bateman, 2008; Fonagy, et al., 1991; Fonagy & Allison, 2014; Fonagy, Gergely & Jurist, 2018; Luyten & Fonagy, 2015).

Mentalisation is crucial for regulating emotions, by allowing the understanding and management of emotional states of oneself and others, such as why someone might be upset (Lombardi et al., 2022; Schwarzer et al., 2021). By recognising and reflecting on our emotional experiences, we can regulate effectively and avoid the need for unhelpful and potentially dangerous behaviours. Being able to mentalise allows people to recognise and challenge negative thinking patterns that contribute to emotional distress. Struggling to mentalise has many consequences, including mental health problems and relationship breakdown (Allen, Fonagy & Bateman, 2008; Fonagy et al., 1991; Fonagy & Allison, 2014; Fonagy Gergely & Jurist, 2018; Luyten & Fonagy, 2015).

1.1.2 Conceptualising Mentalisation

The history of understanding mentalising can be traced back to the early roots of psychoanalytic theory, which emphasised the importance of understanding unconscious mental processes and the role of the therapist in helping the patient to develop insight into their inner world. However, it was not until the late 20th century that the concept of mentalising and its importance in psychotherapy began to receive greater attention. In the late 1990s the term "mentalisation" was introduced by Peter Fonagy and colleagues as a specific construct allied to a therapeutic approach (Fonagy, et al., 1991). Early research focused on the development of mentalisation in children, particularly those who had experienced early attachment disruptions and trauma. Fonagy and colleagues proposed that mentalisation plays a crucial role in the development of secure attachment and the regulation of affect and behaviour (Fonagy, et al., 1991). They also suggested that disruptions in mentalisation may contribute to the development of psychopathology. The theory was originally elaborated in the context of borderline personality disorder (Bateman & Fonagy, 2013). Since then, mentalisation has become an increasingly interesting concept in the fields of psychology and psychiatry, with researchers and clinicians using it to better understand and treat a range of mental health problems (Bateman & Fonagy, 2019). The concept of mentalisation has also been applied to various therapeutic modalities, including mentalisation-based therapy (MBT), which aims to improve patients' ability to mentalise and thereby improve their interpersonal relationships and emotional regulation (Bateman & Fonagy, 2019).

Mentalisation has often been conceptualised as a continuum with two polarities: hyper-mentalisation and hypo-mentalisation (Bateman & Fonagy, 2019). Hyper-mentalisation involves an excessive focus on mental states, which can lead to over-reliance on assumptions that go beyond observable data (Sharp et al., 2013). Individuals who display hyper-mentalisation may struggle to articulate their thought processes or have others follow their reasoning. This overemphasis on mental states can result in misinterpretation of social cues,

leading to miscommunication and conflicts in social interactions. For example, if someone thinks they can anticipate what their partner is thinking, they may react prematurely and inappropriately. Conversely, hypo-mentalisation refers to a lack of attention or consideration given to mental states (Bateman & Fonagy, 2013; Fonagy, 2015). Individuals who display hypo-mentalisation may struggle to understand or recognise the emotions and intentions of others, leading to difficulties in forming and maintaining social relationships. This might manifest, for example, as being surprised if someone is upset by a thoughtless comment. Both hyper- and hypo-mentalisation have been associated with various mental health conditions (Bateman & Fonagy, 2019).

Mentalisation can be further understood through four polar dimensions: cognitive-affective, self-other, external-internal and automatic-controlled dimensions (Bateman & Fonagy, 2019; Bateman & Fonagy, 2013; Luyten & Fonagy, 2015; Luyten et al., 2020b). Understanding mental states requires both cognitive and affective (emotional) insight. Cognitive mentalising involves understanding and making inferences about cognitive mental states like beliefs, intentions and desires, using skills like perspective-taking and Theory of Mind. In contrast, affective mentalising involves first recognising emotions from which to infer what a person is feeling, then responding appropriately (either to our own emotions or those of others). These inferences help us to guide social interactions effectively (Bateman & Fonagy, 2019; Bateman & Fonagy, 2013; Luyten & Fonagy, 2015; Luyten et al., 2020b). Hyper-mentalisation may arise when an individual relies too heavily on cognitive processes; mentalising becomes excessive and rigid. The individual begins to overthink and over-analyse social situations. Hypo-mentalising, on the other hand, can arise from over-emphasis on processes involved in affective mentalising (Bateman & Fonagy, 2019; Bateman & Fonagy, 2013; Luyten & Fonagy, 2015; Luyten et al., 2020b). It can arise when an individual becomes overly focused on their own emotions, to the point where they disregard or overlook the emotions of others. This can result in a lack of empathy and understanding in social interactions. Alternatively, hypo-mentalising can occur if an individual relies too heavily on their emotions when making judgements or decisions (Bateman & Fonagy, 2019; Bateman & Fonagy, 2013; Luyten & Fonagy, 2015; Luyten et al., 2020b). This can lead to biased thinking and the misinterpretation of social cues. Balancing cognitive and affective processing is important to understand both oneself and others effectively because it allows for a comprehensive and accurate understanding of mental states. By incorporating both cognitive and affective processing, the individual can gain a better understanding of the intentions, beliefs, and emotions of themselves and others, leading to improved social functioning and emotional regulation.

In regard to the self-other dimension, self-mentalisation involves recognising and understanding one's own emotions, thoughts, and intentions (Ballespí et al., 2021; Bateman & Fonagy, 2019; Luyten et al., 2020a). This allows individuals to regulate their emotions and behaviours appropriately, as well as to communicate their own mental states to others. For example, recognising and understanding one's own anger can help an individual control their feelings through constructive behaviours and so avoid acting impulsively or aggressively. Other-mentalisation involves recognising and understanding the emotional states of others (Ballespí et al., 2021; Bateman & Fonagy, 2019; Luyten et al., 2020a). This allows individuals to empathise with others, interpret social cues accurately, and respond appropriately. For example, recognising and understanding how to respond to our friend's sadness helps us offer emotional support and comfort. Both self- and other-mentalisation are important for understanding and regulating emotions in social contexts because they allow individuals to recognise and respond to their own and others' emotional states effectively. Focusing too much on either aspect can lead to problems with social functioning (Ballespí et al., 2021; Bateman & Fonagy, 2019; Luyten et al., 2020a). If someone is overly focused on self-mentalisation, neglecting other-mentalisation, they may struggle with empathy and have difficulty forming and maintaining close relationships. Equally, if someone is overly focused on other-mentalisation, they may struggle to understand and regulate their own emotions, be unable to comprehend their own emotional experiences and rely on unhelpful coping strategies, like self-harm. Achieving a balance enables effective identification and response to our own and others' emotional states, promoting better social functioning and emotional well-being (Ballespí et al., 2021; Bateman & Fonagy, 2019; Luyten et al., 2020a). By gaining insight into mental states, individuals can communicate skilfully, establish strong relationships, and manage their emotions in a healthy manner.

Internal and external mentalising refers to the focus of mentalising – whether it is directed towards internal mental states or external observable behaviours (Allen, Fonagy & Bateman, 2008; Bateman & Fonagy, 2019; Fonagy, et al., 2016; Katznelson, 2014). Internal mentalising involves understanding and recognising the internal mental states of oneself and others; it involves inferring mental states that are not directly observable. For example, when a friend seems sad, one might use internal mentalising to infer they are feeling sad and try to understand the reasons for their sadness. External mentalising involves understanding and recognising the observable behaviours and actions of oneself and others, without necessarily focusing on their underlying mental states (Allen, Fonagy & Bateman, 2008; Bateman & Fonagy, 2019; Fonagy et al., 2016; Katznelson, 2014). It involves recognising and interpreting cues from the environment, such as facial expressions, tone of voice, and body language, to make inferences about mental states. For example, if a friend is fidgeting and looking around

the room during a conversation, external mentalising can help us infer that they are feeling anxious or uncomfortable. We use both aspects together to help understand and navigate social situations. Internal mentalising is important for understanding and predicting underlying mental states, while external mentalising is used for predicting observable behaviours and actions (Allen, Fonagy & Bateman, 2008; Bateman & Fonagy, 2019; Fonagy et al., 2016; Katznelson, 2014). By using both internal and external mentalising, individuals can develop a more nuanced and accurate understanding of themselves and others.

The final dimensions to consider are the automatic and controlled modes of mentalising (Allen, Fonagy & Bateman, 2008; Bateman & Fonagy, 2019; Katznelson, 2014; Luyten et al., 2020b). Automatic mentalisation is fast and intuitive and relies on pre-existing mental templates to quickly recognise and understand mental states. It operates largely outside of conscious awareness and requires very little cognitive effort (Allen, Fonagy & Bateman, 2008; Bateman & Fonagy, 2019; Katznelson, 2014; Luyten et al., 2020b). Automatic mentalising is useful in social situations where quick decisions and responses are needed, such as when reacting to a sudden change in someone's behaviour. At the other end of the spectrum is controlled mentalisation. This mode is slower and more deliberate, involving conscious effort and therefore more cognitive resources (Allen, Fonagy & Bateman, 2008; Bateman & Fonagy, 2019; Katznelson, 2014; Luyten et al., 2020b). Controlled mentalising requires active reflection on mental states (either of oneself or others), and consideration of multiple perspectives or interpretations before reaching a conclusion. It is most often used in complex social situations, such as when dealing with interpersonal conflicts, where multiple mental states need to be considered. Over-reliance on either automatic or controlled mentalising can result in difficulties in accurately recognising and understanding mental states (Allen, Fonagy & Bateman, 2008; Bateman & Fonagy, 2019; Katznelson, 2014; Luyten et al., 2020b). When automatic mentalising is overused, hyper-mentalising can occur; people may jump to conclusions without any supporting evidence, becoming rigid about their interpretations of mental states. Overuse of controlled mentalising can lead to hypo-mentalising, whereby people may have a tendency to overthink and doubt their interpretations. An imbalance between controlled and automatic mentalising is necessary for successful communication and emotion regulation (Allen, Fonagy & Bateman, 2008; Bateman & Fonagy, 2019; Katznelson, 2014; Luyten et al., 2020b).

1.1.3 Mentalisation as an Umbrella Term

Mentalisation is known by various names and may be measured in different ways; it is a concept that has elicited a plethora of articles seemingly defining the same concept, whether it be mentalisation, reflective functioning (RF), Theory of Mind (ToM), emotional mind-mindedness, meta-cognition, empathy, and more. According to some academics, including

Patrick Luytens and Fonagy, mentalisation should be considered an umbrella term, encompassing a broad range of interconnected social cognition constructs, including (but not limited to) ToM, empathy, alexithymia and mindfulness (Luyten & Fonagy, 2015). and empathy are primarily concerned with the ability to understand and interpret the mental states of others, while mindfulness and alexithymia relate to the individual's capacity for self-awareness and attention to one's own internal mental processes (Luyten & Fonagy, 2015). Empathy, alexithymia and mindfulness concern affective components of mentalising, while focuses on cognitive features of mentalising (Luyten & Fonagy, 2015).

refers to the cognitive ability to understand that others have beliefs, desires, intentions, and perspectives different from one's own, enabling individuals to attribute mental states to others and predict their behaviour (Baron-Cohen, 2000). Empathy is the ability to understand and share the emotions of others, which allows us to respond appropriately to others' behaviours and so form and maintain relationships (Cuff et al., 2016). Alexithymia is a psychological trait characterised by difficulty in identifying, understanding, and expressing one's own emotions (Moriguchi et al., 2006). People with alexithymia struggle to recognise and articulate their feelings. Mindfulness is a state of present-moment awareness and non-judgemental acceptance of one's thoughts, emotions, bodily sensations, and surroundings (Kabat-Zinn, 2013). It involves cultivating attention and experiencing the present moment fully. In this thesis, I will be using the term mentalisation as an umbrella term that encompasses all four of these concepts.

1.1.4 The Development of Mentalisation

Successful mentalisation development is influenced by a combination of genetic, environmental and social factors. Mentalisation develops as infants start to recognise their own emotional experiences and those of their caregivers. As children grow older, they develop more complex mentalising abilities, such as understanding the intentions and beliefs of others. Mentalisation continues to develop throughout adolescence and into adulthood as individuals gain more experience in social situations. Environmental and social factors play a significant role in the development of mentalisation. Successful development of mentalisation is dependent on relationships, particularly the child's first attachment relationship with their parent or caregiver (Fonagy, et al., 1991; Fonagy, 2015; Luyten et al., 2020a; Sharp & Fonagy, 2008; Slade, 2005), with much evidence suggesting a correlation between the parent's ability to mentalise about themselves and their child, and their child's ability for mentalisation and social cognition (Aldrich, Chen & Alfieri, 2021; Camoirano, 2017; Ensink et al., 2015; Gambin et al., 2021). Parent mentalisation is the ability of the parent to understand, reflect on, and interpret the mental states of their child (Ordway et al., 2015; Slade, 2005; Slade et al., 2005)

and is associated with parental satisfaction and parenting sensitivity, quality of caregiving, and the child's development of social and emotional health (Adkins, Luyten & Fonagy, 2018; Adkins et al., 2022; Aldrich, Chen & Alfieri, 2021; Bammens, Adkins & Badger, 2015; Berthelot et al., 2019; Camoirano, 2017; Planalp, O'Neill & Braungart-Rieker, 2019; Rostad & Whitaker, 2016). For example, caregivers who are attuned to their child's emotional experiences and respond appropriately can help foster the child's mentalising abilities. They provide a secure base for the child to explore and learn about their own emotions and those of others. Through responsive interactions with caregivers, children learn to recognise and regulate their own emotional experiences, understand and respond appropriately to others and develop a sense of self and other. One meta-analysis demonstrated that parent mentalisation predicts the quality of the relationship between parent and child, and the strength of a child's attachment (Zeegers et al., 2017). However, children who have experienced early attachment disruptions, trauma or neglect may struggle with mentalisation. In such cases, their caregivers may have been unable to provide the necessary support for the child's developing sense of self and other. This can lead to difficulties in social interactions, emotional regulation and other aspects of mental health. Poor mentalisation in parents can lead to confusing and chaotic responses to their child's behaviours; this can reduce a child's ability to learn to regulate their emotions, which is associated with many different mental health problems (Fonagy, Gergely & Jurist, 2018; Ordway et al., 2015; Sheppes & Gross, 2015). Other research has suggested that good parent mentalisation can mediate the relationship between adverse childhood experiences and later mental health problems (Beck et al., 2017; Ensink et al., 2016; Ensink et al., 2017a), so acting as a protective factor. Because of this evidence, there has been an emphasis on interventions that can improve parent mentalisation. Several programmes have been developed to encourage parents to be curious about their child's mental states, which have been successful at improving both parent confidence and parent mentalisation (Byrne et al., 2019; Staines, Golding & Selwyn, 2019). Improved parent mentalisation has been associated with positive change for children, both in terms of behavioural and emotional outcomes (Adkins et al., 2022; Bammens, Adkins & Badger, 2015; Enav et al., 2019; Ordway et al., 2015; Slade et al., 2020). The significant role of parent mentalisation in shaping a child's development, social cognition and emotional well-being underscores the crucial need for nurturing and supportive relationships early in life. By fostering parents' ability to understand and interpret their child's mental states, interventions aimed at improving parent mentalisation have shown promising results in promoting positive outcomes for parents and children alike.

Early experiences of relationships are fundamental to successful development of mentalisation, but another crucial stage in development is adolescence, for several key reasons (Clarke & Rose, 2020; Dumontheil, Apperly & Blakemore, 2010; Sharp & Venta,

2013). Firstly, individuals undergo significant cognitive and emotional changes, thanks to hormonal influences (particularly sex hormones) and changes in the structure and function of the brain e.g. the prefrontal cortex (Blakemore, 2008; Goddings et al., 2012). Psychosocial functioning is particularly important at this time, because of the increasing importance of peer relationships and social interactions. These experiences require effective mentalisation skills to navigate new, complex social situations, regulate emotions, make sound judgments and form and maintain relationships (Beck et al., 2017; Ensink et al., 2017b; Fonagy, Gergely & Jurist, 2018). To successfully navigate these complexities, individuals must develop the ability to understand and interpret the mental states of others, including their peers. Adolescents who can accurately mentalise demonstrate enhanced interpersonal skills and adaptive coping strategies (Bateman & Fonagy, 2019).

Additionally, adolescence is a critical period for consolidating one's sense of self and developing a coherent identity. Mentalisation plays a vital role in this process by enabling individuals to reflect upon and understand their own thoughts, emotions and motivations (Fonagy, Gergely & Jurist, 2018; Sebastian, Burnett & Blakemore, 2008). By engaging in reflective thinking and mentalising about themselves, adolescents can better integrate their experiences, reconcile conflicting aspects of their identity, and develop a more coherent sense of self (Allen, Fonagy & Bateman, 2008; Bateman & Fonagy, 2019; Fonagy, Gergely & Jurist, 2018). Lastly, adolescence is a time of increased vulnerability to mental health challenges. Mentalisation deficits have been associated with various mental health issues, including depression, anxiety, borderline personality disorder, self-harm behaviours, and difficulties in emotion regulation (Fonagy, 2015; Gambin et al., 2021; Ha et al., 2013; Sawyer et al., 2012; Schwarzer et al., 2021; Sharp et al., 2013; Taubner, White et al., 2013; Washburn et al., 2016). A number of large studies of adolescents without diagnosed mental health problems have demonstrated that poor mentalisation is associated with both externalising and internalising problems (Bizzi et al., 2022; Cropp, Alexandrowicz & Taubner, 2019; Zandpour et al., 2023). Therefore, fostering mentalisation abilities during this stage is particularly important as it can serve as a protective factor, promoting psychological well-being and resilience (Borelli et al., 2015; Borelli et al., 2019).

1.1.5. Assessing Mentalisation

Different psychopathologies are associated with different impairments in mentalisation (Bateman & Fonagy, 2019). For example, people with borderline personality disorders may neglect their own mental states while being overly sensitive to the emotional states of others. People with psychosis struggle to interpret other people’s mental states, while people with anorexia nervosa (AN) may be prone to hyper-mentalising about others, assigning them with

mental states that are not grounded in reality. An inability to mentalise about one's own emotions manifests very differently to an inability to mentalise about other people's emotions (Bateman & Fonagy, 2019). This means that attempts to improve mentalisation need to be tailored to the type of impairment experienced. Accurate and efficient assessment of mentalisation is therefore important to establish what impairments a person may be experiencing, to allow treatment to be individualised and effective.

There are several factors that need to be taken in to account when assessing mentalisation, or indeed designing assessments. For example, in the *Handbook of Mentalising in Mental Health Practice* (Bateman & Fonagy, 2019), Patrick Luytens and colleagues argue that assessment should aim to systematically explore mentalisation across different contexts – those that elicit high arousal (stress) and those that do not (Luyten et al., 2019). Evidence suggests that arousal levels are integral to how successful one is at mentalising. As arousal increases, for example when feeling embarrassed or ashamed, people may switch from slower, more conscious, controlled mentalising to faster, often more biased, automatic mentalising (Luyten & Fonagy, 2015). One is likely to revert to pre-mentalising modes, including pretend or teleological modes. While automatic mentalising serves a purpose in situations where social information needs to be processed quickly (i.e. in threatening situations), it does not allow people to pause and reflect, and therefore can result in inappropriate appraisals of internal states of oneself or others (Luyten & Fonagy, 2015). In turn, this can result in social interactions that are uncomfortable, inappropriate, or even dangerous. Hence, there is a need for assessment to fully map when and with whom arousal increases and this switch from controlled to automatic mentalising occurs, so appropriate support can be provided. To elicit arousal, it is suggested that the assessor use probing or challenging techniques during assessment, such as language, tone of voice, and body language, alongside directed questions (Bateman & Fonagy, 2019; Luyten et al., 2019).

Luytens and colleagues (2019) suggest five ideal steps to follow when assessing mentalisation in the context of therapy:

1. Assess the client's overall capacity for mentalisation. Are there global imbalances between the four dimensions of mentalising, or are they specific to context or relationship? Do they show more examples of good mentalising or are they more likely to display bad mentalising?

2. Create a mentalising profile of where the client sits on the four dimensions of mentalising. Researchers have created mentalising profiles about people with different psychopathologies: for example people with anorexia nervosa (AN) struggle to self-

mentalise, particularly about their own emotions, but can mentalise about other people effectively (Simonsen et al., 2020).

3. Individual thresholds for switching from controlled mentalisation to automatic mentalisation should be assessed, as well as the time it takes for people to return to .their baseline. This helps both clinicians and clients to pinpoint where improvements are needed most (for example, specific social situations). Many individual factors can reduce or increase someone's threshold for switching between controlled and automatic mentalising, particularly childhood experiences (Luyten & Fonagy, 2015).

4. Establish what happens when effective mentalisation fails – what are the "non-mentalising" modes that are activated for this individual, and how do they need to be addressed? They may fall into the non-mentalising mode of psychic equivalence and firmly believe that what they are feeling is real and true. Or they may enter the non-mentalising pretend mode, attributing extreme, unrealistic mental states to themselves and others.

5. Establish how mentalising impairments are affecting the client's capacity for epistemic trust and *salutogenesis* (the ability to benefit from the environment), as these factors will impact on the client's ability to make effective use of therapy.

Assessing mentalisation in this way gives clinicians an extensive understanding of their clients' impairments, and the tools to support individuals. However, as the authors recommend multiple sessions to fully assess each client's capabilities, assessment can take a very long time. This is not always practical, for clinicians in busy healthcare settings or for researchers looking to collect information from large numbers of people. Measures have been created to aid the assessment process, including self-reports, brief interviews and observations. These measures can focus on overall mentalising or more nuanced aspects, on severe impairments or minor problems in specific relationships. Measures have been created for different populations, including children and adolescents, people with a history of trauma, parents and even therapists. There are also many proxy measures that can be used to assess constructs that fall under the umbrella term of mentalisation like ToM, alexithymia, mindfulness or empathy, each of which has an extensive accompanying scientific literature.

The current models of measuring mentalising date back to the work of psychologists in the 1970s and 1980s who were interested in ToM and the development of children's understanding of other people's thoughts and feelings. Researchers such as Simon Baron-Cohen, Uta Frith and Alan Leslie conducted studies that showed that even very young children

have a rudimentary ability to understand that other people have beliefs and desires that may differ from their own (Baron-Cohen, 2000; Fatima & Babu, 2023; Happé, 2015). These studies often utilised the “false-belief tasks” paradigm, for example the Sally-Anne task (which tests a child's understanding that others can have false beliefs, through asking them to predict where a character will look for an object after it has been moved without the character's knowledge) (Baron-Cohen, Leslie & Frith, 1985). These tasks have successfully demonstrated that the skill of understanding others’ internal states develops through childhood, and that impairments in this skill are linked to mental health problems. However, there are multiple limitations to the paradigm, which led to researchers looking for alternative ways to measure concepts akin to mentalisation.

In the late 1980s, Peter Fonagy and colleagues at the Anna Freud Centre in London developed the Reflective Functioning Scale (RFS) (Fonagy, et al., 1998), one of the first manualised measures designed to assess mentalising in adults. The RFS assesses an individual’s capacity to reflect on their own and others’ mental states in a given situation or context. The RFS measures mentalisation based on transcripts from the Adult Attachment Interview (AAI) (George, Kaplan & Main, 1985) or the Parent Development Interview (PDI) (Slade et al., 2004; Slade et al., 2004), which are quasi-clinical semi-structured interviews that assess internal working models of attachment and parents’ representations of themselves. Trained coders score the RFS on an 11-point scale, from “anti-reflective” (limited ability to mentalise, relying heavily on external cues to interpret behaviours) and “exceptionally reflective” (demonstrates an excellent ability for mentalising, understanding and interpreting mental states with ease) (Anis et al., 2020). Self-mentalising is primarily rated from the AAI and focuses on how adults reflect on their childhood experiences; parental mentalising focuses on parents’ capacities for mentalising about their relationship with their child and is primarily rated using the PDI (Anis et al., 2020; Fonagy, et al., 1998; Taubner, Hörz et al., 2013). The RFS is considered the gold standard for measuring mentalisation, and is used extensively in research on attachment, personality, and psychopathology, as well as in studies of psychotherapy outcomes (Anis et al., 2020; Taubner, et al., 2013). However, the method is not without its drawbacks: the interview itself can take up to 2 hours, while transcribing and coding the interview transcripts can take 3-4 hours. The measure is therefore time-consuming and resource-intensive, making it difficult to use when conducting research with large participant samples.

Because of these methodological issues, there has been a move to looking for alternative ways to quickly and easily measure mentalisation. To do this, Patrick Luytens, Peter Fonagy and team developed the Reflective Functioning Questionnaire (RFQ) (Fonagy, et al., 2016).

The RFQ is a self-report measure of mentalising that asks individuals to rate their own ability to mentalise. It was developed to be a quick and easy-to-administer measure, to assess the severe imbalances in mentalising that are commonly observed in patients with severe mental health problems (Fonagy, et al., 2016). In its current iteration, there are 8 questions measuring mentalisation about oneself and others, assessed using a 7-point Likert scale. The measure is scored to yield two factors related to mentalising about the self and others: Certainty and Uncertainty. The Certainty subscale assesses the participant's certainty (or confidence) in their beliefs and assumptions about mental states in themselves and others. An example includes: "*I always know what I feel*"; extreme scores relate to hyper-mentalising (Fonagy, et al., 2016). The Uncertainty subscale assesses how concrete and rigid a participant is about the opaqueness of mental states, with high scores relating to hypo-mentalising corresponding to a complete lack of knowledge or understanding of mental states. An example includes: "*Sometimes I do things without really knowing why"* (Fonagy, et al., 2016).

The Parental Reflective Functioning Questionnaire (PRFQ) is a self-reported, multi-dimensional questionnaire designed to specifically assess parental mentalisation (Luyten et al., 2017). It consists of 18 statements that measure three key subscales, providing valuable insights into different aspects of reflective functioning. The Pre-Mentalising subscale (PM) assesses a parent's ability to interpret a child's behaviour without making inappropriate or incorrect assumptions about the child's intentions. Higher scores on this subscale suggest poorer mentalisation (Luyten et al., 2017). An example includes, *"The only time I'm certain my child loves me is when he or she is smiling at me*." The Certainty in Mental States subscale (CM) measures a parent's ability to recognise the limitations of their understanding of their child's thoughts and feelings. High and low scores, indicating certainty or uncertainty, respectively, suggest poorer mentalisation (Luyten et al., 2017). An example includes*, "I can always predict what my child will do*". The Interest and Curiosity subscale (IC) evaluates a parent's curiosity and willingness to understand their child's mental states. High and low scores, indicating a complete lack of interest or intrusive interest, respectively, suggest poorer mentalisation (Luyten et al., 2017). An example includes*, "I wonder a lot about what my child is thinking and feeling*." Each subscale comprises 6 statements, which are rated on a 7-point Likert scale, ranging from strongly disagree to strongly agree. The PRFQ has undergone rigorous psychometric evaluation to establish its validity and reliability (Luyten et al., 2017).

The Reflective Functioning Questionnaire for Youth (RFQ-Y) is a self-reported questionnaire designed to assess mentalisation in adolescents (Ha et al., 2013; Sharp et al., 2009). It consists of a series of statements that participants are asked to rate, based on their agreement or disagreement. The RFQ-Y aims to capture the adolescent's ability to understand their own

and others' mental states. The long-form questionnaire comprises 48 statements, each measured on a Likert scale typically ranging from 1 to 7, where 1 indicates strong disagreement and 7 indicates strong agreement (Ha et al., 2013; Sharp et al., 2009). A shortened version uses only 5 statements that cover various dimensions related to mentalisation (Sharp et al., 2022). In particular, the RFQ-Y measures adolescent ability for the self- and other-mentalisation, and cognitive and affective dimensions of mentalisation, rather than the external-internal and automatic-controlled dimensions. An example of a statement on both the long and short questionnaires is: "*I'm often curious about the meaning behind others' actions*". Low scores on the RFQ-Y typically indicate lower levels of mentalisation ability (Ha et al., 2013; Sharp et al., 2009). This brief version allows, for the first time, the potential inclusion of mentalisation in large epidemiological studies and cohorts.

1.2. Mentalisation and Mental Health

Research has demonstrated that individuals vary in their level of mentalisation ability depending on the emotional content of the situation. Evidence suggests that people have better mentalisation skills in neutral or positive emotional situations compared to negative emotional situations, possibly because negative emotions can impair cognitive processing and attention, making it more difficult to accurately perceive and interpret mental states. Individuals with higher levels of anxiety exhibited reduced mentalisation ability in response to negative emotions, particularly fear (Rutherford et al., 2015). Furthermore, research has demonstrated that individuals with certain mental health conditions, such as borderline personality disorder or depression, may experience difficulties with mentalisation across a range of emotional contexts (Bateman & Fonagy, 2019). These difficulties may arise from a variety of factors, including early attachment disruptions, trauma, or other environmental factors that impact the development of mentalisation. For instance, individuals with borderline personality disorder have significantly lower levels of mentalisation compared to healthy controls across both positive and negative emotional contexts (Allen, 2018). These findings suggest that mentalisation deficits may be a key factor in the development and maintenance of certain mental health conditions.

1.2.1 Autism Spectrum Disorders – Disorders of Mentalising?

Autism, also known as autism spectrum disorder (ASD), has long been associated with mentalising deficits, and is also frequently co-morbid with eating disorders (Baron-Cohen, 2000; Baron-Cohen et al., 2013; Tchanturia et al., 2013). ASD is a complex neurodevelopmental disorder that affects social interaction, communication, and behaviours (American Psychiatric Association, 2013). The main characteristics of autism include difficulty with social interactions, restricted and repetitive patterns of behaviours, interests, or activities,

and difficulties with sensory processing (American Psychiatric Association, 2013). Individuals with autism may have difficulty with nonverbal communication, such as making eye contact, using facial expressions and gestures, understanding tone of voice, and they may have difficulty understanding social cues and norms (American Psychiatric Association, 2013; Baron-Cohen, 2000; Fatima & Babu, 2023; Happé, 2015). They may also have challenges with verbal communication, such as understanding sarcasm, irony, and metaphors, and they may struggle to initiate and maintain conversations with others.

Historically, autism was often associated with a deficit in mentalising, especially ToM, particularly because people with autism may struggle with perspective-taking (i.e. seeing things from other people's point of view). The ToM hypothesis was first proposed by researchers like Uta Frith and Simon Baron-Cohen in the 1980s and has since been supported by numerous studies (Baron-Cohen, 2000; Fatima & Babu, 2023; Happé, 2015). According to the theory, individuals with ASD have difficulty understanding that other people have their own beliefs, desires, and intentions, and that these mental states may be different from their own (Baron-Cohen, 2000; Fatima & Babu, 2023; Happé, 2015). Much of the original evidence used to support this theory comes from use of "false-belief" tasks like the Sally-Anne task (Baron-Cohen, Leslie & Frith, 1985). Children are shown a scenario involving a doll who has a false belief about a situation (i.e. Sally thinks her marble is in one location when it has actually been moved to another location by Anne while Sally was out of the room). The child is then asked a series of questions (normally, "*where is the marble? Where was the marble in the beginning? Where will Sally look for her marble?*") to predict what the child thinks the character would do based on their false belief. Children with ASD perform worse on these types of tasks, compared to typically developing children, indicating a deficit in their understanding of other people's mental states (Baron-Cohen, Leslie & Frith, 1985; Leslie & Frith, 1988). This difficulty can make it challenging for individuals with ASD to predict or interpret the behaviour of others, leading to social communication and interaction difficulties. More recent studies using different research paradigms have also supported the idea that ToM deficits are exhibited by people with autism. For example, the Reading the Mind in the Eyes Task (RMET) is a commonly used test that aims to measure a person's ability to infer other people's mental states, specifically their emotional or mental states, by looking at the eye regions of pictures of faces (Baron-Cohen et al., 2001). One meta-analysis suggested that people with ASD consistently show poorer performance on the RMET compared to those without an ASD diagnosis (Peñuelas-Calvo et al., 2019). Mentalising tasks where participants are asked to interpret social behaviours in others, such as short-story tasks, can successfully differentiate between those with a diagnosis of ASD and those without, based on mentalising performance (Jarvers et al., 2023). Deficits in other aspects of mentalisation, such as low empathic abilities and high levels

of alexithymia, are also consistently demonstrated in people with ASD (Fatima & Babu, 2023; Kinnaird et al., 2019). Evidence such as this provides support for the ToM, or mentalising, hypothesis that individuals with ASD have a specific deficit in their ability to understand others' beliefs, intentions, and emotions, which leads to social difficulties. Indeed, some have suggested that ASD should be categorised as a "mentalising disorder", alongside schizophrenia, bipolar disorder and borderline personality disorder, and that deficits in mentalising are a core component of the psychopathology of ASD (Johnson et al., 2022).

However, while mentalisation deficits are present for many individuals with autism, it is not necessarily a defining feature of the disorder in the way that it was historically theorised (Baron-Cohen, Leslie & Frith, 1985; Baron-Cohen, 2000; Moessnang et al., 2020) . Recent research has suggested that social deficits seen in autism may be more complex and involve multiple cognitive and neural factors, including differences in attention, executive function and sensory processing. For example, it appears that performance on the RMET is negatively correlated with performance IQ (which measures an individual's nonverbal problem-solving abilities, such as spatial reasoning and visual processing) but only in people with ASD (Peñuelas-Calvo et al., 2019). It may be that people with ASD utilise different cognitive components when attempting to mentalise compared to those without ASD, suggesting that a divergent use of cognitive and neural factors may account for social communication problems, rather than a specific deficit in mentalising.

The universality of mentalisation deficits in ASD has also been brought into question by studies suggesting that not all people with autism exhibit the same pattern of mentalising deficits, and there have been some studies suggesting no difference in mentalisation between those with ASD and those without. For example, an fMRI study examining social brain correlates of mentalising found that when doing an animated shapes task, there was no clear-cut difference in activation in brain areas associated with active mentalising between people with an ASD diagnosis and those without (Moessnang et al., 2020). This type of result suggests that the social communication problems commonly exhibited by people with ASD are not directly related to problems with mentalising. Additionally, studies that have demonstrated the malleability of mentalising abilities provide evidence that poor mentalising, while associated with autism, may not be a fixed trait, as other traits synonymous with autism might be (such as repetitive behaviours or sensory processing issues). Indeed, there are some studies that suggest that mentalisation ability can be improved for people with ASD, through intervention. A study using a computer-based intervention demonstrated that when children with ASD received support practising eye-gaze, joint attention and facial recognition, all important components in the development of attachment and mentalisation there was significant

improvement in the children's ability to mentalise, regulate their emotions and use social skills (Rice et al., 2015). Another study using mentalisation-based therapy also showed that mentalisation abilities in people with ASD can be improved with professional support (Kraemer et al., 2021). Together, this evidence highlights that deficits in ToM as a hypothesis for social communication problems in ASD may not be complete, that poor mentalisation is not a "fixed" autistic trait, and that mentalisation is a useful treatment target for improving social communication skills and emotion regulation for people with ASD.

1.3 Eating Disorders

Millions of people worldwide are affected by eating disorders and disordered eating behaviours, their effects cutting across all demographics and leaving a trail of physical and emotional destruction in their wake. Their impact goes far beyond just food; eating disorders can strip individuals of their identity, relationships, and future aspirations. What drives the development of an eating disorder is still being understood, and it is important that research focuses on how we can help both prevent eating disorder development and support people who are struggling with an eating disorder on the road to recovery.

1.3.1. What is an Eating Disorder?

The Diagnostic and Statistical Manual of Mental Disorders (DSM-V) defines eating disorders as being,

> "*characterised by a persistent disturbance of eating or eating-related behaviour that results in the altered consumption or absorption of food and that significantly impairs physical health or psychosocial functioning*" (American Psychiatric Association, 2013).

The International Classification of Diseases (ICD-11) described eating disorders as involving:

> "*abnormal eating or feeding behaviours that are not better accounted for by another medical condition and are not developmentally appropriate or culturally sanctioned. Eating disorders involve abnormal eating behaviour and preoccupation with food accompanied in most instances by prominent body weight or shape concerns*" (World Health Organization, 2022).

There are many types of eating disorder (ED), but the most studied are Anorexia Nervosa, Bulimia Nervosa and Binge Eating Disorder.

Anorexia Nervosa (AN) is probably the most widely known ED, with high mortality rates and potential long-term physical effects if left untreated. The DSM-V defines AN as having 3 key criteria: restriction of energy intake resulting in a significantly low body weight, an

overwhelming fear of weight gain, and a distorted body image (American Psychiatric Association, 2013). AN manifests as physical, behavioural and psychological symptoms, including weight loss, lanugo, amenorrhea, food rituals, changes in behaviour around food, excessive exercise, excessive focus on calories and distorted body perception (Rosello et al., 2021). Recent research suggests that younger patients may show a preoccupation with obesity, the health consequences of unhealthy eating, and a focus on vegetarianism and veganism, often attributed to climate change concerns (Herpertz-Dahlmann & Dahmen, 2019). AN presents with one of the highest mortality rates among mental health conditions, at approximately 6% (Arcelus et al., 2011; Auger et al., 2021), related to death by suicide, pulmonary problems and organ failure (Auger et al., 2021). Even without it leading to death, untreated AN may have potentially irreversible long-term physical effects including fertility problems, weakened immune systems, and osteoporosis (Andrés-Pepiñá et al., 2020; Fichter et al., 2017; Keel et al., 2003). The majority of AN sufferers can attain full recovery, but it can take a long time (Dobrescu et al., 2020). Recent surveillance studies of secondary care suggest an incident rate of 13.68 per 100,000 population, with peak incidence at 15 years old for girls and 16 years old for boys (Petkova et al., 2019). The National Institute for Health and Care Excellence (NICE) guidelines recommend a range of evidence-based treatment options for AN, including cognitive behavioural therapy (CBT), specialist supportive clinical management (SSCM), and family-based therapy (FBT) (National Institute for Health and Care Excellence, 2020). In particular, FBT is recommended as the first line treatment option for children and adolescents with AN who live with their families.

Bulimia Nervosa (BN) is characterised by recurrent episodes of binge eating followed by inappropriate compensatory behaviours, especially vomiting, aimed at preventing weight gain, where the patient's self-worth is heavily influenced by their body weight and shape (American Psychiatric Association, 2013). Physical symptoms associated with frequent vomiting include swelling of salivary glands, tooth enamel erosion, and swelling of extremities. Other physical signs may include stomach problems, bloating, constipation, irregular periods, and weight fluctuation (Lydecker & Grilo, 2019; Stice et al., 2020; Wade, 2018). Young people with BN may exhibit behavioural and psychological symptoms before physical signs, including hoarding food, excessive exercise, secrecy around mealtimes, feelings of shame and guilt, loss of confidence and self-esteem, and excessive focus on food and weight (Lydecker & Grilo, 2019; Stice et al., 2020; Wade, 2018). Lifetime rates of BN vary depending on the population being studied, but research suggests that the lifetime prevalence of BN in the general population is around 1-2% for women and around 0.1% for men (Bagaric et al., 2020; Glazer et al., 2019; Keski-Rahkonen & Mustelin, 2016; Qian et al., 2022). However, these figures may be underestimates due to underreporting and the stigma surrounding EDs. It is

important to note that the prevalence of BN is higher among certain groups, such as individuals with a history of obesity or weight stigma and those with a history of trauma (Day et al., 2011; Monteleone et al., 2021). Additionally, the lifetime rates of subthreshold forms of BN, which may not meet the full diagnostic criteria but still involve disordered eating and compensatory behaviours, are likely higher than those of the full disorder (Chapa, Bohrer & Forbush, 2018). The NICE guidelines recommend a range of psychological interventions for the treatment of BN, including cognitive behavioural therapy (CBT), enhanced cognitive behavioural therapy (CBT-E), and interpersonal psychotherapy (IPT) (National Institute for Health and Care Excellence, 2020). The guidelines recommend that family-based therapy (FBT) or adolescent-focused therapy (AFT) be used as the initial treatment approach for young people with BN (National Institute for Health and Care Excellence, 2020).

Binge Eating Disorder (BED) was officially recognised as a distinct mental health condition in 2013 in DSM-V, despite binge-eating being included as a feature of EDs since 1994 (American Psychiatric Association, 2013). BED is characterised by recurrent episodes of binge-eating that are not followed by compensatory behaviours to prevent weight gain. Binge-eating episodes are characterised by consuming significantly more food in a short period of time than most individuals would under similar circumstances and are accompanied by a sense of lack of control overeating (American Psychiatric Association, 2013). BED, despite being less known than AN and BN, is equally, if not more, common in children and adolescents. Prevalence rates are estimated to be around 6% in community samples but may be as high as 16% in overweight or obese children (Kjeldbjerg & Clausen, 2021). Addressing BED is crucial, as it can prevent further weight gain escalation, even though its treatment is not directly linked to weight loss. Onset of BED is typically considered to occur in late adolescence, but some research has indicated that the average age of onset may be as low as 12 years old (Kjeldbjerg & Clausen, 2021). BED has been linked with negative health outcomes, such as hypertension, damage to the oesophagus, and gall bladder disease (Giel et al., 2022; Keski-Rahkonen, 2021). Risk factors associated with developing BED include weight-based harassment, dieting from a young age, childhood food insecurity, a history of neglect or abuse, and other traumatic childhood experiences (Keski-Rahkonen, 2021). The NICE guidelines recommend psychological interventions, such as cognitive behavioural therapy (CBT), interpersonal therapy (IPT), and guided self-help as the first-line treatment for BED (National Institute for Health and Care Excellence, 2020). For children and young people, family-based therapy and other age-appropriate psychological interventions should be considered as the first-line treatment (Keski-Rahkonen, 2021).

Adolescence is a critical period for the development of EDs due to the unique combination of biological, psychological, and sociocultural factors that converge during this developmental stage (American Psychiatric Association, 2013; Klump, 2013; Sawyer et al., 2012). The biological changes that occur during puberty, including hormonal shifts, changes in body composition, and altered brain development, may contribute to increased vulnerability to many different mental health problems, including EDs (Blakemore, 2008; Goddings et al., 2012). For instance, puberty-related changes can trigger a preoccupation with body image and weight, leading to excessive dieting, fasting, or purging behaviours. During adolescence, individuals are exposed to a variety of sociocultural pressures, including the media's promotion of unrealistic beauty standards and social pressures to conform to idealised body shapes (de Valle et al., 2021). These pressures can lead to negative body image and disordered eating behaviours, which may evolve into full-blown EDs (Levine & Smolak, 2016; Stice, Onipede & Marti, 2021; Walker, White & Srinivasan, 2018). Furthermore, adolescents who have a family history of EDs, a history of trauma or abuse, or struggle with mental health issues such as depression or anxiety, are at increased risk for developing an ED (Barakat et al., 2023).

Early-onset diagnosis is crucial in promoting effective treatment and recovery for individuals with EDs. Studies have consistently shown that early intervention is associated with better treatment outcomes and a higher likelihood of full recovery (Austin, Flynn et al., 2021a; Austin, Flynn et al., 2021b; Austin et al., 2022; Flynn et al., 2021; Fukui et al., 2020). Researchers suggest that the effectiveness of treatment for EDs may decline over time, as studies show that response to treatment tends to be stronger in the early stages of the illness and decreases as the disorder persists (Ambwani et al., 2020; Treasure & Russell, 2011; Treasure, Stein & Maguire, 2015). It is possible that this is due to the development of habitual behaviour patterns that can occur over time and contribute to the increasing severity and entrenched nature of EDs. Delayed or missed diagnosis can lead to chronicity, worsening of symptoms, and increased risk of medical complications (Austin, Flynn et al., 2021b; Keel et al., 2003; Smink, van Hoeken & Hoek, 2012). Additionally, early diagnosis can prevent the development of co-morbid conditions, such as anxiety, depression, or substance use disorders, which can further complicate the treatment process (Dalle Grave et al., 2019). Despite the benefits of early diagnosis, many individuals with EDs go undiagnosed or misdiagnosed for years, due to factors such as low awareness among healthcare providers, the secretive nature of the illness, or the lack of reliable diagnostic tools (Hilbert, Hoek & Schmidt, 2017; National Institute for Health and Care Excellence, 2020). Identifying disordered eating behaviours can be challenging, as societal norms that emphasise thinness and fitness can make it difficult to differentiate between normal diet and exercise practices and disordered eating patterns (Dignard & Jarry, 2021; Griffiths et al., 2018). For example, calorie counting and food

restriction may be perceived as healthy and commendable methods for weight management, but when taken to an excessive or obsessive degree they can result in disordered eating patterns and detrimental health outcomes (Barakat et al., 2023). Similarly, compulsive exercising or rigorous workout routines can be seen as admirable and desirable by society, yet when used as a method of purging or compensating for food intake, they can also lead to disordered eating patterns. Additional symptoms of disordered eating include binge eating, irregular eating patterns, negative body image, preoccupation with weight and body shape, and social isolation (Glazer et al., 2019; Marks, De Foe & Collett, 2020).

Together, the literature suggests that it is important that EDs are identified early, a systemic approach is taken towards treatment, and focus is on psychosocial functioning, alongside physical health. It also suggests that understanding factors associated with the development of an ED are important, to reduce the chances of long-term morbidity that can significantly affect people's lives, or even result in premature death.

1.3.2 Risk and Protective Factors against ED Development

According to some estimates, approximately 10% of the general, worldwide population will develop an ED at some point in their lifetime. While individuals of all ages, genders and ethnicities may be affected by an ED, onset typically occurs in adolescence. For AN, peak incidence is 15 years old for girls and 16 years old for boys (Petkova et al., 2019), although there is a significant minority of first-time patients who are younger than 13 years old (Nicholls, Lynn & Viner, 2011). Peak incidence for BN may be 17 years old (Volpe et al., 2016), while for BED, onset typically occurs after the age of 16 (Favaro et al., 2019).

Many different behaviours are associated with a disordered relationship with food and weight, including excessive exercise, post-meal vomiting, laxative overuse, dietary restriction, bingeing, rigid routines and obsessive body-checking (Kärkkäinen et al., 2018). Thought patterns that have been identified as being related to disordered eating include: fear of weight gain; feeling fat despite others informing them they are not; preoccupation with weight, shape, and appearance; body dissatisfaction and negative self-image; and negative affect associated with eating behaviours (Fairburn & Beglin, 2008). These behaviours are prevalent among individuals diagnosed with EDs, but they are also exhibited by people struggling with other mental health problems, including obsessive compulsive disorder, borderline personality disorder and depression (De Paoli et al., 2020; Drakes et al., 2021; Garcia et al., 2020; Khosravi, 2020; Lekgabe et al., 2021; Lulé et al., 2014). Additionally, disordered eating symptoms are not uncommon in people struggling with physical problems including diabetes, chronic pain and polycystic ovary syndrome (Amy & Kozak, 2012; Lee et al., 2019; Nilsson et al., 2020; Pianucci et al., 2021; Pursey et al., 2020). Indeed, some research suggests that

disordered eating behaviours are observed in the non-clinical population, with studies consistently reporting that disordered eating behaviours and cognitions are worryingly high amongst adolescents in particular (Swanson et al., 2011). For example, up to 45% of adolescent males report behaviours including skipping meals and over-exercising (Wilksch et al., 2020); by the age of 16, over 40% of adolescent females report regularly engaging in behaviours including fasting, purging or binge-eating (Bould et al., 2018). Of those reporting regular behaviours, 11% are engaging at such a high level, they could meet the DSM-V criteria for an ED (Bould et al., 2018). However, lifetime prevalence estimates suggest that not everyone who engages in disordered eating behaviours will develop a full-blown ED, leaving the question – who is most at risk of developing one and what protects others from developing one? (Bagaric et al., 2020; Keski-Rahkonen & Mustelin, 2016; Keski-Rahkonen, 2021; Swanson et al., 2011; Udo & Grilo, 2018).

Various biological and childhood factors have long been associated with an increased risk for developing an ED, including adolescence and young adulthood, being female, family history of obesity and childhood abuse (Le et al., 2017). Regardless of ethnic identity, girls are more likely to report disordered eating behaviours, while boys from an ethnic minority group are more likely to report engaging in purging and fasting than White boys (Beccia et al., 2019). In terms of risk for binge-eating, having a psychiatric co-morbidity, being a member of a minority group and being unemployed were all risk factors for adults, particularly during the COVID-19 pandemic (Davies et al., 2023). These were also risk factors for being low weight and for self-harm, suggesting that disordered eating and self-harm behaviours may be used as coping mechanisms during times of stress and uncertainty (Davies et al., 2023). Many of these risk factors are considered to be stable and resistant to modification, so it is important to identify factors that can be changed to reduce the risk of disorder development (Le et al., 2017).

Self-compassion, intuitive eating and positive body image can predict reduced probability of displaying disordered eating behaviours including binge-eating, purging and fasting at 8-month follow-up (Linardon, 2021). Greater improvements in intuitive eating and body appreciation over time were also associated with reduced likelihood of experiencing binge-eating, fear of weight gain and driven exercise (Linardon, 2021). The protective nature of self-compassion may lie in its relationship with core aspects of body image, namely overvaluation of shape and weight. In a cross-sectional study of over 900 adults, it was found that self-compassion moderated the relationship between disordered eating behaviours and overvaluation (Linardon et al., 2020): for those with lower self-compassion, overvaluation of shape and weight was strongly associated with disordered eating behaviours, but these relationships were weak or absent for participants with high self-compassion (Linardon et al.,

2020). For adolescents in particular, there appears to be a positive relationship between self-compassion and body satisfaction, and a negative relationship between self-compassion and psychological distress and eating pathology (Pullmer, Coelho & Zaitsoff, 2019); longitudinal analysis suggests that self-compassion predicts better body satisfaction and reduced disordered eating through the reduction of psychological distress, although this appears to only be the case for girls (Pullmer, Coelho & Zaitsoff, 2019).

Body dissatisfaction has been identified as a significant risk factor for the development of EDs across different cultures, and across genders (Stice, 2002). A longitudinal study of adolescents in China found that negative evaluation of one's body and pressure to adhere to society's beauty ideals significantly contribute to ED development for both adolescent boys and girls (Jackson & Chen, 2014). Preoccupation with having a thin body was also an important risk factor for developing an ED amongst Hispanic adolescents (McKnight Investigators, 2003), adding further evidence to the idea that negative feelings about one's body put young people at high risk of disordered eating onset.

Drive for thinness and body dissatisfaction should be considered both risk and protective factors: a positive attitude towards one's body and size during early adolescence appears to provide protection against EDs when followed up after 5 years, whereas dissatisfaction with body size and a drive for thinness may be related to an increased risk of future development of an ED (Gustafsson et al., 2010). Positive self-evaluation and attitude towards one's body are associated with healthier attitudes towards eating in adolescent girls after 5 years (Gustafsson et al., 2009). Dieting and being teased by one's family about weight were strongly related to binge-eating behaviours, being overweight and use of extreme dieting behaviours at 5 years follow up. Family meals and self-esteem are associated with reduced likelihood of disordered eating (Neumark-Sztainer et al., 2007). It can be inferred that there may be shared risk factors for disordered eating behaviours and obesity, which implies that studying these risk factors together may lead to more effective prevention strategies for both conditions.

Poor family functioning is associated with higher risk for disordered eating, but this relationship appears to be mediated by self-esteem. Mediation analyses have suggested that poor family functioning predicts poor global self-esteem, which in turn predicts an increased risk for developing an ED (Kroplewski et al., 2019). Children of mothers who have been diagnosed with an ED, particularly AN or BN, exhibit more feeding and eating problems, and heightened socio-economic difficulties, factors which are associated with later diagnosis of an ED (Martini, Barona-Martinez & Micali, 2020).

An umbrella review of meta-analyses noted that consistent factors associated with increased risk for diagnosis of an ED include aspects of perfectionism and disordered attitudes towards body image and eating amongst family members (Hazzard et al., 2022). A robust and consistently found protective factor against EDs was high self-esteem.

A number of interventions have been designed to try to prevent the development of EDs, which draw on research on risk and protective factors (STICE). For example, interventions using mindfulness and addressing perfectionism have yielded promising results in terms of reduced ED cognitions and behaviours. Some of these identified factors correlate well with mentalisation (Bizzi et al., 2022; Calaresi & Barberis, 2019; Meyer & Leppma, 2019; Osborne et al., 2023), raising the question of the role of mentalisation in the prevention of EDs.

1.3.3 Autism and Eating Disorders

Interest in the relationship between ASD and EDs has greatly increased over the last few decades. There are high rates of ASD, both diagnosed and undiagnosed, in young people with EDs, particularly AN: one study estimated that approximately 10% of young people receiving ED treatment had a co-morbid ASD diagnosis, with most receiving their diagnosis while receiving ED treatment (Bentz, Pedersen & Moslet, 2022). Patients with AN have been found to display high levels of autistic-like traits, with some studies reporting a prevalence of potential ASD ranging from 8% to 28% among AN patients (Carpita et al., 2022). While there was no difference in treatment duration or rates of weight restoration (achieving a normal weight through treatment) between young people with AN and ASD, and young people with AN but not ASD, half of the AN/ASD patients needed intensified care, compared to only 16% of young people with just AN (Bentz, Pedersen & Moslet, 2022).

People with ASD often exhibit eating behaviours that could be considered "disordered", including repetitive intake of the same foods, picky eating, sensory-based selective eating and rigid rules around eating (Nimbley, Maloney & Duffy, 2023); these factors are associated with future diagnosis of an ED (Herle et al., 2020). Abnormalities in sensitivity to different aspects of food and food intake (e.g. smell, taste, etc.) predict both levels of ASD eating behaviours and ED symptomatology in adults (Nisticò et al., 2022), suggesting that problems with sensory perception play a role in the development of unusual or even dangerous eating behaviours.

Patients with EDs, particularly restrictive EDs, show neurocognitive and behavioural profiles similar to those seen in individuals with ASD, including rigidity in set-shifting tasks, greater attention to detail, deficits in and altered social cognition and functioning (Carpita et al., 2022; Dell'Osso et al., 2018; Pooni et al., 2012; Oldershaw et al., 2011). This has led some academics to suggest that AN might be a version of ASD (Oldershaw et al., 2011). However,

while co-morbidity is high, there are still a significant number of patients with restrictive EDs who do not meet the criteria for an ASD diagnosis; equally, the presence of autistic traits is not limited to AN, as patients with other forms of feeding and EDs may also display such traits (Carpita et al., 2022; Dell'Osso et al., 2018). This suggests that ASD and EDs are distinct conditions.

While many people with EDs display social impairments and problems with executive functioning like cognitive flexibility, it is not clear whether these characteristics are caused by undiagnosed ASD and stable personality traits, or by the starvation, anxiety and low mood that are associated with EDs (Mandy & Tchanturia, 2015). Some have suggested that EDs may be driven by autism-specific risk factors (Babb et al., 2021; Brede et al., 2020; Mandy, 2022). In one study of women with EDs, two thirds met the threshold for an autism diagnosis, with parents and patients agreeing that social impairments and neurodevelopmental difficulties predated the ED (Mandy & Tchanturia, 2015). One study suggested that people with AN who show high levels of ASD traits show similar ED symptom improvement when compared to those with AN but no ASD traits (Nazar et al., 2018). However, while both groups show improvements in social difficulties after 12 months, for the ASD traits group, social difficulties remained high (Nazar et al., 2018). This suggests that social difficulties may be life-long traits, rather than traits that are caused by restriction-induced starvation; evidence like this suggests that EDs are more likely to develop from problems with social difficulties, rather than cause their existence.

While some researchers suggest that AN could be a phenotype of ASD, others propose a broader psychopathological model that considers a neurodevelopmental alteration as the basis of all psychiatric disorders, including both EDs and ASD (Carpita et al., 2022). A potential factor contributing to the link between the two disorder categories may be the ability for mentalisation.

1.4 Mentalisation and EDs – what do we know?

1.4.1 An Overview

Finn Skårderud, the Norwegian psychiatrist, has written extensively about the connection between EDs and mentalisation, maintaining that difficulties in mentalising contribute to the development and maintenance of EDs (Robinson, Skårderud & Sommerfeldt, 2017; Skårderud, 2007a; Skårderud, 2007b). Skårderud has suggested that individuals with EDs often struggle to understand and regulate their own internal states, and struggle to correctly interpret the mental states of others; these impairments can lead to distorted beliefs about body image and self-worth (Bateman & Fonagy, 2019; Skårderud, 2007a; Skårderud, 2007b).

People with EDs may then rely on disordered eating behaviours to cope with emotional distress and regulate themselves, to gain a sense of control, which ultimately perpetuates the cycle of disordered eating. Skårderud posits that therapeutic intervention should focus on supporting patients to improve their mentalising abilities to disrupt this cycle (Allen, Fonagy & Bateman, 2008; Bateman & Fonagy, 2019; Robinson, Skårderud & Sommerfeldt, 2017; Skårderud, 2007a; Skårderud, 2007b). While Skårderud's theories are compelling, the research evidence suggests that the picture may in fact be less clear.

A number of systematic reviews and meta-analyses have been published, looking at different dimensions of mentalisation in people with EDs (Jewell, et al., 2016; Kerr-Gaffney, Harrison & Tchanturia, 2019; Preti et al., 2022; Saure et al., 2020). Recently, Simonsen and colleagues demonstrated that patients with EDs show higher rates of alexithymia, but roughly equal levels of ToM, compared to healthy controls (Simonsen et al., 2020). This suggests that people with EDs show poorer mentalisation about themselves, but their ability to mentalise about others may not be impaired.

Using latent profile analysis, Gagliardini et al suggested there are four profiles of impairment in people with EDs, that cut across the four polar dimensions of mentalisation (Gagliardini et al., 2020). The Affective-Self-Automatic profile is characterised by an inability to reflect cognitively on mental states, particularly about oneself, because their capacity for reflection is overwhelmed by affective mentalisation. People who fit the External profile focus almost exclusively on external cues of mentalisation (i.e. facial expressions, non-verbal behaviour, etc.). Those who fit the Cognitive-Self-Automatic profile may be over-involved in cognitive mentalisation and self-focused mentalisation, and struggle to adopt the perspective of others. Finally, for the Cognitive-Other-Automatic profile, people may again be overly focused on cognitive, rather than affective, mentalisation but also struggle to mentalise about themselves as they focus more on others' minds, rather than their own (Gagliardini et al., 2020). Interestingly, these profiles spanned the different ED diagnoses, with no profile clearly associated with just one ED (Gagliardini et al., 2020). This gives rise to two possible conclusions: 1. EDs can be classified in relation to dimensions of mentalising, rather than just clinical diagnosis – this could assist in treatment personalisation; and 2. deficits in mentalisation are seen across the spectrum of EDs, suggesting that poor mentalisation is a transdiagnostic risk factor.

Research has shown that having a positive mental representation of one's parents, and better ability for mentalising in respect to parents, predicts a reduction in emotional distress, which predicts lower ED severity; this indirect relationship suggests that feelings of benevolence and care towards one's parents, particularly towards a father figure, may protect adolescents from

developing severe disordered eating behaviours (Rothschild-Yakar, Waniel & Stein, 2013). Poor quality relationships with parents is also associated with higher risk for an ED, although only if mentalisation ability is low (Rothschild-Yakar, et al., 2010). These results add further credence to the theory that family relationships are important when it comes to predicting ED risk, and that mentalisation is likely to play an important role.

1.4.2 Specific Eating Disorder Diagnosis and Mentalisation

The majority of research into mentalisation and EDs has focused on AN. Oldershaw and colleagues (Oldershaw et al., 2010) examined the stability of poor mentalising by comparing currently ill AN patients and recovered AN patients against healthy controls. The study found that recovered AN patients performed well on mentalising tasks related to others, significantly outperforming currently ill patients. The recovered group performed similarly to healthy controls, indicating a restoration of mentalising abilities. However, when it came to emotion recognition, while recovered patients were better than currently ill patients, they performed worse than healthy controls at recognising positive emotions, suggesting that some impairments in mentalisation do not improve to "healthy" levels in recovery. Rothschild-Yakar and colleagues have conducted several studies investigating the relationship between mentalisation and AN (Rothschild-Yakar et al., 2022; Rothschild-Yakar, et al., 2018; Rothschild-Yakar, et al., 2010; Rothschild-Yakar, et al., 2011; Rothschild-Yakar, et al., 2019; Sarig-Shmueli et al., 2023). In one study, it was found that inpatients with AN had lower levels of emotional ToM and overall mentalising abilities, compared to those without EDs (Rothschild-Yakar et al., 2022). The relationship was mediated by interpersonal mistrust, suggesting that improving mentalisation could potentially enhance trust in the AN patient's therapist, leading to improvements in AN symptomatology. A 2019 study revealed that, while patients with AN show impaired mentalising abilities and high levels of alexithymia, they did not demonstrate any disturbances in ToM ability (Rothschild-Yakar, et al., 2019). Interestingly, the same study demonstrated that better mentalising ability predicts lower ED severity, while alexithymia predicted greater ED symptomatology (Rothschild-Yakar, et al., 2019).

In EDs other than AN, one study showed that it is possible to distinguish people with BED from those without, in a sample of normal weight women (Maxwell et al., 2017). Lower levels of mentalisation, assessed using the Adult Attachment Interview (AAI) (George, Kaplan & Main, 1985) and the Reflective Functioning Scale (RFS) (Fonagy, et al., 1998), predicted having BED. The authors suggested poor mentalisation interferes with interpersonal relationships, which means that individuals may struggle to seek and ask for support from others; this may lead to a need for maladaptive coping mechanisms for emotion regulation, like binge-eating (Maxwell et al., 2017). Additionally, Compare et al. demonstrated that mentalisation ability can

be improved through emotion-focused therapy for people with BED, providing further evidence for the theory that maladaptive emotion regulation is related to the ability to mentalise (Compare et al., 2018).

For those struggling with BN, the evidence is mixed. Some studies suggest that on average there is no difference in the mentalisation ability of those with BN compared to those without BN (Pedersen et al., 2012). However, on further examination, it appears that, in comparison to healthy controls, there was significant heterogeneity within the BN sample, with half exhibiting poor mentalisation. This was also demonstrated in another study, which suggested there is a sub-group of patients with BN who show good mentalisation, and a sub-group who show poor mentalisation (Mathiesen et al., 2015). The results suggest that there is a polarisation in mentalisation ability in patients with BN, which is not seen in other samples (like AN). Other studies have suggested that high mentalisation scores correlate with low alexithymia scores, but not with improved ability to regulate emotions (e.g. impulse control) (Mathiesen et al., 2015). This suggests that a sub-group of patients with BN may be able to explain and understand their own mental states but are unable to regulate their emotions. The authors have suggested that these patients may exhibit controlled, cognitive mentalisation at the same time as they exhibit poor implicit mentalisation (Mathiesen et al., 2015).

1.4.3 Individual Aspects of Mentalisation

Regarding Theory of Mind, Bora and Köse conducted a meta-analysis demonstrating that there are differences in types of ToM deficits depending on both ED diagnosis and ED severity (Bora & Köse, 2016). Patients with BN showed deficits in cognitive perspective-taking (inferring mental states in others), but not in decoding (processing affective stimuli) (Bora & Köse, 2016). Patients with AN showed impairments in both cognitive perspective-taking and decoding, with the most severe deficits seen in patients with acute AN (Bora & Köse, 2016). Longer duration of illness and lower BMI were also associated with more severe impairments on both these types of ToM (Bora & Köse, 2016). These results suggest that deficits in mentalisation, operationalised through ToM, may be both a trait related to EDs (as many recovered participants still showed significant deficits) (Bora & Köse, 2016) and also a consequence of EDs (demonstrated by the relationship between BMI, illness duration and ToM deficits) (Bora & Köse, 2016).

Empathic abilities correlate with aspects of EDs: empathy is negatively associated with body dissatisfaction and ED symptom severity, and positively associated with BMI (Konstantakopoulos et al., 2020). Recently, Konstantakopoulos and colleagues demonstrated that both patients with AN and patients with BN display impaired overall empathy abilities

(Konstantakopoulos et al., 2020). The study measured both self-reported empathy and task-related empathy, and found that patients with AN lacked awareness of their impairment on task-related empathy, demonstrated through a mismatch with self-reported empathy (Konstantakopoulos et al., 2020). This suggests that not only do patients with AN show diminished ability for empathy, but they are also not able to accurately appraise their own abilities (Konstantakopoulos et al., 2020). Being unable to correctly estimate your ability for empathy will impact social functioning and therefore relationships with others. Overvaluing your empathic skills may make you overly certain about others' perspectives, while undervaluing them may prevent you from feeling comfortable interacting with others.

One study examined adolescents with AN going through family-based therapy and found that, while overall mentalisation at baseline did not predict treatment outcome, higher scores on an alexithymia measure at baseline predicted good treatment outcome (Jewell, et al., 2021). These results fit in with adult studies on alexithymia and AN, suggesting that people with AN can mentalise about other people, but struggle to mentalise about themselves.

Interoceptive awareness (the ability to recognise and interpret one's internal bodily sensations) is a concept that is closely related to mindfulness and mentalisation (Hübner et al., 2021; Ondobaka, Kilner & Friston, 2017). There is evidence that interoceptive awareness ability can predict the onset of disordered eating behaviours: better ability to identify internal sensations at baseline predicted having a healthy relationship with eating at 5-year follow-up (Gustafsson et al., 2010). It has been hypothesised that being able to identify internal sensations and interpret these correctly may be related to better emotion regulation, allowing for better use of coping strategies, rather than reliance on unhelpful behaviours (Gustafsson et al., 2010). Equally, mindfulness may act as a protective factor against disordered eating behaviour, through a reduction in weight and appearance dissatisfaction and distress related to perceived sociocultural pressures (Atkinson & Diedrichs, 2021).

1.4.4 Mentalisation, EDs and Adolescence

While there has been significant interest in the relationship between mentalisation and disordered eating, there have been few studies that have looked at the relationship in children and adolescents. Adolescence is a pivotal time in both the development of mentalisation (Blakemore, 2008; Goddings et al., 2012) and of EDs (Klump, 2013). It should therefore be considered an important life stage for both concepts, which warrants further research attention. A systematic review in 2016 found only 7 studies that examined the relationship between mentalisation and EDs (Jewell, et al., 2016). These studies mostly focused on emotion recognition, which is one aspect of mentalisation, rather than overall mentalisation

(Jewell, et al., 2016). They also focused almost solely on AN, and normally acute AN which required hospitalisation; these bias the results towards more severe ED presentations, so making results less generalisable. Of the studies that Jewell and colleagues reviewed however, there was great heterogeneity in the results. Two studies suggested that adolescents and adults with ED (mostly AN) showed reduced overall recognition of emotions (Zonnevijlle-Bendek et al., 2002; Zonnevylle-Bender et al., 2004) while other studies found that adolescents with AN only struggled to recognise sadness (Lang et al., 2015) and disgust (Lulé et al., 2014) but were good at recognising happiness (Lulé et al., 2014). When looking at general mentalisation rather than just emotion recognition, Cate et al. demonstrated a negative relationship between risk of ED and mentalisation, and between risk of ED and attachment security (Cate et al., 2013). Rothschild and colleagues (Rothschild-Yakar, Waniel & Stein, 2013) demonstrated that inpatients with ED (mostly AN) hold more malevolent representations about their parents and demonstrate worse mentalisation than healthy controls. They also demonstrated that better mentalisation skills and positive representations of fathers predicted reduced emotional distress and, in turn, fewer symptoms of ED. Finally, a study using fMRI during ToM tasks (Schulte-Rüther et al., 2012) showed that, while there was no difference between adolescent inpatients with AN and healthy controls in terms of mentalisation, patients with AN showed reduced activation in areas of the brain that are normally associated with mentalisation and this lack of activation at baseline was associated with poorer clinical outcome. These results suggest that at least some aspects of mentalisation are important in adolescent ED, but it is still unclear about the full extent of mentalisation's role.

Since Jewell et al.'s systematic review was published, there have been several studies that investigated the relationship between mentalisation and EDs in adolescents. Cortes-Garcia et al. examined inpatients with EDs and found lower levels of attachment security and higher levels of hyper-mentalising compared to healthy adolescents (Cortes-Garcia, et al., 2021). Hyper-mentalising was found to mediate the association between insecure attachment and ED symptoms. In a second study, Cortes-Garcia et al. again found that inpatients with AN exhibited higher levels of hyper-mentalising compared to individuals without AN (Cortes-Garcia, et al., 2021). Having a co-morbid diagnosis of BPD was associated with a more pronounced level of hyper-mentalising, suggesting that hyper-mentalising may be particularly pronounced in adolescents with AN and co-morbidities (Cortes-Garcia, et al., 2021). It is not clear, however, whether poor mentalisation exacerbates psychiatric symptoms or mentalisation is affected by the symptoms of each diagnosis.

Family-based therapy is the gold standard treatment for EDs in children and adolescents, and one study investigated the role of *parent* mentalisation in a child's treatment for AN. Jewell et

al. found that child *and* parent mentalisation at beginning of treatment predicted clinical outcomes at 9 months (Jewell, et al., 2021). Specifically, for parents, high certainty about mental states predicted poor treatment outcome; for adolescents, lack of emotional clarity, which corresponds with alexithymia, predicted better treatment outcomes (Jewell, et al., 2021). Additionally, adolescent overall ability for mentalisation at baseline was found to predict therapeutic alliance at one month, which in turn predicted treatment outcomes (Jewell, .et al., 2021). These results suggest that for ED treatment, it is important to focus on mentalisation ability in family members as well as adolescents, and that there may be a relationship between mentalisation, therapeutic alliance and ED outcomes, which warrants further attention.

To my knowledge, there is only one study that has examined mentalisation and disordered eating in adolescents *without* EDs. Quattropani et al. conducted a study with Italian adolescents attending school or college and found that higher levels of uncertainty about mental states were associated with an increased risk for developing an ED (Quattropani et al., 2022). This study suggests that (a) the relationship between poor mentalisation and disordered eating is apparent before ED diagnosis, and (b) ED prevention programmes should look at ways to improve adolescent certainty about mental states to potentially reduce the risk of developing an ED. This study only examined certainty/uncertainty in mental states, which is only one aspect of mentalisation; therefore, further research should expand on these findings by including multiple measures.

1.5 Summary and outline of this thesis

The capacity to comprehend the mental states of both oneself and others (mentalisation) is crucial for promoting psychological well-being and facilitating positive interpersonal relationships (Allen, Fonagy & Bateman, 2008). While mentalisation is a pre-wired cognitive process, it is a skill that develops and manifests in different individuals, as it develops primarily in the context of social connections, particularly during adolescence (Blakemore, 2008; Dumontheil, Apperly & Blakemore, 2010; Fonagy, Gergely & Jurist, 2018). By recognising and responding to social cues, mentalisation enables individuals to effectively belong to social groups (Luyten et al., 2020a).

The ability of parents to reflect on their own mental states and those of their children is referred to as parental mentalisation (Slade, 2005). This skill is linked to higher levels of parental satisfaction and better quality of care, both of which are crucial for the development of social skills in children. Poor mentalisation in parents can predict negative outcomes for children undergoing ED treatment (Jewell, et al., 2016; Jewell, et al., 2021). However, studies have shown that parental mentalisation can be improved with the help of therapeutic intervention, which can have positive effects on children (Donnelly et al., 2023).

Inadequate mentalisation is linked to both poor mental health and autism (Bateman & Fonagy, 2019); there is debate regarding the responsiveness of mentalisation to therapeutic interventions, as the skill may be considered a fixed trait of ASD (Baron-Cohen, Leslie & Frith, 1985; Baron-Cohen, 2000; Happé, 2015). Some experts argue that mentalisation can be modified, citing evidence suggesting that individuals in recovery from an ED exhibit greater mentalisation and fewer autistic traits compared to those currently undergoing treatment (Oldershaw et al., 2010). Approximately 10% of the population may be affected by EDs during their lifetime, with disordered eating behaviours (such as binge-eating, food restriction, purging, and excessive exercise, among others) common among non-clinical populations (Bould et al., 2018). Such behaviours increase the risk of developing a full ED diagnosis (Austin et al., 2022; Barakat et al., 2023; Fukui et al., 2020; Treasure & Russell, 2011). Due to the high relapse rates and elevated mortality associated with EDs, early intervention is critical. Therefore, prioritising the early identification of individuals at elevated risk for EDs and identifying potential new treatments are important targets in research.

Clinicians frequently report that young people with EDs experience difficulties with mentalisation; however, the research in this area is inconclusive. Most studies have focused on adult or inpatient populations, so it is difficult to make conclusions about how mentalisation changes and impacts treatment outcomes for adolescents who are not in hospital. Nonetheless, research suggests that mentalisation can act as a protective factor against EDs, as higher mentalisation scores at baseline correlate with lower ED symptoms in adults (Rothschild-Yakar, et al., 2019). Additionally, adult patients with higher levels of mentalisation are more responsive to therapeutic techniques than those with poor mentalisation (Maxwell et al., 2017). In adults, for example, group psychotherapy has been shown to improve mentalisation for those with binge-eating disorder (BED) (Compare et al., 2018). Equally, parent mentalisation appears to play a role in treatment for adolescent EDs, with parental certainty about mental states predicting poor outcome (Jewell, et al., 2021). However, it remains unclear how any change in mentalisation, either for young people with EDs or their parents, can impact treatment outcomes. It also remains unclear whether better mentalisation acts as a protective factor against ED development in adolescents.

The existing literature encounters a significant challenge in delineating causality amidst the intricate interplay among facets of mentalisation, disordered eating behaviours, and ASD. The bidirectional influences among these variables remain largely unexplored, adding complexity to disentangling causal relationships. While mentalisation's contribution to fostering psychological well-being and facilitating social integration is apparent in prior works (Allen, Fonagy & Bateman, 2008; Blakemore, 2008; Luyten et al., 2020a), studies have primarily

focused on establishing associations and correlations rather than establishing clear causal pathways.

This limitation impedes definitive assertions regarding whether poor mentalisation directly causes or merely correlates with the development or exacerbation of EDs or ASD. The association observed between parental mentalisation and outcomes in children undergoing ED treatment poses crucial questions regarding causation versus correlation (Jewell, et al., 2016; Jewell, et al., 2021). Additionally, ongoing debates surrounding the responsiveness of mentalisation to therapeutic interventions, notably in ASD (Bateman & Fonagy, 2019), remain inconclusive. While empirical evidence suggests modifiability, evidenced by individuals in ED recovery exhibiting enhanced mentalisation and fewer ASD traits (Oldershaw et al., 2010), this association requires further investigation to delineate causal pathways. The prevalence of disordered eating behaviours across diverse populations underscores the urgency for early identification and intervention (Barakat et al., 2023; Treasure & Russell, 2011). However, limitations in current research, particularly concerning adolescents outside inpatient settings, impede comprehensive insights into mentalisation changes and treatment outcomes. Observed correlations between higher baseline mentalisation scores and reduced ED symptoms hint at a potential protective role but stop short of establishing causality (Rothschild-Yakar, et al., 2019). Similarly, the correlation between parental mentalisation and treatment efficacy in adolescents with EDs necessitates further investigation into causal mechanisms (Jewell, et al., 2021). While interventions, such as those by Compare et al. (2018), demonstrate enhancements in mentalisation abilities through therapy, establishing a clear causal link between improved mentalisation and symptom amelioration remains uncertain. Ultimately, disentangling causation from correlation within this intricate network of relationships remains a paramount challenge, urging the adoption of more nuanced methodologies and longitudinal studies to unravel causal pathways between mentalisation, EDs, and ASD.

Drawing from both my clinical experience in supporting young individuals with eating disorders (EDs) and a comprehensive review of existing literature, I have formulated a framework that clarifies the potential influence of mentalisation development on the emergence of disordered eating behaviours and how traits associated with ASD can influence these relationships. Illustrated in Figures 1.1 and 1.2, this framework guides my research, offering a unique perspective on these complex connections.

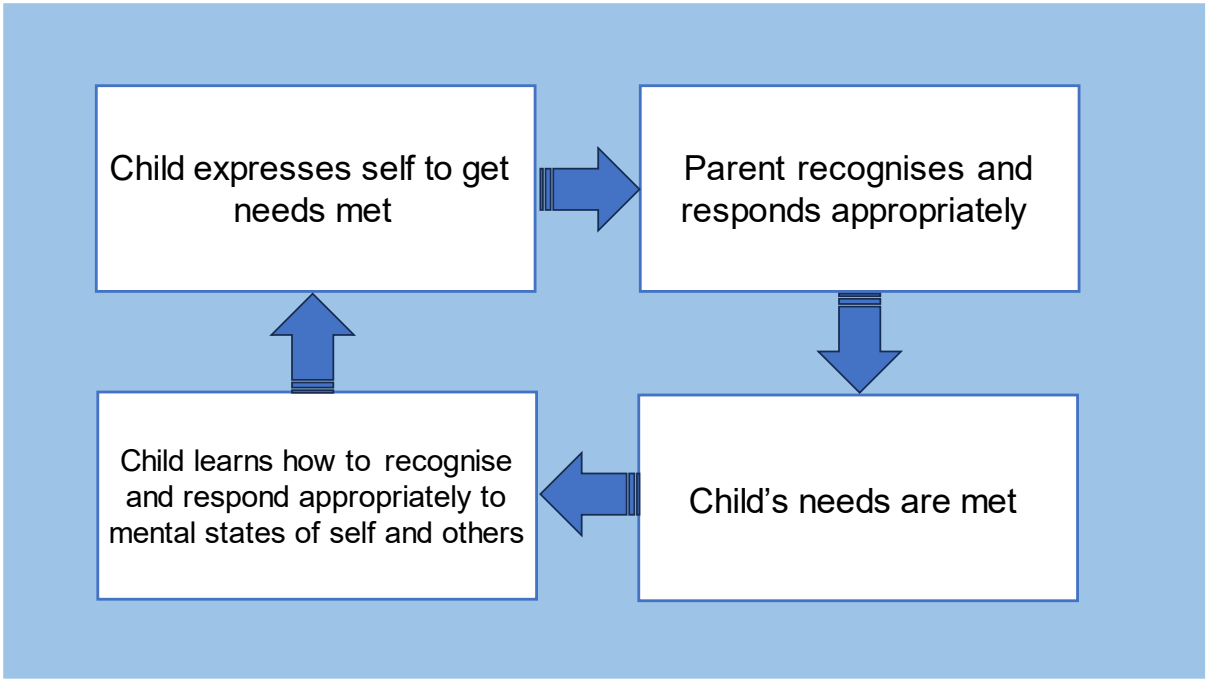

Figure 1.1. Framework for the development of good mentalisation.

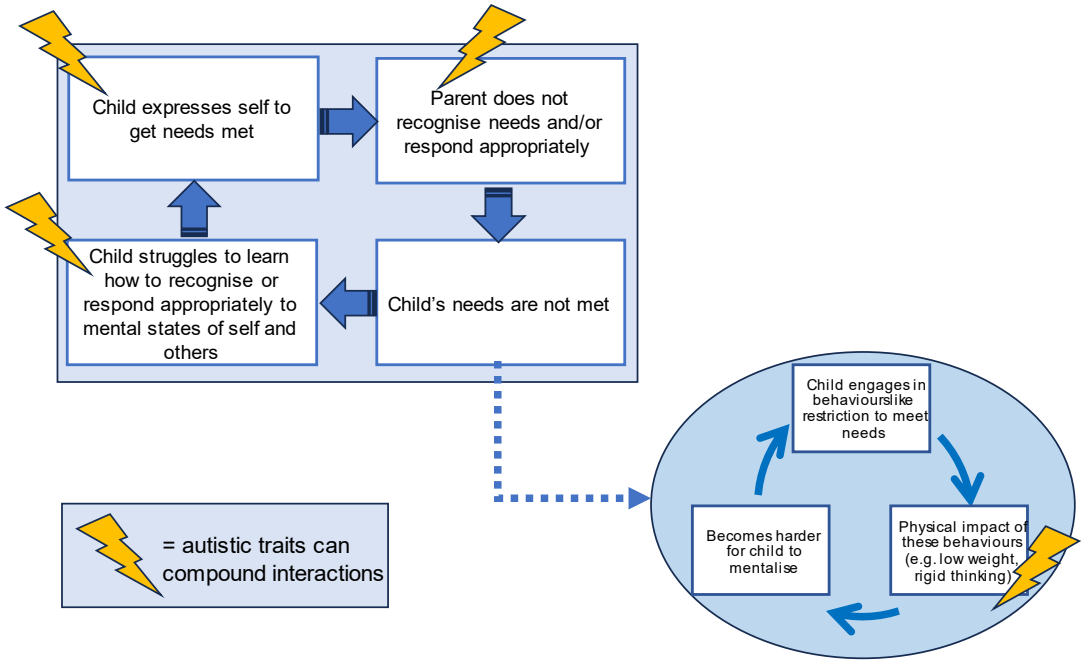

Figure 1.2. Suggested framework for the development of poor mentalisation, its relationship with disordered eating behaviours and how autism can impact both the development of mentalisation and the maintenance of disordered eating behaviours.

Difficulties in good mentalisation often lead to attempts to fulfil needs or regulate emotions through behaviours that might not be healthy such as restrictive eating, bingeing, or purging. Such actions can result in physical consequences like low weight or entrenched patterns of thinking. These outcomes, in turn, create additional obstacles for the child in developing good mentalisation. Consequently, there is an increased likelihood of the child persisting in these behaviours or escalating them to more severe levels.

The presence of ASD significantly further complicates the developmental pathway of mentalisation at various stages. Children with autism often encounter challenges in expressing their needs in a manner understandable to others. Moreover, parents with autism might face difficulties in recognising these needs or providing appropriate responses, resulting in unmet needs for the child. Additionally, individuals with autism might struggle to identify or respond suitably to the mental states of themselves or their parents, further impacting their unmet needs. Finally, ASD can exacerbate the impacts of these challenges, such as fostering rigid thinking patterns and compounding sensory issues, intensifying the complexities associated with mentalisation development.

The overarching aim of this thesis then is to explore further the roles that mentalisation, including parental mentalisation, plays in the development of EDs and in their treatment outcomes. In order to do so, I conducted three studies: a cross-sectional survey-based school study; secondary data analysis on an existing dataset; and a prospective observational study of an NHS parent intervention.

By investigating the relationships between mentalisation and risk and protective factors associated with disordered eating in a non-clinical sample of school children, my study endeavours to answer questions about the role of mentalisation before the diagnosis of an ED. By investigating how change in mentalisation affects ED treatment outcome, my studies seek to shed further light on the usefulness of parental mentalisation as a therapeutic target.

The structure of the thesis is as follows:

Chapter 2 presents a cross-sectional survey study of London schoolchildren. The study tests the theory that mentalisation is related to disordered eating before the development of an ED, and that mentalisation will correlate positively with ED protective factors, and negatively with ED risk factors. An additional aim of the study was to assess what could be considered the normal range of scores on the Reflective Functioning Questionnaire for Youth (RFQ-Y) as this has not been assessed in non-clinical populations before.

Chapter 3 presents secondary data analysis on a dataset of 192 families who undertook family therapy across clinical sites in the United Kingdom (see Jewell et al., 2021 for more information on this dataset). I aimed to answer the question: "*does mentalisation change through family therapy and does this change impact clinical treatment outcomes after 9 months of treatment?*" A second question was whether any change was predicted by baseline child factors, including ED severity and level of autistic traits.

In Chapter 4, I present a very brief overview of a meta-analysis and systematic review that I supervised. The aim was to synthesise evidence for the effectiveness of group parenting interventions on improving parental mentalisation and how change can affect children's social outcomes.

Chapter 5 presents a prospective observational study of 38 parents enrolled in an NHS-run Parent Group in England. The study tests the theory that short, parent-focused interventions influence parent mentalisation in the early stages of a child's treatment for an ED, how this change can affect a child's clinical outcomes after 3 months, and whether any child or parent factors influence change in parent mentalisation.

Finally, Chapter 6 provides a discussion and synthesis of the overall body of research presented in this thesis.

The study chapters are presented as stand-alone research studies, which are in the process of being adapted into papers and submitted for publication.

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Chapter 2: Disordered Eating Behaviours and Reflective Functioning in School Children: the REFLECT Study

2.1 Introduction

2.1.1 The Importance of Mentalisation

Mentalisation, operationalised as reflective functioning (RF), is a cognitive skill, defined as "*the capacity to understand ourselves and others in terms of intentional mental states, such as feelings, desires, wishes, attitudes, and goals*" (Allen, Fonagy & Bateman, 2008). Mentalisation is often considered an umbrella term for concepts integral to social functioning and emotion regulation, including Theory of Mind, alexithymia, mindfulness, and empathy. One of the most significant benefits of having the ability to mentalise is that it is adaptable, allowing for flexibility in changing social environments, fostering collaboration and co-operation (Fonagy, 2015; Luyten et al., 2020). It is imperative to forming and belonging to social groups, by accurately recognising and appropriately responding to social cues from others (Baron-Cohen, 2000). Without the ability to mentalise, individuals may struggle to interpret others' behaviours, resulting in misunderstandings and difficulties in forming and maintaining social connections.

In recent years, researchers have begun to broaden their understanding of the factors that contribute to the development of reflective functioning beyond the primary attachment relationship. Studies have shown that the quality of an individual's relationships with friends and other family members can also have a significant impact on their mentalising ability (Luyten et al., 2020). Additionally, sociocultural factors such as socioeconomic status and cultural background can influence the development of mentalisation. For example, young children from lower socioeconomic status backgrounds were outperformed on Theory of Mind tests by children from middle class backgrounds (Ebert et al., 2017).

Childhood experiences in relationships are crucial to successful development of mentalisation, however adolescence is also a critical period for the development of this cognitive skill (Clarke, Meredith & Rose, 2020; Dumontheil, Apperly & Blakemore, 2010), due to the influence of hormones, changes in the structure and function of the brain, and social changes (Blakemore, 2008; Goddings et al., 2012; Stavropoulos et al., 2018). During this period, psychosocial functioning is particularly important for the development of affect regulation, resilience against

aversive experiences, and forming appropriate relationships, both romantic and platonic (Beck et al., 2017; Ensink et al., 2017; Fonagy, Gergely & Jurist, 2018). A deficit in mentalisation during adolescence can impair the development of these abilities and increase the risk of mental health problems in later life (Bateman & Fonagy, 2019; Bateman & Fonagy, 2013). For example, difficulties with mentalisation may lead to problems with forming and maintaining relationships, as well as coping with stress and emotional regulation. This is particularly relevant given that adolescence is a time of increased vulnerability to mental health difficulties, including depression and anxiety (Sawyer et al., 2012), and that early intervention in the form of mentalisation-based therapies may be particularly effective during this developmental stage. Therefore, it is crucial to promote the development of mentalisation skills during adolescence to support healthy psychosocial functioning and reduce the risk of mental health problems later in life.

2.1.2 Eating Disorders

Eating disorders (ED) are serious mental illnesses characterised by disturbances in eating behaviours, distorted body image, and a preoccupation with weight and shape. It is estimated that around 10% of the population will experience an eating disorder in their lifetime (Keski-Rahkonen & Mustelin, 2016; Keski-Rahkonen, 2021; Ornstein et al., 2013; Petkova et al., 2019; Smink, van Hoeken & Hoek, 2012). Onset typically occurs in early adolescence although eating disorders affect individuals of all ages, genders and ethnicities (National Institute for Health and Care Excellence, 2020). Poor psychosocial functioning, repeated hospital admission, older age at first admission, and longer duration of illness are associated with an increased risk of early death (Franko et al., 2013; Papadopoulos et al., 2009). These findings suggest that interventions should focus on identifying the problem early, taking a systemic approach to treatment, and focusing on psychosocial functioning, not just physical health (Franko et al., 2013; Nicholls & Yi, 2012; Papadopoulos et al., 2009; Smink, van Hoeken & Hoek, 2012).

Numerous behaviours are associated with a disordered relationship with food and weight, these include, but are not limited to: excessive exercise; vomiting after meals; overuse of laxatives; avoidance of certain types of food; dieting; bingeing; rigid routines around meal times; and obsessively checking for physical changes in the body (Kärkkäinen et al., 2018). These behaviours are prevalent among individuals diagnosed with eating disorders as well as those with other mental health disorders, such as borderline personality disorder and obsessive-compulsive disorder (Al-Salom & Boylan, 2019; Aspen et al., 2014; Touchette et al., 2011). However, these behaviours are also observed in the non-clinical population, and studies have consistently reported high levels of disordered eating behaviours and cognitions

amongst adolescents over the past four decades (Abraham et al., 1983; Fear, Bulik & Sullivan, 1996; Jones et al., 2001; Pursey et al., 2020; Wu et al., 2019). By the age of 16 years old, 41% of girls reported regularly fasting, purging or binge-eating; 11% of girls could meet the criteria for a DSM-V eating disorder (Bould et al., 2018). Amongst adolescent boys, 45% reported disordered eating behaviours, including skipping meals and over-exercising (Wilksch et al., 2020). Nevertheless, lifetime prevalence estimates of EDs range from 1% to 4%, indicating that not all individuals who engage in disordered eating behaviours develop a clinically diagnosable ED (Bagaric et al., 2020; Keski-Rahkonen & Mustelin, 2016; Keski-Rahkonen, 2021; Swanson et al., 2011; Udo & Grilo, 2018).

To be able to identify people most at risk of developing an ED, it is important to fully understand the factors that protect against development, and the factors that increase the risk of their development. Risk factors may include a variety of individual, familial and societal factors including low self-esteem; being a perfectionist; negative body image; family dysfunction; and societal pressure to conform to unrealistic beauty ideals (Barakat et al., 2023; D'Anna et al., 2022; Jackson & Chen, 2014; Keski-Rahkonen & Mustelin, 2016; Kim et al., 2018; McKnight Investigators, 2003). Biological factors such as genetics and neurobiology play a role, as well as traumatic life events and comorbid psychiatric disorders (Le et al., 2017; Levine & Sadeh-Sharvit, 2023; Solmi et al., 2020; Watson et al., 2019). Protective factors include individual factors like self-esteem, self-compassion and a positive body image, as well as social factors such as healthy peer relationships (Croll et al., 2002; Gustafsson et al., 2009; Hazzard et al., 2022; Linardon, 2021). Additionally, cognitive and emotional factors, including effective emotion regulation, may help to protect against the development of eating disorders (Osborne et al., 2023; Rothschild-Yakar et al., 2018). Understanding the influence of risk and protective factors is essential for the development of effective prevention strategies. Prevention may focus on promoting protective factors and reducing risk factors in those at high risk for developing an ED. Equally, early intervention may be effective in preventing the progression of symptoms to a full-blown ED if we can fully understand the factors influencing ED development. By targeting these factors, it may be possible to reduce the incidence of eating disorders and promote positive mental health outcomes.

2.1.3 Eating Disorders and Mentalisation

One potential, modifiable risk factor for ED that has been little explored at population level is mentalisation. Clinicians often report that individuals with eating disorders exhibit deficits in mentalisation. Young people with Anorexia Nervosa (AN) may believe that healthcare professionals and their parents are attempting to make them eat for insidious reasons, rather than because they are trying to save the young person's life, indicating a deficit in understanding the intentions of others. Furthermore, individuals with Bing Eating Disorder

(BED) may have limited insight into how their mental states contribute to their behaviours. However, research on the relationship between mentalisation and eating disorders is still relatively limited, particularly with regards to young people and specific behaviours; most studies focus on adult in-patients with severe symptoms and specific diagnoses (Jewell et al., 2016). Given that many disordered eating behaviours and cognitions are transdiagnostic (Brockmeyer et al., 2012; Brockmeyer et al., 2012; Fairburn, Cooper & Shafran, 2003; Keel et al., 2011) and are present in non-clinical populations (Bould et al., 2018; Wilksch et al., 2020), it may be more useful to examine how mentalisation relates to specific behaviours rather than diagnoses. It may also be important to understand how specific aspects of mentalisation are related to disordered eating behaviours. Previous research has shown a relationship between mindfulness, one aspect of mentalisation, and body dissatisfaction: individuals with better ability to reflect on the present moment non-judgementally are more accepting of their body and are less likely to engage in comparisons with others or negative self-talk (Sala et al., 2020). Conversely, alexithymia is associated with disordered eating (Rothschild-Yakar et al., 2018) and elevated levels of alexithymia can lead to a disconnection with the bodily sensations associated with emotions; struggling to connect with your body and emotional experiences can contribute to body dissatisfaction (Keating, Tasca & Hill, 2013; Nowakowski, McFarlane & Cassin, 2013).

According to a recent review, adolescents with AN show more difficulty in recognising emotions in themselves and others and exhibit reduced mentalising abilities compared to those without eating disorders (Jewell et al., 2016). Mentalisation appears to have a relationship with both illness severity and therapeutic engagement (and presumably response to therapy) amongst individuals with eating disorders. Poor mentalisation ability is related to worse treatment outcomes for adolescents with AN (Schulte-Rüther et al., 2012), particularly a rigid, certain approach to understanding one's own emotions (Jewell et al., 2021).

There is very little research into mentalisation and other eating disorders, like BED or Bulimia Nervosa (BN), in adolescent samples. However, both disorders have been linked to difficulties in the ability to mentalise (Tasca, 2019). A decreased ability to mentalise was found in adults with BED, which may lead to a disruption in communication, increased interpersonal problems, and more negative affect (Tasca, 2019). This is supported by previous research that found higher levels of interpersonal problems related to more negative affect and more reported binge-eating symptoms (Ivanova et al., 2015). In the case of BN, the picture is mixed. Some research suggests that mentalising ability may not be significantly different between individuals with BN and those in a community sample (Bora & Köse, 2016; Jewell et al., 2016). However, among patients with BN, mentalisation scores tended to be more polarised, with more very high and very low scores compared to the community sample (Jewell et al., 2016;

Tasca, 2019). Another study suggested that BN patients demonstrated worse overall empathy scores than AN patients or healthy controls, but no significant impairment in theory of mind (Konstantakopoulos et al., 2020). This highlights the need for a more nuanced approach to understanding the relationship between disordered eating behaviours and mentalisation, beyond just diagnostic categories.

2.1.4 Factors Associated with Disordered Eating and Mentalisation

There is evidence to suggest that strong mentalisation ability may be a protective factor against the development of eating disorders, and as such, it is important to examine the different ways in which mentalisation and eating disorders interact. This includes investigating the relationships between mentalisation and other factors that may be associated with disordered eating, such as self-esteem, self-compassion and other potential protective or risk factors.

Mentalisation and self-esteem are closely related psychological constructs, with multiple studies suggesting that healthy self-esteem correlates with good mentalising abilities (Antonsen et al., 2016; Ballespí et al., 2021). Self-esteem is the subjective evaluation that each person has of themselves, reflecting one's confidence and satisfaction with themselves as a person (Orth & Robins, 2014). It has been suggested that individuals who can accurately perceive their own mental states and those of others will be more likely to have a positive and realistic sense of self, which in turn is related to higher levels of self-esteem (Müller, Wendt & Zimmermann, 2023). Conversely, those with low self-esteem may hold negative views of themselves, making it difficult to accurately recognise and process emotions and experiences. Self-esteem has also been suggested as a protective factor against the development and maintenance of eating disorders: individuals with high levels of self-esteem are more likely to have a positive body image, be satisfied with their appearance and be less likely to engage in unhelpful behaviours (Barakat et al., 2023; Hazzard et al., 2022; Nicholls, et al., 2016; Nicholls & Viner, 2009; Orth & Robins, 2014; Petisco-Rodríguez et al., 2020). Those with high self-esteem are also less likely to compare themselves to other people or be influenced by beauty standards, and less likely to engage in purging and compulsive eating (Barakat et al., 2023; Hazzard et al., 2022; Nicholls et al., 2016; Nicholls & Viner, 2009; Orth & Robins, 2014; Petisco-Rodríguez et al., 2020).

Self-compassion is the practice of treating oneself with kindness, non-judgement, and understanding, particularly in times of distress and difficulty (Gilbert, 2023; Kelly, Vimalakanthan & Carter, 2014). Research has suggested that by cultivating self-compassion, individuals can learn to be kinder towards themselves, and break the cycle of self-blame and negative emotions that may contribute to disordered eating (Linardon, 2021; Pullmer, Coelho

& Zaitsoff, 2019; Turk & Waller, 2020). Interventions targeting self-compassion can improve body satisfaction and enhance overall wellbeing (Levine & Smolak, 2016; Linardon, 2021). Additionally, some have suggested that self-compassion is closely related to mentalisation (Gilbert, 2023); cultivating these skills may be beneficial in promoting resilience, emotion regulation and good mental health (Meyer & Leppma, 2019; Talwar, Castellanos & Bosacki, 2022).

There is evidence to suggest that family functioning is associated with both mentalisation and disordered eating. Research has shown that individuals with disordered eating often report dysfunctional family environments characterised by low cohesion, poor communication, and high conflict (Holtom-Viesel & Allan, 2014). Conversely, healthy family functioning has been linked to better mentalisation abilities, including increased empathy and emotion regulation (Gambin, Malgorzata, Gambin & Sharp, 2015; Gambin, Małgorzata et al., 2021). Therefore, it may be important to consider family functioning as both a potential risk factor for disordered eating and a protective factor for mentalisation.

Research has shown that perfectionism is strongly associated with eating disorders, particularly in relation to restrictive eating behaviours (Bardone-Cone et al., 2007; Dahlenburg, Gleaves & Hutchinson, 2019; Petisco-Rodríguez et al., 2020; Stice, 2002), with those who score high on measures of perfectionism being more likely to develop disordered eating patterns (Bardone-Cone et al., 2007; Dahlenburg, Gleaves & Hutchinson, 2019; Petisco-Rodríguez et al., 2020; Stice, 2002). On the other hand, mentalisation has been shown to be inversely related to perfectionism, with higher levels of mentalisation being associated with lower levels of perfectionism (Dieleman et al., 2020). This suggests that mentalisation may act as a protective factor against the development of perfectionistic tendencies, which in turn may reduce the risk of developing eating disorders.

Research suggests that quality of peer relationships is associated with both disordered eating and mentalisation. Poor peer relationships, such as social isolation, exclusion, and bullying, have been linked to increased risk of disordered eating; while positive peer relationships and social support may act as protective factors against disordered eating (Barbeau, Carbonneau & Pelletier, 2022; D'Anna et al., 2022; Donnelly, Chan & Nicholls, 2023). Similarly, mentalisation has been found to be associated with peer relationships, with higher levels of mentalisation being related to more positive social interactions and fewer difficulties in social relationships (Bateman & Fonagy, 2019; Fonagy & Allison, 2014; Fonagy, Gergely & Jurist, 2018; Luyten et al., 2020). Specifically, individuals with stronger mentalising abilities may be better able to understand others' perspectives and emotions, leading to more effective communication and closer, more supportive relationships with peers (Bateman & Fonagy, 2019; Fonagy & Allison, 2014; Fonagy, Gergely & Jurist, 2018; Luyten et al., 2020).

2.1.5 The Current Study

Risk factor research suggests that there are a number of modifiable factors in addition to genetic and biological vulnerability associated with the development of an eating disorder, including perfectionism, poor peer relationships and body dissatisfaction (Keski-Rahkonen & Mustelin, 2016; Kim et al., 2018). Factors that may protect individuals from developing EDs include high levels of self-compassion and self-esteem, and strong family relationships (Langdon-Daly & Serpell, 2017; Levine & Smolak, 2016). Research on EDs and mentalisation has mostly focused on adults, inpatient populations and those with a diagnosis of AN (Jewell et al., 2016), making it difficult to draw conclusions on the protective nature of mentalisation. One study of mentalisation in a school community noted that high levels of mentalisation were associated with lower levels of externalising behaviours, such as psychopathy (Cropp, Alexandrowicz & Taubner, 2019). The authors concluded that the ability to understand and interpret other people's internal states may act as a protective factor against developing mental health problems. Another study recently investigated the relationship between failures in mentalisation, dissociative experiences (i.e. experiencing a state of detachment from reality) and eating disorders in school-aged adolescents (Quattropani et al., 2022). The results showed that, in a non-clinical sample, uncertainty about mental states (of oneself or of others) and high levels of dissociative experiences are both predictors of an increased risk of developing an eating disorder. Both of these studies suggest that, for adolescents in the community, poor mentalising ability is associated with more behavioural and emotional problems. However, neither study looked at the different aspects of mentalisation, how mentalisation correlates with a variety of risk and protective factors associated with eating disorders or the relationship between mentalisation and individual disordered eating behaviours. Therefore, this current study aims to answer the question: *What is the relationship between mentalisation and disordered eating behaviours in adolescents in a non-clinical community population, and what is the relationship between mentalisation and known risk/protective factors for eating disorders?*

2.2 Aims and Hypotheses

My primary aim was to examine the relationship between mentalisation and disordered eating behaviours in a sample of adolescents without an eating disorder diagnosis. I also aimed to determine whether there was an association between reflective functioning and factors that have previously been recognised as protective against the development of an eating disorder, namely self-compassion, self-esteem, mindfulness and peer relationships. Finally, I aimed to determine whether there was a relationship between reflective functioning and factors that may put a child at risk of developing an eating disorder, including perfectionism, emotion

dysregulation, poor family functioning, and internalisation of societal norms of how bodies should look.

My main hypotheses were:

1. There will be a negative relationship between reflective functioning and level of disordered eating behaviours.

2. There will be a positive relationship between reflective functioning and recognised eating disorder protective factors, including self-esteem, self-compassion, mindfulness and good peer relationships.

3. There will be a negative relationship between reflective functioning and recognised eating disorder risk factors, including emotion dysregulation, perfectionism, family dysfunction and internalisation of the thin ideal.

2.3 Methodology

2.3.1 Design

The study was a cross-sectional population study of adolescents in the United Kingdom. The study used a non-randomised, naturalistic, self-report survey design.

2.3.2 Population

I recruited students between 11 and 16 years old from state secondary schools in the South East of England. This age group represents the stages of adolescence when most eating disorders are diagnosed, and an important stage in the development of mentalisation (National Institute for Health and Care Excellence, 2020).

To assess for socioeconomic status of each school, I used data from the Department of Education that reports the percentage of pupils eligible for pupil premium grant. The pupil premium grant is designated to improve educational outcomes for disadvantaged pupils in state-funded schools in England, including those currently or previously eligible for free school meals, children in local authority care and those previously in state care (Department of Education, 2023). The average percentage of pupils eligible for pupil premium in secondary schools is 24.3% in England and 26.3% in London. For the average percentage of each school in the study, see Table 2.2.

Students were invited to take part if they had adequate English to provide informed consent and understand the study material and were currently studying at participating schools in years

7 to 11. Students were excluded from the study if they did not have their parent's consent, if they had a diagnosis of an eating disorder and were receiving treatment, or if they were identified by teaching staff as unable to take part (for example, if they had a significant learning difficulty that meant they would be unable to complete the questionnaires or would be overly distressed by the questions asked).

2.3.3 Materials

2.3.3.1 Primary Outcome Measures

Reflective Functioning Questionnaire – Youth (RFQY-5) (Sharp et al., 2022)

Mentalisation was measured using the shortened version of the Reflective Functioning Questionnaire for Youth (RFQY-5) (Ha et al., 2013; Sharp et al., 2009). This is a 5-item self-report, where students assess statements on a 6-point Likert scale from strongly disagree to strongly agree. An example question is "*I'm often curious about the meaning behind others' actions*". Higher scores represent greater ability for mentalisation Sharp et al (2022) correlated scores from the short version of the RFQ-Y with scores from other measures related to mentalisation, including the Child Eyes Test (Baron Cohen et al., 2001), suggesting good construct validity in a clinical sample (r_s = .332) as well as good internal consistency (Cronbach's α = .75; Sharp et al., 2022).

Eating Disorders Examination – Questionnaire Short (EDE-QS) (Gideon et al., 2016)

ED severity was measured using the short version of the Eating Disorder Examination Questionnaire (EDE-QS) (Fairburn & Beglin, 2008). This 12-item self-report measure assesses ED pathology through asking about severity of symptoms over the last 7 days, on a 4-point response scale (0 days to 6-7 days) (Gideon et al., 2016). Questions include, "*Have you been deliberately trying to limit the amount of food you eat to influence your weight or shape (whether or not you have succeeded)?"* Higher scores indicate more problematic eating behaviours; a score of 15 or more suggests a potential ED (Prnjak et al., 2020). It is used routinely in health services and research, and demonstrates good internal consistency in clinical and non-clinical groups (Cronbach's α = .84 to .96), and good convergent validity when compared to weight dissatisfaction scales (Pearson's r = .683) (Berg et al., 2012; Duffy et al., 2021)

2.3.3.2 Protective Factors

The Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965)

Self-esteem was measured using the Rosenberg Self-Esteem Scale (Rosenberg, 1965), which measures global self-worth by measuring positive and negative feelings about oneself. It is a 10-item Likert scale, where young people mark how much they agree with the statement

on a 4-point scale of Strongly Agree to Strongly Disagree. The scale has been validated for use with young people (Bagley & Mallick, 2001), and it is the most widely used measure of self-esteem in psychological research (Sinclair et al., 2010). Questions include, "*I feel that I'm a person of worth, at least on an equal plane with others".*

Self-Compassion Scale – Youth (SCS-Y) (Neff et al., 2021)

Self-compassion was measured using the Self-Compassion Scale for Youth (Neff et al., 2021). This is a 17-item Likert self-report, where young people mark how much they agree with a statement on a 5-point scale of Almost Never to Almost Always. Questions are grouped into sub-scales of Self-Kindness, Self-Judgement, Common Humanity, Isolation, Mindfulness and Over-identification. An example question is, "*When I feel I'm not "good enough" in some way, I try to remind myself that other people sometimes feel this way too".* Higher scores on Self-Judgement, Isolation and Over-identification suggest less self-compassion, while high scores on Self-Kindness, Common Humanity and Mindfulness suggest high self-compassion. There is also a total self-compassion score, calculated from subscales, with scores over 3.5 suggesting high self-compassion (Cronbach's α = .820 to .851). Construct validity has been established in young people, with total SCS-Y scores associated with happiness (r = .60), resilience (r = .65) and depression (r = -.53) (Neff et al., 2021).

Child and Adolescent Mindfulness Measure (CAMM) (Greco, Baer & Smith, 2011)

Being able to observe the present moment, behave with awareness of your actions and be non-judgemental towards yourself and your inner experiences are skills associated with mindfulness. To assess mindfulness, students completed the Child and Adolescent Mindfulness Measure (CAMM) (Greco, Baer & Smith, 2011). This 10-item Likert self-report measure asks young people to indicate how often each sentence is true for them on a 5-point scale of Never True to Always True. For example, "*I keep myself busy so I don't notice my thoughts or feelings".* In the current analysis, scores have been re-coded so that higher scores indicate higher levels of mindfulness. Studies have demonstrated that the CAMM is a valid and reliable measure in non-clinical adolescent populations (Cronbach's α = 0.84; convergent validity measured through correlation with Total Difficulties Score of the Strengths and Difficulties Questionnaire Self-Report, r = -.52) (Kuby, McLean & Allen, 2015).

PROMIS Pediatric Peer Relationships Scale (Short Form) (PROMIS-PPRS) (DeWalt et al., 2013)

The Patient-Reported Outcomes Measurement Information System (PROMIS) is a bank of patient-reported outcomes for evaluating or monitoring physical, mental and social health (Cella et al., 2007). The Pediatric Peer Relationships Scale measures a young person's

perception of the quality of their peer relationships (DeWalt et al., 2013). It is an 8-item Likert self-report measure, with young people responding to statements about how they have felt over the past 7 days, using a 5-point scale of Never to Almost Always. Higher total scores suggest better peer relationships. The scale has been validated in multiple populations of children (Luijten et al., 2021).

2.3.3.3 Risk Factors

Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004)

The Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004) is a 36-item self-report measure assessing problems with emotion regulation, with high internal consistency (Cronbach's α = .82-.95) and predictive validity (Hallion et al., 2018), and test–retest reliability across 4 to 8 weeks ($p < .01$; Gratz & Roemer, 2004). Each item is scored on a 5-point Likert scale, from Almost Never to Almost Always. For example, "*I care about what I am feeling"*. The DERS has six subscales: Nonacceptance of emotional responses, Difficulty engaging in goal-directed behaviour, Impulse control difficulties, Lack of emotional awareness, Limited access to emotion regulation strategies and Lack of emotional clarity. Higher scores on any of the scales suggest more emotion regulation problems. The DERS has been used extensively in research, with subscales showing good reliability in adolescent populations (Cronbach's α = .72-.87 (Neumann et al., 2010).

A subscale of particular interest for this study was the Lack of Emotional Clarity subscale, which measures an aspect of mentalisation – alexithymia. The Lack of Emotional Clarity subscale measures how much an individual is clear about the emotions they experience, with high scores indicating lack of understanding about emotions (Gratz & Roemer, 2004).

*McMaster Family Assessment Device (General Functioning Scale) (GFFAD) (*Byles et al., 1988; Epstein, Baldwin & Bishop, 1983)

To measure overall family functioning, young people completed the General Functioning Scale, a subscale of the McMaster Family Assessment Device (Byles et al., 1988; Epstein, Baldwin & Bishop, 1983). This is a 12-item self-report measure, with participants recording how much they agree with a statement on a 4-point Likert scale from Strongly Agree to Strongly Disagree. For example, "*Planning family activities is difficult because we misunderstand each other"*. Higher scores indicate more problematic overall family functioning. This subscale has been validated as a separate scale of overall functioning and can be used with different adolescent populations (Kazarian, 2010; Pedersen et al., 2019; Shek, 2001).

*Child-Adolescent Perfectionism Scale (CAPS) (*Flett et al., 2016)

Perfectionism was measured using the Child-Adolescent Perfectionism Scale (CAPS) (Flett et al., 2016). This is a 22-item self-report measure, where each statement is rated on a 5-point Likert scale, from False – Not At All to Very True of Me. There are two subscales: Self-Oriented Perfectionism (i.e. high personal standards: "*I try to be perfect in everything I do*") and Socially Prescribed Perfectionism (i.e. beliefs about what level of perfectionism others expect of you: "*My parents don't always expect me to be perfect in everything I do*"). Higher scores on either subscale indicate higher levels of perfectionism. The CAPS is the most used instrument for measuring perfectionism in young people, with consistently good internal consistency demonstrated (Vicent et al., 2019).

Sociocultural Internalization of Appearance Questionnaire - Adolescents (SIAQ-A) (Keery et al., 2004)

Internalisation of the thin ideal was measured using the Sociocultural Internalization of Appearance Questionnaire - Adolescents (SIAQ-A) (Keery et al., 2004). This measure was developed for adolescents and aims to establish how media representation can influence the participant's perception of their body. It is a 5-item self-report tool, with statements rated on a 5-point Likert scale, from Definitely Disagree to Definitely Agree. An example question: "*I would like my body to look like the bodies of people in the movies*". Higher scores indicate greater internalisation of appearance ideals. Internal consistency has been confirmed in cross-cultural adolescent samples (Cronbach's α = .83-.92; Keery et al. 2004). Convergent validity has been established by measuring the degree of correspondence between appearance ideal internalisation and body dissatisfaction and between internalisation and bulimic behaviours (*r* = 0.40–0.60) (Keery et al., 2004; Meier & Gray, 2014; Tiggemann & Miller, 2010).

In addition, data was collected on individual demographics including age, gender and ethnicity.

2.3.4 Patient and Public Involvement

An online PPI session was conducted with secondary school teachers (N=10) in March 2020. The research question and aims were outlined, and the group members were invited to comment on the study aims and design. All participants reported that they felt the research question was important and needed to be explored, with many citing experience of disordered eating behaviours and problems with social communication in their pupils. Teachers reported that questionnaire sessions needed to be no longer than 20 minutes, as they felt that young people would lose interest after this time. Some raised concerns that it sounded like a lot of work for the teachers, and that there needed to be an incentive for the senior management teams. Additionally, many commented that it was often difficult to get consent from parents, and seemed enthusiastic about the idea of an opt-out consent procedure.

To address some of the concerns raised by the group, I piloted the questionnaires on several people of different ages, determining that they took no more than 20 minutes. I offered each school several incentives to take part, including teacher and parent training on eating disorders, a lesson on body image and eating disorders for the classes that completed the questionnaires and, for the schools that signed up through the North West London Schools Research Network, each school was given £1000 after taking part. I also implemented an opt-out parental consent procedure (see Ethical Approval – Consent section).

After data collection was complete and preliminary analysis had been conducted, a group of young people working with Listen to Act, a Public and Patient Involvement (PPI) charity, were invited to review the findings and guide interpretation of the data. The findings were also discussed over email and telephone with several young people with lived experience of mental health problems. Suggestions from these activities are included in the discussion section and incorporated into the analysis.

2.3.5 Procedure

State secondary schools in England were invited to take part. The study was advertised through the North West London Schools Research Network website and newsletter, with teaching staff asked to complete an expression of interest form. The teaching staff were then contacted by one of the Schools Research Network team. If they continued to express interest in taking part in the study, the schools were sent a resources pack with a copy of the Survey, Information Sheet for Parents, “Opt-out” Consent Letter for Parents, copy of REC approval letter, and the most up-to-date Protocol. I liaised with a specific member of teaching staff in each school about the logistics of conducting the survey within their institution, and to arrange both the training session for teachers and parents, and the data collection session.

Parents were contacted at least two weeks before data collection began, using the communication system of the school (mostly email). Parents were asked to complete and return the consent form if they did not want their child to take part (see Ethical Approval – Consent section).

For the short teaching session, I conducted the session in person or over Zoom, at least two weeks before data collection began. The session was designed by my research group at Imperial College London, with support from teacher PPI groups. The content of the session was in line with what is advised by the Department for Education, alongside research on evidence-based ED prevention programmes (including the Body Project, Healthy Weight and Project Health programmes) (Dakanalis, Clerici & Stice, 2019; Long, 2019; Musby, 2023; PSHE Association, 2021; Stice et al., 2017).

Students were asked to complete the questionnaires during the time period that had been set aside for the task (normally a PSHE class of 30-40 minutes long). Qualtrics links were distributed via email to all students. Students were presented with a participant information sheet and an assent form. Once assent was obtained, the student was directed to the Qualtrics survey. The survey took between 5 and 30 minutes for students to complete. On completion of the whole survey, students were presented with a debrief sheet that explained the aim of the study and signposted where to access support if needed. All participants were also provided with a resource sheet on coping with mental health problems, and where to access support, particularly focusing on EDs, at the beginning of the session. If a student had indicated that they may have an eating disorder, they were presented with a different end of survey message that asked them to inform their teacher of this. They were then invited by their teacher to attend an informal debrief session with the research team to discuss their feelings and signpost them to ED support services (no student took up the option of this debrief session).

2.3.6 Statistics and Data Analysis

2.3.6.1. Sample Size

Using the sample size guidelines designed for correlational analysis (Bujang & Baharum, 2016), a minimum sample size of N = 782 was used. To allow for any incomplete questionnaires, I aimed to recruit 900 participants. This sample size allows for the results to be able to reach a minimum correlation coefficient of $r=0.1$ at $p<0.05$ and Type II error rate of $\beta=0.2$ (80% power).

2.3.6.2 Statistical Analysis

To analyse the data a hierarchy of statistical tests was used. Basic descriptive statistics were used to describe the prevalence of disordered eating behaviours and of reflective functioning, as well as the characteristics of the participants. Bivariate tests including Pearson's correlations and t-tests were used to assess the associations between disordered eating behaviours and reflective functioning, and potential risk and protective factors, including individual, family and social factors. Finally, multivariate statistics, including Analysis of Variance (ANOVA) and multiple linear regression, were used to further assess relationships between reflective functioning, disordered eating behaviours and other psychosocial factors. Cronbach's α was conducted for each of the measures and their subscales to assess for internal consistency in this sample (see Table 2.1). Internal consistency was very good for all the scales, with all achieving Cronbach's α above .7.

ED encompass not only abnormal eating behaviours but also dysfunctional thought patterns surrounding food, weight, and body image (American Psychiatric Association, 2013). The EDE-QS gives an overview of both cognitions and behaviours associated with ED. To further explore the relationship between mentalisation and disordered eating, I split the EDE-QS into two new variables: ED Behaviours (created from questions on restricting, purging, compulsive exercise and binge-eating) and ED Cognitions (created from questions on desire to lose weight, fear of weight gain, body dissatisfaction and preoccupation with food, weight and shape). Cronbach's' alpha was calculated for both variables and demonstrated good reliability (ED Behaviours: α = .792, 5 items; ED Cognitions: α = .893, 7 items). Using the individual questions on the EDE-QS, I created continuous variables to further explore the relationship between mentalisation, and thoughts and behaviours associated with ED. These included Restricting Food (mean of questions 1 and 2), Preoccupation with Food, Weight or Shape (mean of questions 3 and 4), Fear of Weight Gain (question 5), Desire for Weight Loss (question 6), Purging (question 7), Compulsive Exercise (question 8), Binge Eating (question 9 and 10), and Body Dissatisfaction (question 11 and 12). There was good Cronbach's alpha for Restricting Food (α = .679), Preoccupation with Food, Weight and Shape (α = .784), Binge Eating (α = .783) and Body Dissatisfaction (α = .834). These variables had a range of 0 to 3. Descriptive statistics for these variables are displayed in Table 2.4.

When conducting multiple correlations, it is important to remember that p-values, used to determine statistical significance, are affected by multiple comparisons. The probability of obtaining a significant result by chance alone increases with every comparison made, and therefore, the threshold for statistical significance must be adjusted to control for this increased probability of Type I error (Field, 2013). One common method of controlling for multiple comparisons is the Bonferroni correction, which adjusts the significance threshold by dividing it by the number of comparisons being made (Field, 2013). However, Bonferroni correction can be overly conservative, reducing statistical power unnecessarily, and it is important to consider the possibility of Type II errors, where a true effect is not detected due to inadequate sample size or measurement error (Nakagawa, 2004). As an alternative, some researchers recommend representing Pearson's correlation coefficients as effect sizes, to provide a more meaningful interpretation of the results (Gignac & Szodorai, 2016). Effect sizes themselves are not affected by multiple comparisons. Effect size measures, such as Pearson's correlation coefficient or Cohen's D, represent the magnitude of a relationship or difference between two variables, and this magnitude does not change as a result of multiple comparisons (Fritz, Morris & Richler, 2012; Gignac & Szodorai, 2016). This approach may be particularly appropriate when the sample size is large, as it is with the sample of 941 students used in this study. According to Cohen (Cohen, 2013), correlations of 0.1, 0.3, and 0.5 can be considered

small, moderate, and large effect sizes, respectively. For example, consider the correlation coefficient between mentalisation and age of r = .080 (p < .001) (Table 2.3). While this correlation is statistically significant, it represents a very small effect size (Cohen, 2013) and may not be meaningful in practice. In this case, using a Bonferroni correction would likely be too conservative and unnecessarily reduce statistical power. Reporting the correlation coefficient as an effect size, rather than as p-values and Bonferroni corrections, provides a more nuanced interpretation of the findings.

2.3.7 Ethical Approval

Ethical approval was obtained from the Head of Department and Imperial College Research Ethics Committee (ICREC). Few ethical issues were identified, as the majority of questionnaires are regularly administered to children during research. However, there were some concerns about the use of the EDE-QS as this questionnaire asks about frequency of eating disorder behaviours; some of the ethics committee expressed concern that this questionnaire may cause distress to participants if they had never been exposed to information about eating disorders. To address these concerns, I delivered an information session to each class that took part, discussing where to get support for any concerns about eating disorders. I also provided schools with information sheets to give to students, which included a list of organisations that provide support for mental health. Additionally, students who scored highly on the EDE-QS were automatically sent a note through Qualtrics that they needed to speak to their teacher, and they were invited to contact the research team and attend a debrief if they felt distressed. Anonymity was achieved through the use of Qualtrics – students were sent the link by their teacher and were not asked to put any identifying information into the forms, so it was not possible to identify those who took part.

2.3.7.1 Consent

I used an “opt-out” procedure to obtaining parental consent. Parental opt-out consent procedures in schools operate under the premise that, since teachers and the school have already granted consent for students to participate, explicit permission from parents is not required (Farmer & Porcellato, 2016; Tigges, 2003). However, parents who strongly oppose their child's involvement can still communicate their concerns to the researchers or relevant parties, indicating that their children should not be included. The main rationale was that, currently, eating disorder guidance lacks validity with respect to males, ethnic minorities, and those who are neurodiverse, because of a paucity of data (Beccia et al., 2019; Nagata, Ganson & Murray, 2020). One aim of the study was to gather data on disordered eating behaviours from participants that represent the school-age population. However, multiple research studies have shown that using active “opt-in” parental consent leads to sample bias (Shaw et al., 2015) and results in under-representation of marginalised groups; this is

particularly the case for sensitive information like weight (Strugnell et al., 2018). Specifically, a meta-analysis suggests that “opt-in” parental consent can result in reduced responses from boys, older participants and people of colour (Liu et al., 2017). Other studies suggest that children of one parent families and those who are academically underperforming are also underrepresented in research with “opt-in” consent procedures, compared to those with “opt-out” consent procedures (Shaw et al., 2015). It was hoped that using an “opt-out” procedure would result in high levels of student participation, so that results can provide generalisable findings on prevalence to guide future prevention and intervention. In addition, “opt-out” parental consent procedures are seen favourably by many students and parents (Cardillo et al., 2018; Fernandes, Roland & Morris, 2017). The “opt-out” procedure is common in schools across the UK and has been used successfully in other, similar studies (Mateu et al., 2020). An “opt-out” procedure was deemed by staff that I consulted to be less time-consuming and therefore less burdensome than an active “opt-in” consent procedure.

Table 2.1 Cronbach's alphas for baseline variables.

Scale	N	Items	Cronbach's α
EDE-QS	890	12	.915
DERS Non-Acceptance of Emotional Responses	883	6	.905
DERS Difficulty Engaging in Goal- Directed Behaviour	887	5	.819
DERS Impulse Control Difficulties	870	6	.860
DERS Lack of Emotional Awareness	885	6	.810
DERS Limited Access to Emotion Regulation Strategies	875	8	.891
DERS Lack of Emotional Clarity	907	5	.774
DERS Total	752	36	.942
RFQY-5	923	5	.837
CAPS Self-oriented Perfectionism	879	12	.840
CAPS Socially Prescribed Perfectionism	892	10	.881
CAMM	890	10	.869
SCS-Y Total	788	17	.750
RSES	759	10	.823
GFFAD	694	12	.846
SIAQ	752	5	.941
PROMIS-PPRS	715	8	.925

Note. Abbreviations in table: EDE-QS, Eating Disorder Examination Questionnaire; RFQY-5, Reflective Functioning Questionnaire for Youth; CAPS, Child-Adolescent Perfectionism Scale; DERS, Difficulties in Emotion Regulation Scale; CAMM, Child and Adolescent Mindfulness Measure; SCS-Y, Self-Compassion Scale for Youth; RSES, Rosenberg Self-Esteem Scale; GFFAD, General Functioning subscale of the McMaster Family Assessment Device; SIAQ, the Sociocultural Internalization of Appearance Questionnaire; PROMIS-PPRS, PROMIS Pediatric Peer Relationships Scale.

2.4 Results

2.4.1 Demographics

Recruitment occurred between May and December 2022 across three schools in London. 1155 students completed ethics forms, with 973 actively giving their assent or consent (if over 16) to take part. Of these, 32 participants were removed because they completed less than 60% of the survey. This cut-off point was chosen as completing at least 60% of the survey meant that the participant had completed the EDE-QS and/or the RFQY-5, which contained the primary variables of interest. 941 students were included for analysis. A full breakdown of the demographic make-up of the sample is shown in Table 2.2. Over 50% of the students identified as male and only 16% of the students described themselves as White. Most female students had not missed any periods recently, and of those who had, the majority had only missed one period.

2.4.2 Descriptive Statistics

Descriptive statistics for all outcome measures are displayed in Table 2.3. The results suggest that, on average, students report low levels of disordered eating behaviours (mean = 8.75, threshold for potential ED = 15), although the full range of scores was displayed in the sample (see Appendix 1). Female students showed higher rates of disordered eating behaviours compared to male students ($t(915) = 2.801$, $p < .005$, Cohen's $D = .187$).

Table 2.2 *Demographic characteristics of the sample*

		N	***%***	***% pupils eligible for pupil premium grant***
Sex				
	Female	400	42.5	
	Male	518	55.0	
	Other	23	2.4	
Ethnicity				
	White	159	17	
	Mixed Race	104	11	
	South Asian	225	24	
	Chinese	11	1	
	Other Asian	108	11	
	Black	178	19	
	Other Ethnicity	57	6	
	Arab	99	11	
Age (in years)				
	11	118	12.6	
	12	173	18.5	
	13	176	18.8	
	14	140	15.0	
	15	257	27.5	
	16	70	7.5	
Missed a period in past 4 months				
	Yes	54	13.6	
	No	342	86.4	
Number of periods missed				
	1	31	57.4	
	2	18	33.3	
	3	5	9.3	
Taking the Contraceptive Pill				
	Yes	11	2.8	
	No	380	97.2	
School				
	School 1	209	22.2	47.9
	School 2	457	48.6	27.1
	School 3	248	26.4	14.7
	Unclear	27	2.9	

Table 2.3. Means, 95% Confidence Intervals, standard deviations, and ranges of each measure. Each measure and sub-scale is calculated as a total score, excluding SCS-Y, which is calculated as a mean.

			95% Confidence Interval					
		Mean	**Lower Bound**	**Upper Bound**	**S.D.**	**Min**	**Max**	**N**
Age		13.49	13.39	13.59	1.54	11	16	934
EDE-QS		8.75	8.20	9.29	8.49	0	36	939
RFQY-5		19.75	19.35	20.14	6.12	5	30	935
CAPS	Self-oriented Perfectionism	38.14	37.56	38.72	9.08	12	60	941
	Socially Prescribed Perfectionism	27.95	27.38	28.53	8.98	6	49	941
DERS	Non-acceptance of emotional responses	15.04	14.61	15.48	6.79	3	30	931
	Difficulty Engaging in Goal-Directed Behaviour	14.81	14.48	15.15	5.23	3	25	931
	Impulse control difficulties	15.07	14.67	15.47	6.25	2	30	931
	Lack of Emotional Awareness	18.22	17.87	18.57	5.50	5	30	931
	Limited Access to Emotion Regulation Strategies	19.90	19.37	20.43	8.27	2	40	931
	Lack of Emotional Clarity	13.01	12.71	13.31	4.66	2	25	931
	Total	96.06	94.31	97.81	27.21	25	176	931
CAMM		23.70	23.13	24.27	8.84	0	40	939
SCS-Y	Self-kindness	2.82	2.75	2.89	1.06	1	5	857
	Self-judgement	3.15	3.08	3.23	1.18	1	5	857
	Common Humanity	2.76	2.69	2.83	1.09	1	5	857
	Isolation	3.23	3.15	3.30	1.10	1	5	857
	Over-identified	3.09	3.01	3.17	1.21	1	5	857
	Mindfulness	2.72	2.66	2.79	1.00	1	5	857
	Total	2.96	2.92	3.00	0.59	1	5	857
RSES		26.99	26.57	27.41	6.12	1	40	816
GFFAD		25.26	24.76	25.76	7.11	2	48	775
SIAQ		13.00	12.56	13.44	6.22	3	25	764
PROMIS-PPRS		19.53	18.96	20.10	7.93	0	32	749

Note. Abbreviations in table: EDE-QS, Eating Disorder Examination Questionnaire; RFQY-5, Reflective Functioning Questionnaire for Youth; CAPS, Child-Adolescent Perfectionism Scale; DERS, Difficulties in Emotion Regulation Scale; CAMM, Child and Adolescent Mindfulness Measure; SCS-Y, Self-Compassion Scale for Youth; RSES, Rosenberg Self-Esteem Scale; GFFAD, General Functioning subscale of the McMaster Family Assessment Device; SIAQ, the Sociocultural Internalization of Appearance Questionnaire; PROMIS-PPRS, PROMIS Pediatric Peer Relationships Scale.

Overall, students show moderate mentalisation ability. This is demonstrated by the RFQ-Y (mean = 19.75, S.D. = 6.12), as well as through moderate levels of alexithymia (DERS Lack of Emotional Clarity mean = 13.01, S.D. = 4.66) and mindfulness (CAMM mean = 23.7, S.D. = 8.84). Girls had significantly higher scores on the RFQ-Y ($t(911) = 2.365$, $p = .018$, Cohen's D = .158) but significantly lower scores on the CAMM ($t(914) = 7.062$, $p < .001$, Cohen's D = .470). Girls also had significantly higher scores on the DERS Lack of Emotional Clarity subscale ($t(908) = 7.226$, $p < .001$, Cohen's D = .483).

Students showed moderate scores on most of the risk factor measures, including internalisation of the thin ideal; perfectionism; self-compassion; mindfulness; poor emotion regulation; poor family functioning; and self-esteem. The mean score on the peer relationships scale suggests that at a group level, students have poor to moderate relationships with their peers. While students reported low levels of disordered thoughts and behaviours overall (EDE-QS mean = 8.75, S.D. = 8.49), the mean was highest for Desire for Weight Loss (mean = 1.06) and lowest for Purging (mean = .300) (see Figure 2.1 and Table 2.4.).

To assess whether the difference between means was significant, a repeated measures ANOVA was conducted. The data were not normally distributed (Shapiro Wilk, $p < .05$) and did not meet the assumption of sphericity (Mauchly's test, $p < .05$). However, there was a significant difference between the specific types of behaviours and thinking patterns reported by students ($F(5.72, 5152.9) = 117.42$, $p < .001$, $\eta 2 = .115$). Pairwise comparisons suggest that there were significant differences between each of the variables ($p < .05$) except for Restricting Food and Preoccupation with Food, Weight or Shape ($p = .217$), Restricting Food and Binge Eating ($p = .070$), Preoccupation with Food, Weight or Shape and Binge Eating ($p = .546$), Fear of Weight Gain and Compulsive Eating ($p = .456$) and Desire to Lose Weight and Body Dissatisfaction ($p = .052$).

Descriptive statistics for disordered behaviours vs disordered thinking, including means and standard deviations, are shown in Table 2.4. Students showed significantly more ED Cognitions than ED Behaviours ($t(935) = 22.52$, $p < .001$, Cohen's d = .736). Two-way mixed ANOVA results suggest that there is a gender difference: girls show significantly higher levels of disordered thinking compared to boys, but there is no significant difference in terms of disordered behaviours ($F(1, 912) = 68.98$, $p < .001$, $\eta 2 = .07$).

Figure 2.1 Bar chart showing the mean score on EDE-QS for weekly frequency of each individual eating disorder symptom.

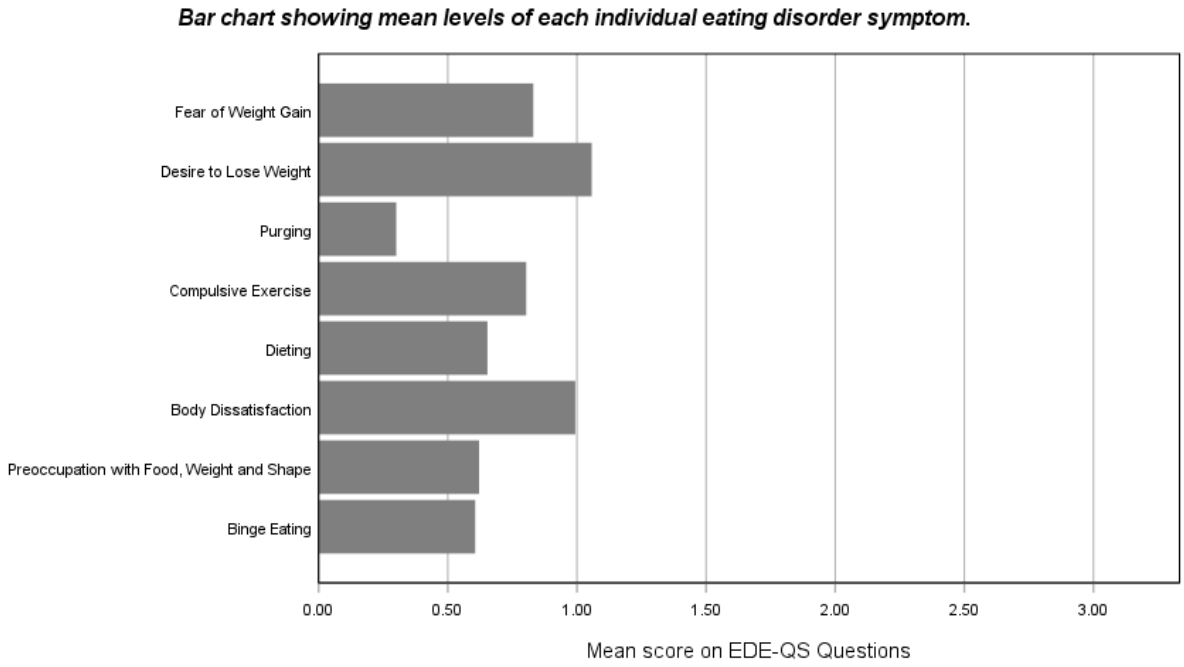

Table 2.4. *Means, 95% Confidence Intervals, standard deviations, and ranges of the disordered eating variables created from the EDE-QS.*

		95% Confidence Interval for Mean				
	Mean	Lower Bound	Upper Bound	S.D.	Minimum	Maximum
Restricting Food	.654	.599	.708	.835	0	3
Preoccupation with Food, Weight or Shape	.621	.565	.677	.858	0	3
Fear of Weight Gain	.831	.762	.901	1.06	0	3
Desire for Weight Loss	1.06	.980	1.14	1.18	0	3
Purging	.300	.252	.349	.736	0	3
Compulsive Exercise	.804	.734	.873	1.06	0	3
Binge Eating	.606	.552	.661	.828	0	3
Body Dissatisfaction	.994	.930	1.06	.983	0	3
Overall Disordered Behaviours	3.00	2.78	3.22	3.44	0	15
Overall Disordered Thinking	5.76	5.40	6.12	5.60	0	21

2.4.3 Correlational Analysis

In large samples, the Shapiro-Wilk test can be overly sensitive to deviations from normality, so in this instance, judgement is based on a combination of visual assessments, including Q-Q plots and histograms. From these visual assessments, the following variables appear to be approximately normally distributed: Age, CAMM, RFQY-5, DERS Total Score, DERS Lack of Emotional Clarity subscale, GF-FAD and CAPS (Self-Oriented and Socially Prescribed). SCS-Y, RSES, SIAQ-A, PROMIS-PPRS, and EDE-QS do not appear to be normally distributed. Despite the departures from normality in some of these variables, I decided to use Pearson's correlations because they are robust for many real-world situations and still provide meaningful insights into associations between variables. However, it's important to interpret the results in the context of the data's characteristics and the potential impact of non-normality. Table 2.5 and Table 2.6 shows all the Pearson correlations that were used to assess the relationships between the baseline measures.

2.4.3.1 Disordered Eating Behaviour and Mentalisation

There was a moderate, significant correlation between EDE-QS and DERS Lack of Emotional Clarity subscale ($r = .393$, $p < .001$) and between EDE-QS and CAMM ($r = -.438$, $p < .001$). However, there was no significant correlation between RFQY-5 and EDE-QS ($r = .032$, $p = .164$).

RFQ-Y did not correlate significantly with ED Behaviours but did correlate positively with ED Cognitions. However, the correlation coefficient was so small ($r = .056$) that it is likely that the significance is due to a Type 1 error. DERS Lack of Emotional Clarity correlated positively with ED Behaviours ($r = .311$) and ED Cognitions ($r = .407$). CAMM correlated negatively with ED Behaviours ($r = -.345$) and ED Cognitions ($r = -.454$).

RFQ-Y only correlated significantly with Purging ($r = -.063$) and Body Dissatisfaction ($r = .096$); however, because these coefficients were so small ($r < .1$), it is possible that the reported significance is merely a Type 1 error. For DERS Lack of Emotional Clarity, there were significant positive correlations with all of the individual symptoms, the biggest correlation coefficient being for Body Dissatisfaction ($r = .408$), and the smallest for Compulsive Exercise ($r = .170$) and Purging ($r = .179$). For CAMM, there were significant negative correlations with all of the individual symptoms, with the biggest correlation coefficient for Body Dissatisfaction ($r = -.493$) and the smallest for Purging ($r = -.165$).

2.4.3.2 Disordered Eating Behaviours and Potential Risk and Protective Factors for EDs

High levels of disordered eating behaviours were associated with elevated perfectionism (both self-oriented ($r = .308$) and socially prescribed ($r = .407$)), poor emotion regulation (including

non-acceptance of emotional responses (r = .461), difficulty with goal-directed behaviour (r = .348), difficulties with impulse control (r = .400), and inability to access regulation strategies (r = .478)), poor family functioning (r = .330) and elevated internalisation of the thin ideal (r = .512). High levels of disordered eating behaviours were associated with low self-esteem (r = -.433), and low overall self-compassion (r = -.409).

2.4.3.3 Mentalisation and Potential Risk and Protective Factors for EDs

For RFQ-Y, where high scores indicate good overall mentalisation ability, there was a negative correlation with emotion dysregulation (including lack of emotional awareness (r = -.469), lack of emotional clarity (r = -.161)) and poor family functioning (r = -.231). There was a positive correlation between RFQ-Y and peer relationships (r = .306), self-compassion (r = .175), self-esteem (r = .171) and self-oriented perfectionism (r = .226).

For DERS subscale Lack of Emotional Clarity, where higher scores indicate an uncertainty about one's own emotions, there were positive correlations with perfectionism (both self-oriented (r = .213) and socially prescribed (r = .348)), poor family functioning (r = .348) and internalisation of the thin ideal (r = .324). There were also negative correlations between DERS Lack of Emotional Clarity and mindfulness (r = -.551), self-compassion (r = -.531) self-esteem (r = -.475), and peer relationships (r = -.246).

Finally, for the CAMM, where higher scores indicate good ability to reflect on your own mind, there were significant negative correlations with perfectionism (both self-oriented (r = -.359) and socially prescribed (r = -.462)), emotion dysregulation (all subscales showed a correlation coefficient above r = -.450, except Lack of Emotional Awareness (r = -.052)), poor family functioning (r = -.318), and internalisation of the thin ideal (r = -.403). There were significant positive correlations with self-compassion (r = .482), self-esteem (r = .467), and peer relationships (r = .157).

Table 2.5. Pearson correlations between variables, shown to 2 decimal places.

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. EDE-QS	1																	
2. RFQY-5	.03	1																
3. Age	.01	.08**	1															
4. CAMM	-.44**	-.09**	-.01	1														
5. CAPS Self-Oriented	.31**	.23**	.07*	-.36**	1													
6. CAPS Socially Prescribed	.41**	.07*	.10**	-.46**	.55**	1												
7. DERS Non-Acceptance	.46**	.07*	.09**	-.59**	.44**	.47**	1											
8. DERS Goal-Directed Behaviour	.35**	.05	.08*	-.52**	.26**	.31**	.63**	1										
9. DERS Impulse Control	.40**	-.07*	.05	-.46**	.28**	.35**	.66**	.68**	1									
10. DERS Lack of Awareness	.03	-.47**	-.02	-.05	-.08**	.03	-.09**	-.07*	-.01	1								
11. DERS Strategies	.48**	.02	.07*	-.55**	.34**	.41**	.78**	.70**	.74**	-.02	1							
12. DERS Lack of Clarity	.39**	-.16**	.04	-.55**	.21**	.35**	.56**	.51**	.54**	.27**	.62**	1						
13. DERS Total	.49**	-.10**	.07*	-.62**	.34**	.45**	.84**	.79**	.84**	.21**	.90**	.78**	1					
14. SCS-Y Total	-.41**	.18**	-.04	.48**	-.37**	-.43**	-.53**	-.51**	-.53**	-.30**	-.63**	-.53**	-.69**	1				
15. RSES	-.43**	.17**	-.02	.47**	-.25**	-.38**	-.52**	-.40**	-.47**	-.20**	-.55**	-.48**	-.60**	.63**	1			
16. GFFAD	.33**	-.23**	.13**	-.32**	.10**	.34**	.37**	.32**	.39**	.22**	.41**	.35**	.47**	-.43**	-.48**	1		
17. SIAQ	.51**	.04	.14**	-.40**	.35**	.38**	.43**	.36**	.34**	.06*	.40**	.32**	.44**	-.42**	-.43**	.31**	1	
18. PROMIS-PPRS	-.09**	.31**	.04	.16**	.10**	-.07*	-.16**	-.14**	-.18**	-.22**	-.23**	-.25**	-.26**	.26**	.36**	-.40**	-.06	1

**. Correlation is significant at the 0.01 level (1-tailed).
*. Correlation is significant at the 0.05 level (1-tailed).

Note. Abbreviations in table: EDE-QS, Eating Disorder Examination Questionnaire; RFQY-5, Reflective Functioning Questionnaire for Youth; CAPS, Child-Adolescent Perfectionism Scale; DERS, Difficulties in Emotion Regulation Scale; CAMM, Child and Adolescent Mindfulness Measure; SCS-Y, Self-Compassion Scale for Youth; RSES, Rosenberg Self-Esteem Scale; GFFAD, General Functioning subscale of the McMaster Family Assessment Device; SIAQ, the Sociocultural Internalization of Appearance Questionnaire; PROMIS-PPRS, PROMIS Pediatric Peer Relationships Scale

Table 2.6. Pearson correlations between mentalisation, risk factor and protective factor variables, and disordered eating behaviours.

	Restricting Food	Preoccupation with Food, Shape and Weight	Fear of Weight Gain	Desire for Weight Loss	Purging	Compulsive Exercise	Binge Eating	Body Dissatisfaction	*Overall Disordered Behaviours*	*Overall Disordered Thinking*
SCS-Y	-.301**	-.329**	-.359**	-.291**	-.105**	-.223**	-.285**	-.470**	-.299**	-.438**
RSES	-.326**	-.367**	-.358**	-.322**	-.183**	-.220**	-.344**	-.415**	-.343**	-.446**
GFFAD	.265**	.275**	.218**	.189**	.261**	.196**	.320**	.269**	.325**	.301**
SIAQ	.346**	.403**	.442**	.439**	.197**	.258**	.361**	.546**	.375**	.545**
PROMIS-PPR	-.079*	-.086**	-.077*	-.043	-.135**	.001	-.092**	-.055	-.089**	-.081*
RFQY-5	-.019	.007	.029	.040	-.063*	.034	.021	.096**	-.012	.056*
CAMM	-.315**	-.337**	-.378**	-.285**	-.165**	-.259**	-.334**	-.493**	-.345**	-.454**
CAPS Self-Oriented Perfectionism	.210**	.226**	.297**	.261**	.068*	.205**	.213**	.323**	.225**	.328**
CAPS Socially-Prescribed Perfectionism	.284**	.308**	.332**	.292**	.182**	.288**	.312**	.416**	.340**	.410**
DERS Non-Acceptance	.343**	.370**	.374**	.310**	.265**	.292**	.360**	.451**	.394**	.459**
DERS Goal-Directed Behaviour	.253**	.290**	.309**	.231**	.144**	.169**	.255**	.378**	.258**	.372**
DERS Impulse Control	.302**	.351**	.339**	.245**	.267**	.200**	.343**	.343**	.344**	.396**
DERS Lack of Awareness	.051	.028	.026	.023	-.048	.000	-.031	.070*	.007	.037
DERS Strategies	.357**	.406**	.392**	.309**	.287**	.268**	.367**	.469**	.397**	.483**
DERS Lack of Clarity	.317**	.357**	.352**	.223**	.179**	.170**	.291**	.408**	.311**	.407**
DERS Total	.377**	.418**	.415**	.309**	.251**	.263**	.373**	.489**	.400**	.499**

**. Correlation is significant at the 0.01 level (1-tailed).
*. Correlation is significant at the 0.05 level (1-tailed).

Note. Abbreviations in table: RFQY-5, Reflective Functioning Questionnaire for Youth; CAPS, Child-Adolescent Perfectionism Scale; DERS, Difficulties in Emotion Regulation Scale; CAMM, Child and Adolescent Mindfulness Measure; SCS-Y, Self-Compassion Scale for Youth; RSES, Rosenberg Self-Esteem Scale; GFFAD, General Functioning subscale of the McMaster Family Assessment Device; SIAQ, the Sociocultural Internalization of Appearance Questionnaire; PROMIS-PPRS, PROMIS Pediatric Peer Relationships Scale.

2.4.4 Predicting Eating Disorder Risk

Scores above 15 on the EDE-QS suggests that an individual may be at risk of an ED (Gideon et al., 2016; Prnjak et al., 2020). I split the sample into Low Risk (a score of less than 15) and High Risk (a score of more than 15). There were 693 students in the Low-Risk group, and 246 in the High-Risk group.

A logistic regression analysis examined the relationship between mindfulness (CAMM), alexithymia (DERS Lack of Emotional Clarity), overall mentalisation (RFQ-Y), and ED risk category (Low Risk vs. High Risk). Linearity of the continuous variables with respect to the logit of the dependent variable was assessed via the Box-Tidwell procedure, where the interaction terms between the continuous predictors and their natural logs are examined. All tested continuous independent variables exhibited non-significant relationships with the logit of the dependent variable (DERS Lack of Emotional Clarity, $p = .746$; RFQ-Y, $p = .143$; CAMM, $p = .481$). These findings indicate that all predictors demonstrated a linear relationship to the logit of the dependent variable. There were 10 standardised residual with a value more than 3 standard deviations. While outliers can sometimes have a significant impact on the results of analysis, I chose to retain these cases because of the large sample size, the robustness of logistic regression and to maintain data integrity (e.g. to avoid compromising the representativeness and generalisability of the results). The omnibus tests of model coefficients indicated that the model significantly predicted ED risk category (χ^2 (3) = 143.099, $p < .001$). The model accounted for 14.4% of the variance in ED risk category according to Cox & Snell R^2, and 20.9% according to Nagelkerke R^2. The Hosmer and Lemeshow test indicated that the model was a good fit to the data (χ^2 (8) = 7.788, $p = .454$).

CAMM (B = -.075, SE = .012, Wald = 40.875, $p < .001$), DERS Lack of Emotional Clarity (B = .095, SE = .021, Wald = 19.970, $p < .001$), and RFQ-Y (B = .015, SE = .015, Wald = 1.036, $p = .309$) were included as predictors of ED risk category. The odds of being in the high-risk category decreased by a factor of 0.927 for every one-unit increase in CAMM and increased by a factor of 1.10 for every one-unit increase in DERS Lack of Emotional Clarity. RFQ-Y was not a significant predictor of ED risk category. The classification table showed that the model correctly predicted 74.9% of cases overall. Specifically, the model correctly classified 93.4% of low-risk cases and 23.7% of high-risk cases. These results suggest that some aspects of mentalisation about oneself could be important predictors of ED risk, with higher levels of mindfulness associated with lower ED risk level and higher levels of alexithymia (i.e. lack of emotional clarity) associated with higher ED risk level.

A second logistic regression analysis was conducted to examine the relationship between ED risk category (Low Risk vs High Risk) and non-mentalisation factors. I included Age,

Perfectionism (Self-Oriented and Socially Prescribed), Emotion Dysregulation (DERS Total score), Self-Compassion, Self-Esteem, Family Functioning, Internalisation of Thin Ideal, Peer Relationships and Gender. The Box-Tidwell (1962) procedure assessed the linearity assumption between the continuous predictors and the logit of the dependent variable. Each continuous variable's relationship with the log odds of the dependent variable was examined through their corresponding interaction terms. All continuous independent variables demonstrated non-significant relationships with the logit of the dependent variable (all $p > .05$). As a result, these findings indicate that all continuous predictors satisfied the assumption of linearity in the logistic regression model. There were no standardised residuals with a value more than 3 standard deviations. The omnibus tests of model coefficients indicated that the model significantly predicted ED risk category (χ^2 (10) = 227.2, $p < .001$). The model accounted for 27.5% of the variance in ED risk category according to Cox & Snell R^2, and 39.7% according to Nagelkerke R^2. The Hosmer and Lemeshow test indicated that the model was a good fit to the data (χ^2 (8) = 13.3, $p = .101$). The classification table showed that the model correctly predicted 78.8% of cases overall. Specifically, the model correctly classified 91.6% of low-risk cases and 45.1% of high-risk cases. Of the ten predictor variables, six were statistically significant: Age, Socially Prescribed Perfectionism, Emotion Dysregulation, Self-Esteem, Family Functioning and Internalisation of Thin Ideal (see Table 2.7). Increasing Socially Prescribed Perfectionism, Emotion Dysregulation, Poor Family Functioning, and Internalisation of Thin Ideal were associated with an increased likelihood of being in the High-Risk category, while increasing age and Self-Esteem was associated with a reduction in the likelihood of being in the High-Risk category.

Table 2.7 Logistic regression predicting membership of High-Risk ED Category.

	B	**S.E.**	**Wald**	***df***	***p***	**Odds Ratio**	**95% C.I. for Odds Ratio**	
							Lower	Upper
Age in Years	-.324	.070	21.6	1	.000	.723	.631	.829
Child-Adolescent Perfectionism Scale Self-Oriented Perfectionism	-.006	.014	.163	1	.687	.994	.966	1.02
Child-Adolescent Perfectionism Scale Socially Prescribed Perfectionism	.043	.015	8.41	1	.004	1.04	1.01	1.07
Difficulties in Emotion Regulation Scale Total Score	.018	.006	10.2	1	.001	1.02	1.01	1.03
Self-Compassion Scale for Youth	.195	.279	.492	1	.483	1.22	.704	2.10
Rosenberg Self-Esteem Scale	-.053	.027	3.85	1	.050	.948	.899	1.00
General Functioning subscale of the McMaster Family Assessment Device	.054	.019	8.09	1	.004	1.06	1.02	1.10
Sociocultural Internalization of Appearance Questionnaire	.131	.020	42.2	1	.000	1.14	1.10	1.19
PROMIS Pediatric Peer Relationships Scale	.007	.015	.230	1	.631	.007	.977	1.04
Sex	-.053	.213	.062	1	.803	.948	.624	1.44
Constant	-2.09	1.68	1.55	1	.213	.124		

Note: Sex is for males compared to females.

A multiple linear regression analysis was conducted to examine the relationship between mentalisation and ED Behaviours. There was linearity as assessed by partial regression plots, a plot of studentized residuals against the predicted values, and scatterplots between the predictor variables and ED Behaviours (Mindfulness R^2 = .119; DERS Lack of Emotional Clarity R^2 = .10; RFQY R^2 = .10). There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.958. There was homoscedasticity, as assessed by visual inspection of a plot of studentised residuals versus unstandardized predicted values, and a correlation of r = 0. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. There were 10 studentized deleted residuals greater than ±3 standard deviations, but as there were no leverage values greater than 0.2, or values for Cook's distance above 1, I decided not to remove these outliers. The assumption of normality was not met, as assessed by a Q-Q Plot and the histogram of regression standardized residual, as well as Shapiro Wilk test (W = 0.831, p < .001). It is essential to bear in mind that statistical assumptions serve as guidelines rather than rigid constraints. Given the focus of the study on disordered eating behaviours within a non-clinical sample of young individuals, I anticipated the presence of positive skewness in these behaviours. Consequently, I opted to proceed with the multiple regression analysis. The model summary shows that the model with three predictors (RFQ-Y, CAMM, and DERS Lack of Emotional Clarity) explained 13.8% of the variance in ED Behaviours, F(3, 916) = 49.1, p < .001, adj. R^2 = .13.6. Regression coefficients and standard errors can be found in Table 2.8. The coefficients table shows that, for the first model, CAMM and DERS Lack of Emotional Clarity were significant negative and positive predictors, respectively, of ED Behaviours. RFQ-Y was not a significant predictor.

Table 2.8 Multiple regression results for ED Behaviours.

Model			**95% CI for B**					
		B	Lower Bound	Upper Bound	*SE B*	β	R^2	Δ R^2
Model 1	(Constant)	3.81***	2.22	5.40	.809		.138	.136
	CAMM	-.097***	-.126	-.068	.015	-.249***		
	DERS Lack of Emotional Clarity	.125**	.070	.180	.028	.170**		
	RFQY-5	-.005	-.041	.030	.018	-.010		

Note. Model = “Enter” method in SPSS Statistics; B = unstandardized regression coefficients; 95% CI for B = 95% confidence interval for B; SE B = standard error of the regression coefficients; β = standardized regression coefficients; R^2 = coefficient of determination; ΔR^2 = adjusted R^2. *p < .05, **p < .01, ***p < .001.

A multiple linear regression analysis was conducted to examine the relationship between mentalisation and ED Cognitions. There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values, and scatterplots between the predictor variables and ED Behaviours (Mindfulness R^2 = .21; DERS Lack of Emotional Clarity R^2 = .17; RFQY R^2 = .10). There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.05. There was homoscedasticity, as assessed by visual inspection of a plot of studentised residuals versus unstandardized predicted values, and a correlation of r = 0. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. There were 5 studentized deleted residuals greater than ±3 standard deviations, but as there were no leverage values greater than 0.2, or values for Cook's distance above 1, I decided not to remove these outliers. The assumption of normality was not met, as assessed by a Q-Q Plot and the histogram of regression standardized residual, and the Shapiro-Wilk test (W = 0.887, p < .001). The model summary shows that the model with three predictors (RFQ-Y, CAMM, and DERS Lack of Emotional Clarity) explained 24.5% of the variance in ED Cognitions, F(3, 919) = 99.2, p < .001, adj. R^2 = .242. Regression coefficients and standard errors can be found in Table 2.9. The coefficients table shows that, for the first model, CAMM and DERS Lack of Emotional Clarity were significant negative and positive predictors, respectively, of ED Cognitions. RFQ-Y was not a significant predictor.

Table 2.9 Multiple regression results for ED Cognitions.

Model			**95% CI for B**					
		B	Lower Bound	Upper Bound	*SE B*	β	R^2	Δ R^2
Model 1	(Constant)	5.56***	3.15	7.97	1.23		.245	.242
	CAMM	-.199***	-.243	-.156	.022	-.314***		
	DERS Lack of Emotional Clarity	.290***	.207	.373	.042	.243***		
	RFQY-5	0.066	.007	.114	.027	.066		

Note. Model = “Enter” method in SPSS Statistics; B = unstandardized regression coefficients; 95% CI for B = 95% confidence interval for B; SE B = standard error of the regression coefficients; β = standardized regression coefficients; R^2 = coefficient of determination; ΔR^2 = adjusted R^2. *p < .05, **p < .01, ***p < .001.

2.4.5 Predicting Mentalisation

To assess potential predictors for overall student mentalisation, I created a categorical variable of Mentalising Ability from the RFQ-Y, DERS Lack of Emotional Clarity and CAMM scores. The two categories for the variable were Low Mentalisation (which indicates that a student is below the median on at least two of the mentalisation scales) and High Mentalisation (which indicates that a student is above the median on at least two of the mentalisation scales). A logistic regression analysis was conducted to examine the relationship between Mentalising Ability and psychosocial factors. Linearity of the continuous variables with respect to the logit of the dependent variable was assessed via the Box-Tidwell procedure; all continuous independent variables were found to be linearly related to the logit of the dependent variable. There was no standardized residual with a value more than 3 standard deviations. Predictor variables were age, Perfectionism (Self-Oriented and Socially Prescribed), Emotion Dysregulation (DERS Total score), Self-Compassion, Self-Esteem, Family Functioning, Internalisation of Thin Ideal, Peer Relationships and Gender. The omnibus tests of model coefficients indicated that the model significantly predicted Mentalising Ability category (χ^2 (10) = 74.8, $p < .001$). The model accounted for 10.1% of the variance in Mentalising Ability category according to Cox & Snell R^2, and 13.4% according to Nagelkerke R^2. The Hosmer and Lemeshow test indicated that the model was a good fit to the data (χ^2 (8) = 11.4, $p = .180$). The classification table showed that the model correctly predicted 64.6% of cases overall. Specifically, the model correctly classified 72.9% of Low Mentalisation and 55% of High Mentalisation. Of the predictor variables, four were statistically significant: Self-Oriented Perfectionism, Self-Compassion, Family Functioning and Peer Relationships (see Table 2.10). Increasing Self-Oriented Perfectionism and Self-Compassion, and better Peer Relationships, were associated with an increased likelihood of being in the High Mentalisation category, while increasing poor Family Functioning was associated with lower likelihood of being in the High Mentalisation category.

Table 2.10 Logistic regression predicting membership of High Mentalisation Category.

	B	S.E.	Wald	*df*	*p*	Odds Ratio	95% C.I. for Odds Ratio	
							Lower	Upper
Age in Years	.076	.053	2.07	1	.150	1.08	.973	1.20
Child-Adolescent Perfectionism Scale Self-Oriented Perfectionism	.053	.012	20.3	1	.000	1.06	1.03	1.08
Child-Adolescent Perfectionism Scale Socially Prescribed Perfectionism	-.009	.012	.615	1	.433	.991	.968	1.01
Difficulties in Emotion Regulation Scale Total Score	-.002	.005	.259	1	.611	.998	.989	1.01
Self-Compassion Scale for Youth	.530	.219	5.86	1	.015	1.70	1.11	2.61
Rosenberg Self-Esteem Scale	.008	.021	.142	1	.707	1.01	.967	1.05
General Functioning subscale of the McMaster Family Assessment Device	-.030	.015	4.17	1	.041	.970	.942	.999
Sociocultural Internalization of Appearance Questionnaire	.011	.016	.458	1	.499	1.01	.980	1.04
PROMIS Pediatric Peer Relationships Scale	.027	.012	5.27	1	.022	1.03	1.00	1.05
Sex	-.115	.168	.465	1	.495	.892	.641	1.24
Constant	-4.37	1.38	10.1	1	.001	.013		

Note: Sex is for males compared to females.

2.5 Discussion

2.5.1 Overview of Results

The primary study aim was to examine the relationship between mentalisation and disordered eating in a non-clinical, community sample of adolescents, and to establish whether there were relationships between mentalisation and established risk or protective factors for eating disorders. The results suggest that there is a relationship between ED symptoms and mentalising ability about oneself: higher frequency of ED symptoms is associated with poor ability for mindfulness and poor clarity about one's feelings. Mentalising about yourself predicts, with reasonable precision, one's risk of scoring above a commonly used cut off for clinically significant ED psychopathology: good ability for mindfulness reduces one's chance of having an EDE-QS score of 15 or above, while lack of emotional clarity increases the odds of being in the high risk group. The results also suggest that, for this sample, mentalising ability is most strongly associated with Body Dissatisfaction: alexithymia and poor mindfulness ability are associated with higher frequency of thoughts related to body dissatisfaction.

In terms of the secondary aims of the study, the results suggest that different aspects of mentalisation correlate with different risk and protective factors. For context, higher frequency of ED symptoms was associated with elevated perfectionism, emotion dysregulation, family dysfunction, and internalisation of the thin ideal, and low levels of self-esteem and overall self-compassion. For overall mentalisation ability, good ability was associated with lower levels of emotion dysregulation, good self-esteem, good family functioning and peer relationships, higher levels of self-compassion and more perfectionism. Ability for mindfulness was associated with low levels of perfectionism, emotion dysregulation and internalisation of the thin ideal, high self-esteem, and good family functioning, self-compassion and peer relationships. Heightened alexithymia was associated with elevated perfectionism and internalisation of the thin ideal, poor family functioning, low self-esteem, poor peer relationships and low ability for self-compassion. Regression analysis demonstrated that probable predictors of ability for mentalisation include self-compassion, with heightened self-compassion associated with high mentalising ability; and perfectionism, where self-oriented perfectionism is associated with higher mentalising ability, but socially determined perfectionism is not. Additionally, better relationships with peers and family are associated with higher mentalising ability.

2.5.2 Synthesis with Previous Research

Overall, the current research supports previous studies examining disordered eating and aspects of mentalisation. Various studies have demonstrated that good ability for mindfulness

is related to lower levels of body dissatisfaction and disordered eating in adults and young people, while alexithymia regularly correlates with heightened eating disorder behaviours (Calaresi & Barberis, 2019; Rothschild-Yakar et al., 2019). My results demonstrate that, in a diverse, non-clinical adolescent sample, high eating disorder symptomatology can be predicted by an inability to recognise and describe one's emotions, and low eating disorder symptomatology can be predicted by good ability to reflect on the present moment in a non-judgemental manner. Both alexithymia and mindfulness can be improved through effective intervention (Gu et al., 2015; Lombardi et al., 2022; Norman et al., 2019); integrating self-mentalisation skills training into eating disorder prevention programmes may be beneficial in enhancing adolescents' abilities to both regulate their emotions and prevent disordered eating behaviours.

The results of the analysis indicate that the Sociocultural Internalization of Appearance Questionnaire - Adolescents (SIAQ-A), which measures the extent to which adolescents internalise society's beauty ideals, had the strongest positive relationship with EDE-QS among the variables examined. This is consistent with prior research indicating that the internalisation of appearance ideals is associated with elevated levels of eating disorder symptomatology (Agras, Stice & Spangler, 2001; Marks, De Foe & Collett, 2020; Thompson & Stice, 2001). A strong negative correlation was found between scores on the CAMM and the SIAQ-A, suggesting that higher levels of mindfulness are associated with lower levels of internalisation of appearance standards related to the thin ideal in this diverse, non-clinical sample of adolescents. Several variables correlated strongly with both disordered eating and self-mentalisation, including socially prescribed perfectionism, internalisation of the thin ideal, emotion dysregulation, self-esteem and self-compassion. Successful ED prevention programmes, such as the Body Project (Stice, Onipede & Marti, 2021), have targeted poor body image and internalisation of the thin ideal through the use of cognitive dissonance principles (Dakanalis, Clerici & Stice, 2019; Stice, Onipede & Marti, 2021). Interventions aimed at improving mindfulness have also shown some success in reducing weight and body shape concerns amongst adolescents (Atkinson & Wade, 2015; Atkinson & Wade, 2016), as have interventions addressing perfectionism (Robinson & Wade, 2021). My findings suggest that future research should focus on incorporating techniques aimed at improving child and adolescent self-mentalisation (particularly emotional clarity and mindfulness) into prevention programmes, as this has the potential to improve self-esteem and self-compassion, reduce the impact of beauty ideals and so reduce the risk of disordered eating.

Based on the current results and prior evidence, it is plausible to hypothesise that deficits in self-mentalisation could indirectly contribute to the development of disordered eating behaviours by adversely affecting an individual's tendency for perfectionism, degree of

internalisation of beauty standards, and capacity for emotional regulation. This suggestion is supported by research indicating that poor self-mentalisation is associated with a range of negative psychological outcomes and difficulties with interpersonal relationships (Bateman & Fonagy, 2019; Ivanova et al., 2015). Alternatively, it is plausible to hypothesise that mindfulness, an element of self-mentalisation, could protect one against the emergence of thought patterns associated with disordered eating. Through fostering improvements in body satisfaction and emotion regulation, mindfulness may facilitate the development of more compassionate and accepting attitudes towards the self, leading to enhanced self-esteem. Elevating these abilities could ultimately contribute to the prevention of disordered eating behaviours. These hypotheses could be tested by conducting mediation analysis in future, longitudinal studies to determine the extent to which these variables mediate the relationship between mentalisation and disordered eating in adolescents.

Adolescence is a critical period for the development of mentalisation abilities (Blakemore, 2008; Goddings et al., 2012). Adolescence is also a period of heightened vulnerability for the development of disordered eating behaviours. It is therefore surprising that, in this study, there was no correlation between age and mentalisation, although it does appear that older age may be associated with a decreased chance of being in the high-risk category for developing an eating disorder.

2.5.3 Patient and Public Involvement

Young people from the Listen to Act PPI group were invited to provide feedback on the initial results. One participant reported that they felt that boys may be more likely to engage in compulsive exercise or purging than girls because boys are less able to talk about their feelings and so use external strategies to regulate their emotions. The PPI group agreed that it made sense that being uncertain about emotions would predict high risk of ED. Multiple participants reported that they felt that if you were not able to recognise your emotions you would be more likely to use unhelpful strategies like bingeing or exercising, rather than ask others for support. However, one young person reported that they had experience of an ED and felt that the relationship between uncertainty about emotions and disordered eating may be too simple. They reported that they felt that uncertainty about emotions increased anxiety, and that anxiety predicts disordered eating, as it is used to manage anxiety. They suggested that anxiety and depression scales should be included in future samples. The young person also reported that they felt that they became more certain about their emotions the more they engaged in disordered behaviours, suggesting that the relationship may not be straightforward, and that mediation analysis exploring how different aspects of mentalisation interact with risk factors for disordered eating may be needed in the future to understand this. One participant reported that they felt that there are likely to be two categories of people who

engage in ED behaviours: those who struggle to understand their own emotions and so use disordered eating to regulate their emotions (i.e. uncertainty about mental states), and those who were erroneously certain about mental states in themselves and others who may engage in these behaviours because they are certain that conforming with society's ideal body shape is the right thing to do (i.e. possible hyper-mentalising). There was discussion about the relationship between self-esteem and mentalisation, and self-esteem and disordered eating. The correlations suggest that for all three mentalisation measures, poor ability to reflect on mental states is associated with decreased self-esteem, and high self-esteem was associated with lower levels of disordered eating behaviours. One participant reported that they felt the correlation made sense because they felt that if you have more insight into your emotions, you would have higher self-esteem because you would be less susceptible to peer influences, and this would make you less likely to engage in potentially disordered behaviours. However, one participant reported that this might not be the whole picture: if your self-esteem is tied to your appearance, engaging in disordered behaviours might make you feel like you are achieving your goal and so improve your self-worth, but improved self-esteem might not affect how able you are at reflecting on how your behaviour is affecting you and others. Both participants suggested that there might be something else going on than the simple correlation suggests, again indicating the need for future mediation and moderation analysis.

2.5.4 Limitations

The Covid-19 pandemic had a significant impact on education systems globally. In England, it is estimated that 270 million days of education were lost because of Covid-19 (UK Department for Education., 2023). One of the challenges faced by schools was striking the balance between getting involved in various activities that may benefit students' overall education and well-being, and prioritising teaching time. In this context, numerous schools were hesitant to participate in research activities. Staff reported feeling unable to spare lesson time, as students had already missed a substantial amount of teaching because of the pandemic. This significantly hindered the recruitment process as getting students to complete questionnaires during class time was an important aspect of the research design. Combined with the time limitations of pursuing a PhD, my recruitment efforts were restricted to London schools that had established connections with the North West London Schools Research Network. This has raised concerns about the representativeness of the sample, as the demographics of London differ significantly from the rest of the UK. While the study's diverse demographics are an advantage in many respects, as we now have information on disordered eating behaviours in a population that are rarely included in eating disorder research, this also means that the sample may not accurately reflect the wider UK school population. The study

has the potential to be extended, to increase participation from schools across the country to ensure that the findings are representative of and applicable to the wider population.

Engaging adolescents in tasks that fail to captivate their interest can present an arduous undertaking, as attested by those who have spent time working with them. Upon reviewing the raw data, it became apparent that some students were not fully engaged with the questions. For instance, some students provided irrelevant responses, such as one student suggesting that eating a KFC is a solution to eating disorders, while another expressed reluctance to participate by writing "Do I have to?" instead of signing the consent form. Although less than 200 students who completed the consent questionnaires did not take part in the study, this lack of engagement may explain why some students opted not to participate in the study or provided incomplete responses. Thirty-two students spent less than a minute on the questionnaire, selected the same answer for every question, or answered only the first question of each questionnaire before moving on to the next, and were removed from the analysis. Feedback from teachers indicated that the questionnaires were too lengthy and were often too wordy, and suggested that students could lose interest, despite input from PPI groups and piloting on different young people. In addition, some students expressed a preference for completing questionnaires at home to avoid potential scrutiny from other students. Although I excluded participants who appeared to have not completed the questionnaires properly, it is worth noting that the lack of engagement with the questionnaires may have introduced invisible confounding variables that are challenging to disentangle and could potentially impact the results.

Due to the COVID-19 pandemic and the impact it had on schools and education, using a longitudinal design where data is collected at useful timepoints was not feasible. Additionally, I decided to use an anonymous data collection technique to encourage student participation; this, however, limited my ability to track participants over time to collect data at different timepoints. Therefore, a cross-sectional design was deemed the most appropriate. However, using a cross-sectional design to assess disordered eating behaviours has limitations that affects what we can infer about causal pathways and developmental trajectories, especially for participants experiencing adolescence. Adolescence is a critical period for the identification and treatment of disordered eating behaviours, and the median age of onset of any eating disorder is 17 years old (Solmi et al., 2022). Cross-sectional investigations are hindered by their inability to track changes over time, which is particularly pertinent in the domain of eating behaviours, which are susceptible to fluctuations in response to various factors such as stress, hormonal changes, mood, and life events, all of which are common in the context of adolescence. By not tracking changes over time, cross-sectional studies can miss critical windows for intervention and provide an incomplete picture of behaviours. Another limitation

of cross-sectional studies is the inability to establish causal relationships between variables. While cross-sectional studies can identify associations between variables, they cannot determine causal relationships. Additionally, cross-sectional studies do not allow for the examination of dynamic relationships between variables. For example, certain statistical analyses, such as mediation or moderation analyses, require longitudinal data to examine underlying mechanisms of relationships. These limitations hinder the ability of researchers and clinicians to develop effective prevention and intervention strategies for disordered eating behaviours.

For the sake of continuity, I decided to use the EDE-QS in this study, as I had used it for my previous studies. While the EDE-QS has been shown to be a reliable and valid measure in clinical samples (Gideon et al., 2016; Prnjak et al., 2020), there are some potential problems when using it in non-clinical samples (i.e. school children not seeking support for an eating disorder). Firstly, the EDE-QS was originally developed and validated in clinical populations, which means that the items on the questionnaire may not be as relevant or meaningful for young people who do not have a diagnosable eating disorder. Some items may not apply to those who do not engage in *extreme* behaviours, reducing the measure's ability to detect less severe eating disorder symptoms. Young people who have not had experience of an eating disorder may have a different understanding and interpretation of some of the EDE-QS items. For example, the question about binge-eating is, "*On how many of these days… did you eat what other people would regard as an unusually large amount of food in one go?*" Use of the term "unusually large" may be difficult to understand for those who are not aware of binge-eating. Equally, the question about exercise is "*Have you exercised in a driven or compulsive way as a means of controlling your weight, shape or body fat, or to burn off calories?*" One teacher reported that the words "driven" and "compulsive" are ambiguous, and suggested that younger students might not recognise how to respond to this question, leading to response biases and inaccurate assessment of symptoms. I provided a brief lesson to each participating class on recognising disordered eating, including what bingeing and compulsive exercise means, so that students had a better understanding of the questions, but it is possible that more information would be needed for a non-clinical adolescent population. Other self-reports about disordered eating may have been more appropriate, such as the Eating Disorder Diagnostic Scale (EDDS) (Stice, Telch & Rizvi, 2000).

Finally, the potential overlap among the items used in this study should be acknowledged, as such overlap could artificially inflate the observed associations. Notably, when examining constructs like self-esteem and self-compassion, emotion regulation and mindfulness, one should recognise that these domains may share common elements, potentially affecting the relationships under investigation and influencing interpretation of the results. My plan for future

analyses is to prioritise addressing the issue of item overlap, through employing statistical techniques, such as factor analysis or structural equation modelling, to disentangle the intertwined and distinct aspects of these overlapping constructs. This will allow for a more nuanced understanding of the variable relationships. Additionally, any future replications of the study should consider the use of more precise measures tailored to capture the unique facets of each construct, to effectively reduce the risk of artificial inflation and enhance the accuracy of result interpretation.

2.5.5 Future Directions

By conducting a thorough analysis of the available dataset, it is possible to identify several potential factors that may contribute to the development of good mentalising ability, and potential predictors of the development of eating disorders, in adolescents. However, it is important to note that, due to the cross-sectional nature of the study, additional data collection is necessary to track the evolution of these variables and explore further factors that may affect the risk of developing an eating disorder or experiencing abnormal mentalisation. This requires a longitudinal research design, which I would recommend involves collecting data from participants every two years between the ages of 10 and 24, as experts in the field of adolescent development have proposed that adolescence should be considered as a period between 10 and 24 years of age (Sawyer et al., 2018). This age range is particularly relevant to the study of eating disorders, which are most commonly diagnosed during this developmental period (Solmi et al., 2022). Furthermore, research has shown that mentalisation ability continues to develop until the mid-20s (Blakemore, 2008; Goddings et al., 2012). Given the potential importance of psychosocial factors as highlighted in the current dataset in the development of mentalisation and disordered eating, it is crucial to collect data at important milestones of adolescence in order to better understand the developmental trajectory of these factors. For instance, collecting data at ages 10-11 would provide valuable insights into how the transition from primary to secondary school impacts cognitive development. Similarly, collecting data at ages 15-16 would allow researchers to explore the potential impact of GCSE preparation and exams on psychosocial factors such as self-esteem. By collecting data every two years during adolescence, researchers can map the development of critical psychosocial factors. Such an approach will help to enhance our understanding of the developmental trajectory of both eating disorders and mentalisation during adolescence and young adulthood, and identify potential risk and protective factors that may have a significant impact on clinical and social outcomes.

Using multiple forms of measurement for mentalisation and integrating measurements of individual aspects of mentalisation would provide a more comprehensive understanding of mentalising abilities. Mentalisation is a complex process that involves many different aspects,

including Theory of Mind, empathy, mindfulness, and alexithymia. Equally, mentalisation is a construct that can be characterised along several extreme poles, including automatic-controlled, internal-external, self-other, and cognitive-affective dimensions. Using only one form of measurement (e.g. just questionnaires) may provide a limited view of mentalisation, and using multiple forms of measurement can provide a more accurate and detailed picture. Interviews, questionnaires, and observations are all useful methods for assessing mentalisation: interviews can provide detailed information about experiences, while questionnaires can provide a standardised measure that is easily comparable across students. Parent or teacher observations can provide insight into students' social behaviours in real-life situations, and provide a more objective measure of mentalisation, compared to self-report. Furthermore, integrating measurements of individual aspects of mentalisation can provide a more nuanced understanding of an individual's mentalising abilities. In the current study, I measured alexithymia and mindfulness alongside the RFQ-Y questionnaire; in the future, I would advise including measures of Theory of Mind and empathy as well. By measuring mentalisation in a variety of ways, and through measuring separate constructs of mentalisation, we can better understand how different constructs are related and how they impact each other. For example, while a questionnaire about mindfulness or alexithymia can measure controlled mentalisation about the self, observations from other questionnaires on Theory of Mind or empathy can measure automatic mentalisation about others. Using multiple forms of measurement for mentalisation and integrating measurements of individual aspects of mentalisation can provide a more comprehensive understanding of an individual's mentalising abilities.

In conversations with other researchers and clinicians, another suggestion for future research would be to incorporate information from parents and teachers. Due to the nature of my study design, this was difficult to do; however, comparing parent and teacher reports on mentalisation and eating behaviour with students' self-reports can help identify discrepancies and provide a more comprehensive picture of the child's mental state. In addition, examining factors related to attachment, early childhood experiences, and physical health can further enhance our understanding of the relationship between mentalisation and eating behaviour in similar samples to the one used in my study. Researchers can explore whether parents' own mentalisation abilities are associated with disordered eating behaviours in their children (see Chapters 3 and 4). Equally, teacher reports can also be useful in providing insight into how students use mentalisation in their interactions with peers and friends at school. Incorporating multiple perspectives and sources of data can enhance the validity and reliability of research findings in this field. By broadening the scope of inquiry beyond self-reports, researchers can develop a more nuanced understanding of the complex interplay between mentalisation and

eating behaviour in young people. From the PPI group, one participant felt that the demographics of the school also needed to be taken more into account, as there may be differences in displayed behaviour between schools with more girls versus schools with more boys, and schools in deprived areas compared to those in affluent areas. Additionally, one participant reported that it would be helpful to include a measure of autistic traits (whether self-report or parent/teacher rated), as they felt that this would affect both the gender differences in terms of disordered eating, and also emotional clarity. They suggested that people with autism might be more able to understand their own internal states, but struggle to recognise others'. These factors may be important to understand in terms of disordered eating.

2.5.6 Conclusion

The study findings suggest that mentalisation is related to disordered eating behaviours among adolescents in a non-clinical population. The ability to recognise and describe one's own emotions appears to be particularly important in this relationship. The study also identified specific risk and protective factors associated with mentalisation, such as perfectionism, emotion regulation, and internalisation of appearance ideals. Addressing sociocultural factors and improving emotional awareness and regulation, self-esteem, and self-compassion may be crucial in preventing disordered eating behaviours. Mentalisation-based interventions, with a focus on improving self-mentalisation, may also be effective in promoting positive body image and reducing the risk of disordered eating behaviours, in combination with interventions challenging the thin ideal. The study's limitations, such as the cross-sectional design and potential sampling bias, must be taken into account when interpreting the results. Additional longitudinal research is necessary to track the developmental trajectory of mentalisation and disordered eating behaviours, as well as other potential factors that may affect these relationships. Integrating multiple forms of measurement and incorporating information from parents, teachers, and other sources may provide a more comprehensive understanding of these issues.

In conclusion, the study highlights the importance of mentalisation in understanding disordered eating behaviours among adolescents and identifies potential risk and protective factors associated with mentalisation. These findings have important implications for prevention efforts and suggest that mentalisation-based interventions may be effective in promoting positive body image and reducing the risk of disordered eating behaviours. However, further research is necessary to address the limitations of the current study and to enhance our understanding of these issues.

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Chapter 3: How Does Mentalisation Change Through Treatment for Anorexia Nervosa and What Predicts Any Change?

3.1. Introduction

Eating disorders (EDs) are complex mental health problems, affecting a significant proportion of the population (American Psychiatric Association, 2013; Keski-Rahkonen & Mustelin, 2016; Schmidt et al., 2016; Treasure, Duarte & Schmidt, 2020). EDs are associated with a variety of harmful behaviours, including bingeing, purging and dietary restriction (American Psychiatric Association, 2013; National Institute for Health and Care Excellence, 2020). Anorexia Nervosa (AN) in particular is an ED associated with elevated mortality and high relapse rates (Arcelus et al., 2011; Fichter & Quadflieg, 2016; Smink, van Hoeken & Hoek, 2012). ED onset most commonly occurs in early adolescence, with ED behaviours reported by over 40% of girls and boys under 16 years old (Bould et al., 2018; Wilksch et al., 2020). EDs are notoriously difficult to treat effectively: repeated hospital admission, older age at first admission, poor psycho-social functioning and long duration of illness are all associated with poor long-term treatment outcomes (Franko et al., 2013; Papadopoulos et al., 2009). Clinicians and researchers alike agree that early intervention which takes a systemic approach and does not focus solely on physical health is imperative to improve prognosis (Franko et al., 2013; Nicholls & Yi, 2012). Due to greater neuroplasticity associated with adolescent brains, it is suggested that interventions in early adolescence offer the best chance of creating significant, long-lasting change, and therefore recovery from ED mental health problems (Blakemore, 2008; Goddings et al., 2012).

For young people with EDs, the best recommended intervention currently is Family Therapy (FT) (National Institute for Health and Care Excellence, 2020). Treatment focuses on empowering families to support their child's recovery, including enabling parents to take a lead at the beginning of treatment, before supporting their child to gain independence and make their own choices around food and exercise behaviours (National Institute for Health and Care Excellence, 2020). Patients normally receive 18-20 outpatient sessions over the course of a year, with regular reviews. An array of individual studies and systematic reviews have reported that young people have better long-term prognosis following FT, compared to individual therapy (Le Grange et al., 2015: Lock et al., 2010; Lock & Nicholls, 2020; Lock et al., 2021;

Watson & Bulik, 2013). Despite these positive results, many young people do not respond well to FT, and remission (and even hospitalisation) is not uncommon (Lock et al., 2006; Lock & Le Grange, 2019; Madden et al., 2015a; Madden et al., 2015b). It is therefore essential that the key mechanisms of change in FT are properly understood, in order to adapt treatment (Jewell et al., 2016). There is robust evidence that identified clinical indicators can predict change; for example, higher percentage median Body Mass Index (%mBMI) at the start of treatment predicts a good overall treatment outcome (Jewell et al., 2016). However, the evidence about how psycho-social factors can predict change is less clear (Hamadi & Holliday, 2020; Hamadi et al., 2020). One psycho-social factor which has been identified as predicting outcome is child and parent mentalisation (Jewell et al., 2021)*.

Mentalisation, also known as reflective functioning, is the ability to understand and reflect on internal states, both of ourselves and of others, and how our internal states motivate behaviour, particularly within social situations (Allen, Fonagy & Bateman, 2008; Fonagy et al., 1991). Mentalisation is an innate cognitive process that develops through childhood, closely linked to attachment (Fonagy et al., 1991). Mentalisation is often referred to as an umbrella term, encompassing ideas like Theory of Mind (ascribing mental states to others) and alexithymia (an inability to recognise and express one's emotions) (Happé, Cook & Bird, 2017; Lane et al., 2015). Mentalisation is integral to understanding unwritten social rules, making and maintaining relationships, and healthy emotion regulation (Schwarzer et al., 2021). Good mentalisation is understood to fit in between two extremes – neither a complete lack of/extremely limited understanding of internal states (hypo-mentalising); nor an excessive amount of certainty about them, that is often not grounded in reality (hyper-mentalising) (Luyten et al., 2020). Essentially, good mentalising means knowing that while one can have a good idea what other people are experiencing, one can never be completely certain. Good mentalisation requires an element of curiosity and openness to understanding others; it is intrinsically linked to empathy and mindfulness (Lehmann et al., 2022; Marszał & Górska, 2015; Török & Kéri, 2022). Mentalisation is a flexible skill, with people potentially oscillating between good and poor mentalisation depending on the situation and the people they are with (Bateman & Fonagy, 2019).

The ability to mentalise may act as an important protective factor against severe mental health problems - poor mentalisation has been associated with many different mental health problems, including EDs (Katznelson, 2014; Robinson, Skårderud & Sommerfeldt, 2017; Tasca, 2019). Research suggests that people with AN struggle to mentalise, in comparison to those without AN (Rothschild-Yakar et al., 2018; Rothschild-Yakar et al., 2010; Rothschild-Yakar et al., 2019). Mentalisation deficits may reinforce cognitive distortions, such as thought-shape fusion, which are key characteristics of EDs (Del Pozo et al., 2018); trials of

**There are multiple forms of FT for ED, however for the remainder of this chapter, the term Family Therapy and the abbreviation FT will refer to Family Therapy for Anorexia Nervosa (FT-AN) which is often referred to as the Maudsley Approach, as this is the approach used by the services surveyed in Jewell et al. (2021).*

Mentalisation-Based Treatment for ED have begun in adults, with preliminary results suggesting positive influence on ED cognitions (Robinson et al., 2016; Sonntag & Russell, 2022). While most research has been conducted on adults, one systematic review about mentalisation, attachment and EDs noted that adolescents with AN have more difficulty in recognising emotions, both in themselves and in others, and overall have reduced mentalisation, compared to adolescents without EDs (Jewell et al., 2016). For adolescents in hospital with AN, reduced mentalisation was associated with more emotional suppression and less cognitive reappraisal, restricting a person's ability to engage in therapy (Rothschild-Yakar et al., 2018). Poor mentalisation was associated with ED persistence and poor response to therapy compared with patients who had good mentalisation skills (Kuipers, van der Ark & Bekker, 2020). Poor mentalisation was also associated with lower levels of perception of social support by individuals with AN (Skårderud, 2007). If an adolescent struggles to identify the support available to them, this might be expected to impact the outcome of FT (Giles et al., 2022). Equally, has been established that, in adolescents with AN, lack of recognition of internal states is related to more severe ED symptomatology (Rothschild-Yakar et al., 2019). Together, these results suggest that, for individuals with AN, mentalisation may play a role in illness severity, therapeutic engagement, and theoretically response to therapy.

It is also important to consider the role of parents' ability to mentalise in an adolescent's recovery from an ED. An adolescent's ability to mentalise develops in the context of their attachment relationship; there is much evidence to suggest a strong relationship between a parent's ability to mentalise about themselves *and their child*, and their child's own ability to mentalise (Camoirano, 2017). Studies have suggested that poor parental mentalisation plays a role in children's mental health problems, including anxiety and impaired emotion regulation (Camoirano, 2017). Across the parenting literature, there is evidence that parent mentalisation can be changed through therapy and there is a positive impact on adolescents' clinical outcomes, such as a reduction in externalising behaviours and an improvement in attachment (Donnelly et al., 2023; Ordway et al., 2015; Sadler et al., 2013). However, none of these studies have examined parents of children with EDs. Despite the importance of parent-child relationships in ED recovery, research into the role of parental mentalisation is lacking: one study demonstrated that when parents are certain they understand their adolescent's mental states, this predicts poor ED treatment outcome in adolescents (Jewell et al., 2021). When these studies are considered together, one can hypothesise that improving parental mentalisation could be an important therapeutic target in ED treatment and should be an area for further research.

A neurodevelopmental disorder that has been associated with EDs and mentalisation deficits is autism. There is a plethora of evidence that adolescents with EDs, particularly AN, display

clinical and neuropsychological features similar to Autism Spectrum Disorders (ASD) (Baron-Cohen et al., 2013; Oldershaw et al., 2011; Rhind et al., 2014; Tchanturia et al., 2013; Westwood & Tchanturia, 2017). People with ASD show impaired mentalisation ability and score poorly on measures of mentalisation (Katznelson, 2014; Luyten et al., 2020). Many autistic people struggle with social communication, incorrectly reading and responding to social cues (Baron-Cohen, 2000); some argue that ASD is a "*neurodevelopmental disorder of mind-reading*" (Happé, 2015). There is little compelling evidence that social communication deficits can be changed on a long-term basis through psychosocial interventions (Green & Garg, 2018). There is also evidence that parents struggle to mentalise more about their child with ASD than their other children (Ansari, McMahon & Bernier, 2020). Much evidence has demonstrated that ASD traits, such as struggling with routine changes or social cognition, are overrepresented in the ED population (Westwood & Tchanturia, 2017) and it has been suggested that high levels of ASD traits may be involved in maintaining EDs (Baron-Cohen et al., 2013; Tchanturia et al., 2013). A meta-analysis demonstrated that characteristics related to ASD, including cognitive inflexibility and poor emotion recognition, were associated with longer duration of AN (Saure et al., 2020). Indeed, some have even suggested that AN should be considered a form of ASD (Brede et al., 2020; Gillberg, 1983; Oldershaw et al., 2011). However, there is evidence that suggest the similarities between the conditions are only heightened when a person is in the "illness" state of EDs (high levels of negative affect, recent rapid weight loss, etc.): women in recovery from AN showed near to normal emotion recognition and performed significantly better at mentalisation tasks than patients who were still in treatment (Oldershaw et al., 2010). Neuroimaging and neuropsychology studies also suggest that deficits found in ASD are not consistently observed in those with AN (Halls et al., 2022). One possibility is that ASD traits and mentalising ability describe the same construct through different lenses, and theoretical frameworks. Are measures of mentalisation simply measuring strength of traits along the autism spectrum or is mentalisation a broader construct open to wider environmental influence?

3.1.1 Current Study Rationale

Adolescence is a critical period for the development of mentalisation, as adolescents are under the influence of a range of pubertal hormones (Blakemore, 2008; Goddings et al., 2012). However, external factors can affect developmental processes, including acute or chronic starvation, a common problem amongst adolescents with restrictive EDs (Brockmeyer et al., 2012; Seitz, Herpertz-Dahlmann & Konrad, 2016). This makes it difficult to know whether deficits in mentalisation are due to disruption of normal development secondary to illness or a consequence of abnormal development - is it a predisposing trait, such as seen in ASD, or a consequence of starvation and strong ED cognitions, or a combination, with starvation

selectively impacting those with predisposing traits? (Dinkler et al., 2021; Katznelson, 2014; Oldershaw et al., 2010; Solmi et al., 2021).

Jewell and colleagues aimed to investigate the role of mentalisation in predicting FT treatment outcome by following a group of adolescents receiving FT and their families, over a period of nine months (Jewell et al., 2021). They found that excessive certainty about mental states in parents and adolescents predicted poor treatment outcomes. The higher a parent's score on the Reflective Functioning Questionnaire (Certainty Subscale) (Fonagy et al., 2016), the lower the likelihood of a good treatment outcome for their child at nine months (Jewell et al., 2021). Equally, higher scores on the Difficulties in Emotion Regulation Scale (DERS) Lack of Emotional Clarity Subscale, which indicates *uncertainty* about one's own mental states, was predictive of good treatment outcome (Jewell et al., 2021). The authors concluded that excessive certainty, considered poor mentalisation, may be associated with rigidity and difficulty understanding other people's perceptions. In turn, this can make it difficult for people to learn and utilise new coping strategies and social skills, impacting therapy. In contrast, feeling uncertain about mental states leaves people open to new suggestions for managing emotions and relationships, which can improve the effectiveness of therapy.

If certainty in mental states is negative for FT outcome, then one could speculate that changing mentalisation would positively impact FT outcome. There is some evidence to suggest that both adolescent (Rossouw & Fonagy, 2012; Sharp et al., 2013) and parent (Adkins, Luyten & Fonagy, 2018; Bammens, Adkins & Badger, 2015) mentalisation can change through therapeutic intervention, but few researchers have explored whether this is the case for adolescents with EDs and their parents. My analysis aimed to establish whether mentalisation changes through FT and whether this change would predict treatment outcome. There is evidence that child characteristics can impact on a parent's ability to mentalise about them; in particular, some parents find it harder to mentalise about their child who shows difficult behaviour, compared to other children (Ansari, McMahon & Bernier, 2020; Fishburn et al., 2017). Therefore, in addition to establishing how mentalisation changes through FT, I aimed to establish whether baseline adolescent characteristics could predict any change in mentalisation, specifically autistic traits and ED symptomatology. It is hoped that the results will shed light on how to identify families in most need of support improving mentalisation, at the start of treatment.

3.2 Aims and Hypotheses

Using the data collected by Jewell and colleagues (Jewell et al., 2021), I aimed to answer the following questions:

1. Do parent and adolescent mentalisation scores correlate in an ED population?

2. Does mentalisation, in both adolescents and parents, change over the course of ED treatment?
3. Do baseline child characteristics, including severity of the ED and level of autistic traits, predict any change in mentalisation during treatment?
4. Does the change in mentalisation, either adolescents' or parents', predict treatment outcome?

My hypotheses were:

1. There will be a positive correlation between parent mentalisation scores and adolescent mentalisation scores. Reflective Function Questionnaire (RFQ8) will correlate positively with Reflective Functioning Questionnaire for Youth (RFQ-Y); parent and adolescent Difficulties in Emotion Regulation Scale (DERS) Lack of Emotional Clarity Subscale will positively correlate.
2. Mentalisation will change through treatment for both adults and adolescents; there will be a positive change on RFQ8, RFQY and DERS Lack of Emotional Clarity Subscale (for both adults and adolescents).
3. At baseline, there will be a negative relationship between adolescent mentalisation and adolescent's level of autistic traits, and adolescent mentalisation and adolescent's severity of ED symptoms; Social Responsiveness Scale (SRS-2) score and Eating Disorder Examination Questionnaire (EDE-Q) score at baseline will predict how much RFQ8, RFQ-Y and DERS Lack of Emotional Clarity scores will change during FT.
4. Change in mentalisation (parent or adolescent) will predict treatment outcome; change on the RFQ8, RFQ-Y and DERS Lack of Emotional Clarity Subscale (for both parents and adolescents) will predict good treatment outcome using the Morgan-Russell Outcome Scale.

3.3 Methodology

3.3.1 Design

I conducted secondary analysis of data from a naturalistic study of patients and their families receiving FT for AN. The original study design was a longitudinal observational study, following adolescents through outpatient ED treatment and assessing what baseline variables predicted treatment outcome (Jewell et al., 2021). The study used online, self-report measures, with some information collected as part of routine clinical assessment (e.g. weight and height data); data was collected at five timepoints.

3.3.2 Participants

173 families were included for analysis. All adolescents were under 18 years old, with a diagnosis of AN or restrictive Other-Specified Eating Disorder. Each adolescent had at least one parent who had agreed to take part in the study. Families had to be receiving FT at an NHS community ED service in the UK. The inclusion criteria for adolescents were being aged between 10 and 17, living with their parents and/or carers for at least the previous three months, having an adequate level of English, and receiving outpatient FT-AN as their treatment. Parent/carer criteria were that they would be involved in attending FT-AN sessions and had an adequate level of English (Jewell et al., 2021).

3.3.3 Data Collection

Data was collected from three specialist outpatient ED services across England, by Jewell et al. (2021). Participants completed measures at five time points across nine months while receiving FT: baseline (start of treatment), one month, three months, six months and nine months. Data collection occurred between 2015 and 2018. For further information on the collection procedure and the intervention itself, see Jewell et al. (2021).

3.3.4 Outcome Measures

3.3.4.1 Adolescent Outcomes

Eating Disorder Examination Questionnaire (EDE-Q)

ED severity was measured using the Eating Disorder Examination Questionnaire (EDE-Q) (Fairburn & Beglin, 2008). This is a 28-item self-report measure of ED pathology over the past 28 days, for example, "*Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?".* Higher scores on the global scale indicate more problematic eating behaviours. It is used routinely in health services and research, with good internal consistency (Cronbach's α ranges from 0.70 to 0.93) and test-retest reliability (correlations for scores on the four subscales range from 0.66 to 0.94) (Berg et al., 2012). EDE-Q scores were taken from patient notes, as they are completed at initial treatment assessment.

Social Responsiveness Scale (SRS)

Social impairment severity was measured using the Social Responsiveness Scale (SRS) (Constantino & Gruber, 2012). This is a 65-item parent-report measure of social impairment associated with autism. The scale quantifies impairment severity: higher scores indicate more social impairment (Constantino & Gruber, 2012). The SRS exhibits high internal consistency (Cronbach's α = .91-.97), strong test-retest reliability over 3 weeks to 4 months (intraclass correlations = .84-.97) and good interrater reliability (between parents, r = .95) in clinical

samples (Bölte, Poustka & Constantino, 2008). Moreover, the SRS demonstrates good convergent validity, with significant positive correlations with established autism assessment tools, including the Autism Diagnostic Interview—Revised (ADI-R) (r = .38-.46) and the Social Communication Questionnaire (SCQ) (r = .58) (Bölte, Poustka & Constantino, 2008). SRS scores were taken from patient notes, as they are completed at initial treatment assessment. *The SRS score was not included in Dr Jewell's original research but provided for me by one of the clinical teams.* Note that SRS data was only available for 41 adolescents: to address missing data, an automated imputation process was conducted using the SPSS software. Specifically, the Fully Conditional Specification (FCS) method within SPSS was employed to manage missing values. This method generated a total of 10 imputations to enhance the completeness of the dataset. The imputation model for scale variables relied on Linear Regression. Noteworthy constraints were applied to define the roles of variables during the imputation process: Baseline EDEQ and %mBMI were both designated as predictors rather than dependent variables in the imputation procedure. The predictor variables were selected for their completeness at baseline and their established association with autistic traits in previous research. SRS Total score was specifically used as a dependent variable for imputation purposes. Iterative steps of the FCS method were set to 10, and a maximum limit of 100 parameters was established for the imputation model. This systematic approach ensured a comprehensive handling of missing data, enhancing the dataset's completeness for subsequent analyses. The imputed data exhibited notable consistency with the original non-imputed data, revealing parallel trends in the absence of significant relationships between adolescent's social impairment (SRS) and parental reflective functioning (RFQ8, DERS Lack of Emotional Clarity) akin to the findings observed in the non-imputed dataset. Moreover, the significant association detected between EDE-Q and SRS remained consistent in both datasets, affirming the robustness of this relationship across analyses.

Reflective Functioning Questionnaire for Youth (RFQ-Y)

Mentalisation ability was measured using the Reflective Functioning Questionnaire for Youth (RFQ-Y) (Ha et al., 2013; Sharp et al., 2009). This is a 46-item self-report measuring mentalisation, with a 6-point Likert scale from strongly disagree to strongly agree. For example, "*In an argument, I keep the other person's point of view in mind*". Higher scores represent greater ability for mentalisation. RFQ-Y has shown good internal consistency (Cronbach α = .71; Ha et al., 2013) and good criterion validity in clinical samples (for example, when correlated with Borderline Personality Features Scale for Children, r_s = .552; (Lund et al., 2022)). RFQ-Y data was collected at the five study time points.

Difficulties in Emotion Regulation Scale (DERS) – Lack of Emotional Clarity Subscale

Alexithymia, an aspect of self-mentalisation, was measured with the Lack of Emotional Clarity Subscale of the Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004). The DERS is a 36-item self-report measure assessing problems with emotion regulation, with high internal consistency (Cronbach's α = .82-.95) (Hallion et al., 2018) and good reliability in adolescent populations (Cronbach's α = .72-.87) (Neumann et al., 2010). The Lack of Emotional Clarity Subscale measures how much an individual knows and is clear about their emotions, with high scores indicating lack of understanding about emotions (Gratz & Roemer, 2004). Lack of Emotional Clarity was collected at the five study time points.

3.3.4.2 Other Adolescent Outcome Measures

Patient %mBMI was collected at baseline and at the end of 9 months.

The Morgan-Russell Outcome Assessment Schedule (Russell et al., 1987) was used to assess treatment outcome at the end of treatment. This scale is categorical, with outcomes grouped here as Poor and Good. The assessment includes %mBMI, menstruation status and frequency of bulimic symptoms. A Good outcome indicates weight above 85%mBMI, normal menstruation and no bulimic symptoms; a Poor outcome indicates weight below 85%mBMI, no menstruation and evidence of frequent bulimic symptoms.

3.3.4.3 Parent Measures

Reflective Functioning Questionnaire (RFQ8)

Mentalisation ability was measured using the Reflective Functioning Questionnaire (RFQ8) (Fonagy et al., 2016). This is an 8-item scale that yields two subscales, used in conjunction with one another: Certainty about Mental States and Uncertainty about Mental States. Extreme scores at either end of the 7-point Likert Scales indicate poor mentalising. RFQ8 data was collected at the five study time points. Questions include, "*I always know what I feel*" and "*People's thoughts are a mystery to me*". The RFQ8 shows acceptable internal consistency for both subscales (Uncertainty Cronbach's α = .77 and Certainty Cronbach's α =.65) and has great test-retest reliability over 3 weeks (r_s = .84 for Uncertainty, r_s = .75 for Certainty) (Fonagy et al., 2016).

Difficulties in Emotion Regulation Scale (DERS) – Lack of Emotional Clarity Subscale

See above for description of the DERS and the Lack of Emotional Clarity Subscale. Lack of Emotional Clarity data was collected at the five study time points.

3.3.5 Ethical Issues

While there are no ethical implications with secondary data analysis, the original study was given ethical approval by Camden and King's Cross ethics committee of the Health Research Authority. All data shared with me was anonymous and held on a password-protected Imperial College London server.

3.3.6 Data Analysis

Descriptive statistics were published in Jewell et al. (2021) but have been included here for context. SRS data has NOT been published elsewhere.

Data was analysed using IBM SPSS Statistics version 28. For correlational analysis at baseline, the variable combinations are:

1. RFQ8 Certainty, RFQ8 Uncertainty and RFQY
2. DERS Lack of Emotional Clarity (parent and adolescent)
3. DERS Lack of Emotional Clarity (both), RFQ8 and RFQY
4. EDE-Q, RFQ8 (both), RFQY and DERS Lack of Emotional Clarity (both)
5. SRS, RFQ8 (both), RFQY and DERS Lack of Emotional Clarity (both)
6. SRS and EDEQ

Combinations 1 to 4 have recently been published in Jewell et al.'s (2021) paper, as supplementary information. However, they were not fully discussed or explored in the text of the paper, therefore I have included them here for further discussion.

A repeated measures approach was used to assess mentalisation change over time using RFQ8 (both subscales), RFQY and DERS Lack of Emotional Clarity (adults and adolescents). Initial t-tests were conducted between baseline and final data collection point (nine months).

It was hypothesised that adolescent's social impairment and adolescent's ED severity would predict change in parent and/or child mentalisation during treatment. For this analysis, the dependent variables are Change in RFQY, Change in RFQ8 Certainty, Change in RFQ8 Uncertainty, Change in DERS Lack of Emotional Clarity (parents) and Change in DERS Lack of Emotional Clarity (adolescents). Predictor variables were baseline variables SRS, EDE-Q, and %mBMI.

To assess whether change in parental mentalisation predicted treatment outcome, logistic regression was used. The dependent variable used was Morgan Russell Outcome, where the categories of outcome are Good or Poor. The predictor variables were Change in RFQY, Change in RFQ8 (Certainty and Uncertainty), Change in DERS Lack of Emotional Clarity (parents) and Change in DERS Lack of Emotional Clarity (adolescents).

3.4 Results

3.4.1 Descriptive Statistics

173 adolescents and their parents were included in the analysis. 88.4% of adolescents were female and 79.8% were white British. Adolescents with a diagnosis of AN (restricting subtype) made up 80.9% of the sample, with AN (binge-purge subtype) making up 5.2% and Other Specified Feeding or Eating Disorder making up the final 13.9% (Jewell et al., 2021). The mean age of the sample was 14.7 years old (S.D. = 1.54); the mean %mBMI was 83.9 (S.D. = 8.97) (Jewell et al., 2021). The majority of parent participants who took part were mothers (86%). *For a full overview of the demographics of the sample, see Jewell et al., 2021*.

Descriptive data for the baseline measures used in my analysis are displayed in Table 3.1. At baseline, adolescents exhibited moderate severity (mean = 3.35) on the EDE-Q (high severity is indicated by scores of above 4 (Fairburn & Beglin, 2008)) and low levels of social impairment (53.93) (SRS scores above 75 are considered a severe impairment, strongly associated with autism (Constantino & Gruber, 2012)).

Table 3.1. Range, means and standard deviations of the baseline measures. *These were previously published in Jewell et al., 2021, except for SRS.*

	N	Mean	Std. Deviation	Minimum	Maximum
Adolescents					
SRS Total Score	117	53.5	11.5	39	90
EDEQ Global Score	159	3.35	1.56	0.0	5.70
Adolescent DERS Lack of Emotional Clarity	170	14.6	4.98	5	25
RFQY Total Score	170	8.78	0.79	6.26	10.4
Parents					
RFQ8 Certainty Score	163	1.22	0.74	0.0	3.0
RFQ8 Uncertainty Score	163	0.41	0.45	0.0	2.17
Parent DERS Lack of Emotional Clarity	163	8.79	2.92	5	20

SRS-2 Social Responsiveness Scale-2; *EDE-Q* Eating Disorder Examination Questionnaire; *DERS Lack of Emotional Clarity* Difficulties in Emotion Regulation Lack of Emotional Clarity; *RFQY* Reflective Function Questionnaire – Youth Total Score; *RFQ8* Reflective Function Questionnaire (8-item version); *RFQ8 Certainty* RFQ8 Certainty About Mental States; *RFQ8 Uncertainty* RFQ8 Uncertainty About Mental States.

Table 3.2 shows the trend of change for parent and adolescent mentalisation across the five data points. The sample size greatly decreases through the study, with just over half the original adult sample (163 vs 88) and less than half the original adolescent sample (170 vs 81) still completing questionnaires at nine months. At baseline, of the adolescent variables, only SRS Total Score was normally distributed (Shapiro Wilk $p > .05$). At nine months, RFQ-Y and DERS Lack of Clarity were also not normally distributed (Shapiro Wilk $p < .05$). At baseline, none of the parent variables (RFQ8 and DERS Lack of Clarity) were normally distributed (Shapiro Wilk $p < .05$); at nine months, RFQ8 Uncertainty and DERS Lack of Clarity were not normally distributed (Shapiro Wilk $p < .05$), although RFQ8 Certainty was normally distributed (Shapiro Wilk $p > .05$).

Table 3.2. Mean score on adolescent and parent measures over the course of the study (baseline to 9 months), including DERS Lack of Clarity, Reflective Functioning Questionnaire and Reflective Functioning Questionnaire for Youth. The table also shows mean change and effect size.

	Baseline **(n = 170)**	One Month **(n = 126)**	Three Month **(n = 95)**	Six Month **(n = 36)**	Nine Month **(n = 81)**	**Mean Difference (Cohen's d)**
Adolescents						
DERS Lack of Clarity	14.6	14.9	13.6	13.8	13.1	-1.87 (.351)
RFQY	8.78	8.85	8.87	8.99	8.91	.009 (.011)
Parents						
DERS Lack of Clarity	8.79	8.91	8.43	8.52	7.83	.705 (.313)
RFQ8 Certainty	1.22	1.17	1.25	1.46	1.47	-.283 (.374)
RFQ8 Uncertainty	0.41	0.40	0.36	0.30	0.27	.099 (.305)

3.4.2 Correlational Analysis

Pearson's correlation was used to assess the relationships between the baseline measures.

3.4.2.1 Eating Disorder Severity and Mentalisation

These correlations have recently been published in the supplementary materials of Jewell et al. (2021).

I hypothesised that higher ED severity in adolescents would be associated with poorer mentalisation in both parents and adolescents. There was a weak but significant correlation between EDE-Q and adolescents' DERS Lack of Emotional Clarity ($r(156) = .235$, $p<.003$) (Jewell et al., 2021). However, there was no relationship between EDE-Q and RFQY, RFQ8 (either subscale) or parent's DERS Lack of Emotional Clarity (Jewell et al., 2021).

3.4.2.2 Social Impairment, Eating Disorder Severity and Mentalisation

It was hypothesised that higher levels of social impairment in adolescents would be associated with poorer mentalisation in both parents and adolescents. The analysis did not support this hypothesis: there was no significant relationship between adolescent's SRS score and parent's RFQ8 scores (Certainty: $r(110) = -.118$, $p=.348$; Uncertainty: $r(110) = -.043$, $p=.717$) or between adolescent's SRS score and parents' DERS Lack of Emotional Clarity score ($r(110) = .056$, $p=.723$). For adolescents, there was no significant relationship between SRS and RFQ-Y ($r(117) = -.184$, $p=.322$) or between SRS and DERS Lack of Emotional Clarity ($r(116) = .126$, $p<.316$).

However, there was a significant, moderate relationship between EDE-Q and SRS ($r(117) = .261$, $p<.05$), suggesting that higher levels of social impairment are associated with higher eating disorder severity in adolescents (see Figure 3.1).

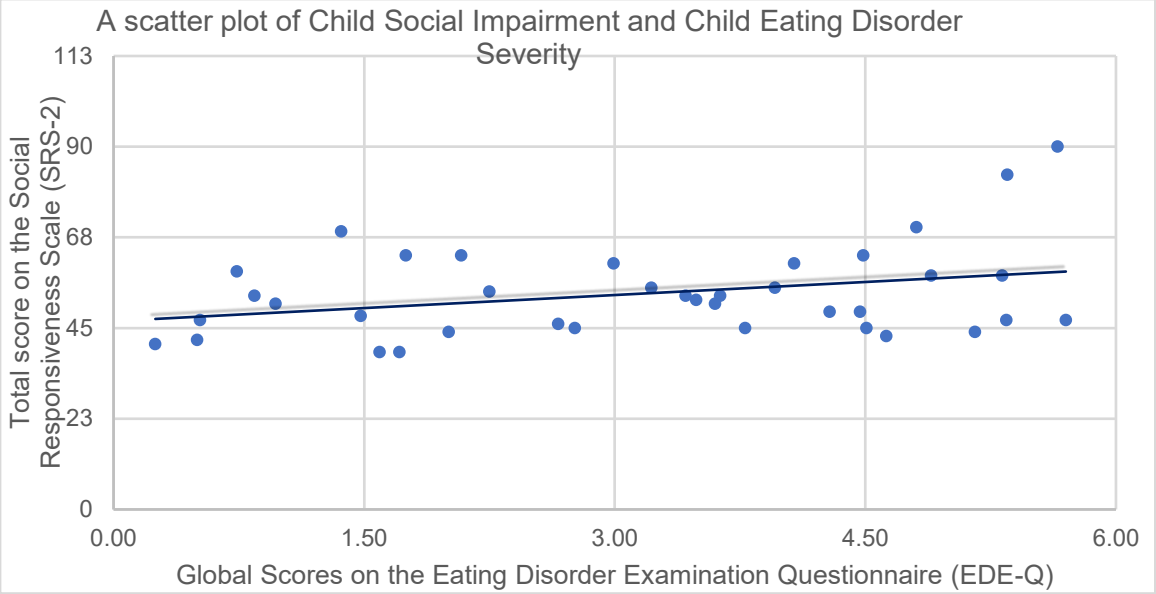

Figure 3.1. A scatter plot showing the significant association between total score on the Social Responsiveness Scale and global score on the Eating Disorder Examination Questionnaire.

3.4.2.3 Mentalisation Scales

These correlations have recently been published in the supplementary materials of Jewell et al. (2021).

It was hypothesised that there would be a significant, positive relationship between parent mentalisation and adolescent mentalisation. The analysis partially supported this hypothesis: there was a significant correlation between adolescent and parent DERS Lack of Emotional Clarity ($r(160) = .204$, $p=.01$). There was also a significant correlation between RFQ8 Certainty subscale and adolescent DERS Lack of Emotional Clarity ($r(160) =-.282$, $p<.001$) (Jewell et al., 2021).

However, there was no association between RFQ-Y and either RFQ8 subscale (Certainty: $r(160) = .026$, $p=.745$; Uncertainty: $r(160) = -.053$, $p=.506$), and there was no association between RFQ8 Uncertainty and adolescent DERS Lack of Emotional Clarity ($r(160) = .144$, $p=.069$). There was also no significant correlation between RFQ-Y and parent DERS Lack of Emotional Clarity ($r(160) = .020$, $p=.804$) (Jewell et al., 2021).

There were significant correlations between parent DERS Lack of Emotional Clarity and both baseline RFQ8 subscales (Certainty: $r(163) = -.466$, $p<.001$; Uncertainty: $r(163) = .370$, $p<.001$). There was a significant relationship between adolescent DERS Lack of Emotional Clarity and RFQ-Y ($r(170) = -.225$, $p<.003$) (Jewell et al., 2021).

3.4.3 Change in Mentalisation

It was hypothesised that there would be a significant change in mentalisation from baseline to nine months, in both adolescents and parents. This hypothesis was partially supported.

3.4.3.1 Parent Mentalisation

RFQ8 Certainty scores increased significantly ($t(86) = -3.485$, $p<.001$, Cohen's $d = -.374$), while RFQ8 Uncertainty scores decreased significantly ($t(87) = 2.862$, $p<.003$, Cohen's $d = .305$). There was also significant change in parental DERS Lack of Emotional Clarity, with parents becoming more certain about their emotions ($t(87) = 2.938$, $p<.002$, Cohen's $d = .313$).

3.4.3.2 Adolescent Mentalisation

RFQ-Y did not change ($t(78) = -.096$, $p=.462$). However, there was a significant decrease in DERS Lack of Emotional Clarity score for adolescents ($t(78) = 3.116$, $p<.001$, Cohen's $d = 3.51$).

3.4.4 Predicting Change

While one of the independent variables, baseline EDEQ, showed deviation from normality in its distribution, %mBMI and SRS total exhibited normal distribution (Shapiro Wilk, $p > .05$). Additionally, the dependent variables, change in mentalisation (Change in DERS Lack of Clarity for adults and children, and Change in RFQ8), demonstrated a normal distribution. This distribution variation prompts careful consideration for analysis and result interpretation but does not invalidate the use of linear regression analyses to explore the relationships between variables.

3.4.4.1 Predicting Change in Parent Mentalisation

For the Certainty subscale, the Uncertainty subscale and the DERS Lack of Emotional Clarity subscale, none of the hypothesised predictor variables significantly predicted change in parent mentalisation. See tables displayed in Appendix 2 which illustrate the regression models conducted for the change in parent mentalisation variables at different imputation steps, revealing the relationship between each dependent variable and the predictor variables.

3.4.4.1 Predicting Adolescent Mentalisation Change

For the DERS Lack of Emotional Clarity subscale, none of the predictor variables significantly predicted change in adolescent emotional clarity. See table displayed in Appendix 3 which illustrate the regression models conducted for change in adolescent emotional clarity at different imputation steps, revealing the relationship between the dependent variable and the predictor variables.

3.4.4.2 Predicting Treatment Outcome

The analysis showed that change in mentalisation (RFQ8 or DERS Lack of Emotional Clarity) did not predict treatment outcome ($\chi^2(4) = 3.356$, $p = .500$).

3.5 Discussion

My analysis aimed to investigate whether mentalisation changes through FT, and whether change predicts treatment outcome at 9 months. My hypotheses were partially supported: some aspects of mentalisation do change for parents and for adolescents. Parents become more certain about mental states, including their own emotions, while adolescents become clearer about their own emotions, but their overall scores for mentalisation did not change. However, change in mentalisation did not predict treatment outcome, suggesting that parent mentalisation may not be the essential mechanism of change in FT. Additionally, I hypothesised that baseline factors would predict how much mentalisation changes through FT. Social impairment and ED severity did not predict change in mentalisation on the whole, although it is likely that the linear regressions were underpowered due to only having 23 adolescents with complete data sets, so caution should be taken with this conclusion.

3.5.1 Certainty Increases

I hypothesised that mentalisation would improve through treatment. On the RFQ8, this would equate to an increase on the Uncertainty subscale and a decrease on the Certainty subscale (as 0 on both scales indicates good mentalisation (Fonagy et al., 2016)). However, of the 87 participants who completed questionnaires at baseline and at nine months, only 27 parents showed a decrease in their certainty about mental states, while 8 parents showed no change. Jewell et al. showed that high certainty predicted poor treatment outcome; certainty is conceptualised negatively in this context (Jewell et al., 2021). It was theorised that excessive certainty might obstruct treatment because parents may be set in their thoughts and so unable to incorporate new skills or ideas being taught in therapy being offered, resulting in a struggle to problem solve effectively (Jewell et al., 2021). If this theory is true, the fact that certainty increases through therapy should be considered a bad thing. However, with only 31 out of 173 families receiving a “Poor” treatment outcome, and the fact that change in mentalisation did not predict outcome, the findings from my analysis do not fit with this theory. Through conversations with clinicians and with academics, I posit a related theory: at the start of treatment, high certainty reflects inflexibility and inability to engage with therapy. However, because ED treatment is so intensive and life-altering, for parents who start therapy *uncertain* about mental states, there is a need for them to become more certain and confident in their skill set, and in their ability to survive the process effectively. Anecdotally, many parents report that when they start FT, it feels overwhelming and confusing, and they will grasp onto any sense of normality or certainty. Perhaps by the time FT comes to an end, certainty - initially considered a negative trait - would correlate with confidence in their parenting skills.

For the DERS Lack of Emotional Clarity subscale, Jewell et al. demonstrated that higher scores, which suggest a lack of understanding of one's emotions, predicted good treatment outcome (Jewell et al., 2021); this was the opposite direction to their hypothesis. Input from a PPI consultation suggested that certainty about your own feelings might be a result of identifying with the voice of the ED, and being less certain about your feelings may encourage you to use therapy and support effectively (Jewell et al., 2021). Given this, I hypothesised that participants would become less certain about their feelings through treatment. This, however, was not what my analysis found: parents and adolescents alike became more certain about their feelings through treatment. As with the RFQ8, these results suggest that although uncertainty about mental states at the beginning of treatment is important for outcome, certainty by the end of treatment may also be important, fitting with my theory that, for parents, certainty about mental states would correlate with confidence.

3.5.2 No Change for Overall Adolescent Mentalisation?

As with parent mentalisation, I hypothesised that mentalisation would change for adolescent participants. This was the case for DERS Lack of Emotional Clarity, with adolescents becoming more certain about their emotions. However, this was *not* the case for the RFQ-Y: between baseline and nine months, there was a tiny mean change of .13, with participants demonstrating moderate to good levels of mentalisation on average. Examining the moderate scores consistently observed prompts a critical evaluation of the RFQ-Y's capacity to comprehensively capture the intricacies of mentalisation within this specific demographic and treatment framework. The lack of observed change raises two possible considerations: either an overall plateau in mentalisation despite therapy, or limitations within the RFQ-Y itself, potentially unable to detect nuanced variations within this particular population or treatment context. Context and interpretation play pivotal roles here. While the initial lack of change may raise concerns, acknowledging a consistently good baseline in mentalisation levels throughout the treatment period is a positive indication. This stability could imply that certain dimensions of mentalisation remain resilient or unaltered by the intervention. However, the discrepancies seen in significant changes in emotional clarity challenge the notion of stability in mentalisation during FT, emphasizing the necessity for a more nuanced understanding of the specific aspects of mentalisation that the RFQ-Y measures. The RFQ-Y, designed to encompass multiple facets of mentalisation, might lack sensitivity to detect subtle changes in specific dimensions of mentalising. Its broad approach might obscure nuanced shifts, such as those related to emotional clarity versus understanding others' mental states. Consequently, this limited sensitivity might mask changes, leading to an apparent lack of overall change despite subtle shifts in specific aspects of mentalisation. It's plausible that FT impacts certain facets

of mentalisation while leaving others relatively unaffected. This selective influence might explain the lack of observed change when mentalisation is collectively assessed.

Looking ahead, the implications for future research are considerable. The necessity for a meticulous re-examination and refinement of the RFQ-Y, particularly in assessing changes among adolescents undergoing ED treatment, is apparent. The current scarcity of studies focusing on the RFQ-Y's sensitivity to change underscores the urgent need for further exploration and refinement to better comprehend shifts in mentalisation during therapeutic interventions. Further investigation may involve scrutinizing individual trajectories to uncover potential subgroup changes not reflected in the overall mean scores. Complementary measures or qualitative data exploration could illuminate the nuances of mentalisation changes among adolescents undergoing FT.

3.5.3 Predicting Treatment Outcome

Based on Jewell et al.'s results, which suggested outcome was predicted by aspects of mentalisation (Jewell et al., 2021), I hypothesised that changes in parent and adolescent mentalisation would predict treatment outcome. This would then suggest that mentalisation is, or aspects of it are, a potential treatment target during family therapy. My analysis did not support this hypothesis – although there was, on average, a change in parent overall mentalisation and in adolescent and parent alexithymia, these changes did not predict treatment outcome. There are several potential reasons for this. Firstly, data was analysed by creating change variables, which was the difference between scores at baseline and nine months. This was a continuous variable, which accounted for the amount of change that occurred, rather than a categorical variable of Change vs No Change. Using a categorical variable or using a technique such as structural equation modelling to create a latent variable may shed more light on the relationships between variables.

Secondly, while aspects of mentalisation might predict treatment outcome, mentalisation may not be the essential mechanism of change, or at least not directly. Jewell et al.'s paper reported on a large number of variables, including emotion regulation, therapeutic alliance, and attachment (Jewell et al., 2021). It is possible that another variable is a candidate for therapeutic change, and mentalisation plays a smaller part. Indeed, Jewell et al. noted that good therapeutic alliance was predictive of good treatment outcome, and alliance was predicted by child mentalisation (Jewell et al., 2021). It may be that although changing mentalisation is not fundamental for outcome, it is important in supporting other factors to change. Future analysis should focus on establishing the interactions between these variables, through mediation analysis.

There is a final possibility. With analysis focused on average changes across the sample, it is possible that for *some* groups of parents, change in mentalisation is important for treatment outcome. Dr Cathy Troupp, a child psychotherapist, demonstrated that parents of children with EDs fall into two self-described camps: those who prioritise mentalising about their children, and those who feel that the ED is unrelated to family factors (Troupp, 2020). This would suggest that changing mentalisation may be important for treatment for one group of parents, but not for another. When this research is combined with those suggesting that mentalisation is key to incorporating new approaches and utilising therapeutic skills (Bateman & Fonagy, 2019; Lüdemann, Rabung & Andreas, 2021), an argument begins to build that future analysis should focus on identifying groups of parents and children where mentalisation change is important.

3.5.4 Understanding Correlations

Mentalisation develops in the context of attachment relationships, so if a parent has poor mentalisation, a child might be expected to have poor mentalisation skills. I hypothesised that parent mentalisation scores would positively correlate with the mentalisation scores of their child. This was not the case for the RFQ8 and RFQY measures, but it was for parent and child DERS Lack of Emotional Clarity. This suggests that if parents are good at mentalising about themselves, their children will also be good at this. What this relationship means in terms of treatment outcome remains to be explored. With regards to the very weak and non-significant relationship between RFQ8 and RFQ-Y, there are number of avenues to explore to further understand why this hypothesis was not met. For example, while one may expect a degree of correlation between the measures given their common theoretical roots and conceptual foundations, and the fact that they were devised by the same research groups, the RFQ-Y and the RFQ8 are distinct instruments tailored for different age groups Ha et al., 2013; Sharp et al., 2009; Fonagy et al., 2016). The lack of correlation may be attributed to differences in the formulation of questions within each instrument. For instance, the RFQ-Y features items tailored to resonate with an adolescent's social experiences, using language and scenarios that mirror their peer interactions and self-reflection. Conversely, the RFQ8, developed for assessing adult reflective functioning within attachment contexts, incorporates scenarios relevant to diverse adult relationships beyond just parenting. These dissimilarities in question formulation, designed to align with the cognitive and emotional realms of adolescents and adults, respectively, might contribute to the observed lack of correlation between the scales. Additionally, while both scales aim to measure mentalisation in a similar way, nuances in completion may illuminate differing perspectives. Adolescents may focus more on social interactions with peers and siblings, while parents were asked to consider their child's emotional needs and were completed at a time when parents were expected to be focusing

on their child's wellbeing. These divergent focal points – adolescents on social interactions and parents on their child's emotional landscape – could contribute to the observed discrepancies between the assessments. Variances in who participants envisioned while completing the questionnaires likely influenced the facets of mentalisation emphasized, potentially accounting for the lack of direct correlation between the scales. Further qualitative work could shed light on to this theory.

There were significant positive correlations between social impairment and ED severity, as well as ED severity and lack of clarity about one's emotions, both of which support previous findings that people with EDs struggle with alexithymia and there are high rates of ASD diagnosis amongst this community (Baron-Cohen et al., 2013; Tchanturia et al., 2013; Westwood & Tchanturia, 2017). However, there was no correlation between ED severity and overall mentalisation. This suggests that the RFQ-Y measure may not be sensitive enough to pick up on specific problems with mentalisation in this population, such as alexithymia.

Despite literature suggesting that mentalisation could be considered an autistic trait (Green & Garg, 2018; Happé, 2015), there was no relationship between either the RFQ-Y or the adolescent's DERS Lack of Emotional Clarity and SRS. This suggests that mentalisation may not be a specific autistic trait, which some have posited previously (Baron-Cohen, Leslie & Frith, 1985; Baron-Cohen, 2000). The fact that aspects of mentalisation did change in this study also suggests that mentalisation is a malleable skill, unlike more concrete autistic traits.

My analysis also found significant, albeit weak correlations, between the DERS Lack of Emotional Clarity subscales and the reflective functioning scales (both RFQ8 subscales and the RFQ-Y), which supports the concept that alexithymia can be understood as an important aspect of mentalisation (i.e. understanding and reflecting about one's own mental states). It also suggests that the DERS Lack of Emotional Clarity subscale should be considered a mentalisation measure.

3.5.5 Limitations

There are several limitations to consider. Firstly, RFQ8 is not a measure of parent mentalisation, but of general mentalisation. Parents were not asked to mentalise specifically about their child. Mentalisation is flexible and relationship dependent – parents may mentalise differently about different children (Ansari, McMahon & Bernier, 2020). Using a more specific, parent-focused mentalisation scale could shed more light onto the importance of changing parent mentalisation in ED treatment. Additionally, RFQ-Y is a tool that measures a variety of different aspects of mentalisation and gives an overall score. This means that it is possible that we cannot assess how individual areas of mentalisation changed. The significant change in child DERS Lack of Emotional Clarity suggests that mentalising about oneself can change;

it is likely that the RFQ-Y is merely not sensitive enough to pick up on changes in this patient population.

The presence of non-normally distributed variables in our study necessitates careful interpretation, given their potential to influence perceived relationships between variables. Despite extensive research suggesting a correlation between autistic traits and alexithymia (Fatima & Babu, 2023; Kinnaird et al., 2019), the findings revealed a non-significant relationship between SRS and both RFQY and adolescent DERS Lack of Emotional Clarity. This discrepancy challenges the conventional understanding, underscoring how non-normally distributed variables might obscure expected associations. It's crucial to acknowledge that when variables deviate from normal distribution, the observed links might not be absent, but rather the relationships between variables could manifest in a different distribution pattern, highlighting the limitations in assessing their true associations.

While the original sample size was adequate for a longitudinal study, by the end of data collection, the sample had dropped by nearly 50%. Attrition rates are high in ED research, particularly when examining AN (DeJong, Broadbent & Schmidt, 2012), and it is expected in longitudinal studies to experience participant loss at follow-up (Saiepour et al., 2019). There are a number of reasons that may be true for the participant drop out in this study, including that many families do not stay in family therapy for as long as nine months and may have been discharged. Equally, the fact that data was collected at 5 different time points means that families may have felt the study requirements were too burdensome. Whatever the reason, it is important to acknowledge the reduction in participant numbers by the end of the study, as it reduces the generalisability of the findings.

3.5.6 Conclusion

This is the first study to look at mentalisation change in parents of adolescents with EDs, and how mentalisation change predicts treatment outcome. It is also one of the first to study whether baseline factors predict change in mentalisation in adolescents and parents. We established that while many aspects of mentalisation do change, change does not predict treatment outcome. We established that baseline measures such as adolescent social impairment and ED severity did not predict how much mentalisation would change. Future analysis will focus on exploring what effect mentalisation change has on other psychosocial factors that might predict treatment outcome and establish whether encouraging change in mentalisation is an important treatment target.

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Chapter 4: Impact of Group Parenting Interventions on Parental Reflective Functioning and Children's Social Outcomes

The following chapter presents a summary of research that is in the process of being published.

Statement of Authorship

PPS and I conceived the systematic review; PPS and YZ ran the searches; study eligibility was assessed by myself, PPS and YZ; PPS assessed risk of bias; YZ ran the statistical analysis; the manuscript was written by myself and PPS, with comments provided by YZ.

4.1. Introduction

Parent mentalisation is important for sensitive parenting and for children's development of mentalisation. Many attempts have been made to improve parent mentalisation, particularly for parents who may be at risk of failing to attach with their child, with notable success: the majority of the studies that have examined mentalisation-based clinical interventions have demonstrated that parental mentalisation can be changed and this change is related to better quality care and psychosocial outcomes for children (Aldrich, Chen & Alfieri, 2021; Barlow, Sleed & Midgley, 2021; Camoirano, 2017; Zeegers et al., 2017). Group intervention is a promising approach in clinical settings as it can be more cost-effective and less time-consuming than individual intervention, and the group setting provides the opportunity to benefit from social interactions with other parents (McRoberts, Burlingame & Hoag, 1998; Rosendahl et al., 2021; Slone et al., 2015). There are several studies that have examined how group interventions can improve parental mentalisation, but to date, there has not been a systematic overview of the efficacy of these interventions. The aim of this meta-analysis and systematic review was to assess whether group interventions are effective at improving parent mentalisation and what this improvement means for children's social outcomes, including attachment security. By understanding the effectiveness of group interventions at improving parent mentalisation, it is possible to identify ways to more effectively support parents in providing nurturing and supportive environments for their children.

4.2. Methodology

To be eligible for inclusion, studies had to be published in peer-reviewed journals in English, Spanish, or Italian. The search was limited to *group* parenting interventions that quantitatively

measured parent mentalisation using tools such as the Parental Reflective Function Questionnaire (PRFQ) (Luyten et al., 2017), the Parent Development Interview (PDI) (Slade et al., 2004; Slade et al., 2004), and the Pregnancy Interview (PI) (Slade et al., 2004), among others. Parenting groups for children under the age of 18 were included; dissertations and meta-analyses were excluded. The search was conducted on 12 July 2022, by researchers PPS and YZ, using EMBASE, Medline and PsycInfo databases. Keywords included "parenting", "group intervention" and "parental reflective functioning". Full-text screening was conducted by PPS, YZ and myself, with full agreement needed for the study to be included.

The following information was extracted from the eligible studies: publication details (author and year), study design (randomised or non-randomised), participant characteristics (population, sample size, parents' age, and children's age), intervention details (treatment group, comparison group, and duration), outcomes (mentalisation measurement tool and timing of data extraction), and results (pre- and post-intervention PRF mean values, children's outcomes, standard deviations, and effect sizes).

Information about children's social outcomes was also collected, to be included in the systematic review. This included data-collection point, social outcome measure name, mean and standard deviation of the measure pre-intervention and post-intervention, sample size and age of child. There were multiple measures that were considered to be measuring social outcomes: the CARE-index (Blehar, Lieberman & Ainsworth, 1977), Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1999) (Peer Relationships, Prosocial Behaviour and Internalising subscales), the Coding Interactive Behaviour measure (Feldman, 1998) (Dyadic Atunement and Child Involvement subscales), the Aberrant Behaviour Checklist (ABC) (Aman & Singh, 1986) (Lethargy/Social Withdrawal subscale), Emotional Availability scale (EA) (Biringen et al., 2014) (an overall parent-child interaction score), Child Behaviour Checklist (CBCL), Social Skills Rating System (SSRS) (Gresham & Elliott, 1990), Child Mind-mindedness (Meins & Fernyhough, 2006), and Strange Situation Paradigm (SSP) (Ainsworth et al., 2015) (measuring change in attachment category).

To calculate the effect sizes (Hedge's g (Hedges, 1981)) for the meta-analysis, sample sizes, means, standard deviations, and standard errors of the mentalisation measure(s) were extracted for the experimental and control groups. When papers did not provide adequate information for the analysis, the corresponding authors were contacted by PPS to request the relevant information. Single effect sizes were calculated for the studies that reported parent mentalisation outcomes with more than one measurement (i.e. if they used a questionnaire and an interview), so that each study provides only one effect size. For the PRFQ, a decrease in pre-mentalising score indicates positive change (Luyten et al., 2017), the signs of the effect sizes were reversed before calculating the nested and pooled effect sizes. A random effects

model was implemented for calculation of the pooled effect size, because of the varying demographic characteristics and interventions and measurements used in each study. Q and I^2 were used to calculate heterogeneity of the studies (where Q-test indicates the presence of heterogeneity and I^2 represents the percentage of total variance between the studies caused by heterogeneity in effect sizes) (Higgins & Thompson, 2002). All the analysis was conducted in R Version 3.6.1 using the *meta* package, by researcher YZ.

The Cochrane Handbook's guidelines were followed to critically appraise records in this review, using the ROBINS-I tool for non-randomised studies (Sterne et al., 2016) and the NHLBI tool for randomised controlled studies (National Heart, Lung, and Blood Institute (NHLBI), 2021). Both tools consisted of questions to evaluate the internal validity of the studies, with possible answers of Yes/No/Not reported. The studies were rated for overall quality based on criteria such as appropriateness of study design, choice of outcome measure, quality of reporting, quality of the intervention, and general risk of bias.

4.3. Results

498 references were obtained and uploaded onto Covidence for de-duplication. Among these, 465 studies were screened based on their title and abstract, resulting in the exclusion of 378 studies. Following a full-text review of 87 records, 16 studies were found to meet the criteria. During the screening process, one study that was not identified in the original search was found through a previously included record, and included in the review as the study met inclusion criteria. In total, 16 records were critically appraised for the meta-analysis. Of these 16 studies, 7 studies were included for the systematic review (see Figure 4.1).

A full list of the studies included in the meta-analysis and their study characteristics are displayed in Table 4.1, while those that were additionally included in the systematic review are shown in Table 4.2. The majority of studies were non-randomised studies, and all except five studied at-risk families struggling with caregiving due to biopsychosocial factors like mental health problems or poor living conditions. Sample size ranged from 14 to 163 child-parent dyads. Children ranged from prenatal stage to 18 years old. The majority of comparison groups were treatment as usual.

Of the 16 studies assessed, 11 were assigned low-risk of bias (Adkins, Luyten & Fonagy, 2018; Ashton, O'Brien-Langer & Silverstone, 2016; Byrne et al., 2019; Huber, McMahon & Sweller, 2015; Kohlhoff et al., 2016; Maupin et al., 2017; Menashe-Grinberg et al., 2022; Pajulo et al., 2012; Sadowski, Goff & Sawyer, 2022; Salo et al., 2019; Sleed, Slade & Fonagy, 2020).

The other 5 studies were deemed to be at high-risk of bias due to attrition rates, lack of power, classification of participants to interventions or lack of reporting of information (Cox et al., 2021; Enav et al., 2019; Hertzmann et al., 2016; Lewis et al., 2022; Williams et al., 2018).

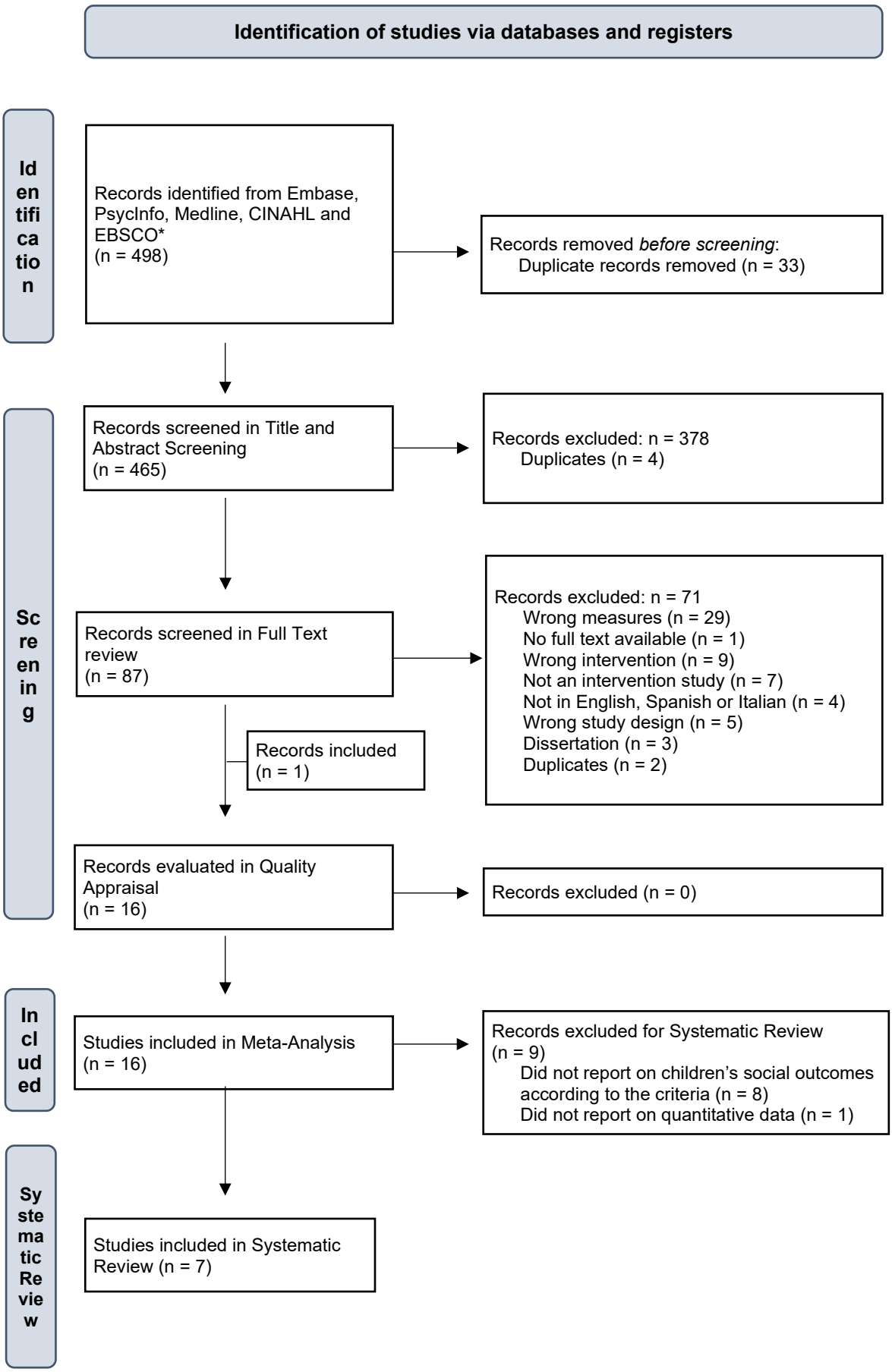

Figure 4.1. PRISMA Flow Diagram Meta-Analysis and Systematic Review

*Notes. *EBSCO – records were extracted from the "Child Development & Adolescent studies" section. Figure adapted from: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71*

Table 4.1 Summary of Study Characteristics

	First author	***Study design***	***Population***	***Intervention***	***Comparison intervention***	***Sample Size (post-testing)***	***RF measurement***	***Duration of intervention***	***Parental Age (mean (SD)***
a	J. Salo S	RCT	Pregnant women with depressive symptoms	Nurture and Play: Mentalisation-based perinatal group intervention	Women receiving TAU – no parenting-based intervention	n = 45 Intervention: 24 Control: 21	PI, PD	From pregnancy to baby's age of 7 months	n/r
b	E.S. Williams A	NR	Women clinically identified with BPD	Dialectical behaviour therapy skills	No control group	n = 29	PRFQ	24 weeks	Intervention: 31.97 years (5.88)
c	Adkins T	RCT	Foster parents	Family Minds: Group mentalizing psychoeducational parenting intervention	Parents receiving typical foster training class as offered in the area	n = 89 Intervention: 49 Control: 40	PRFQ, RF-FMSS	4-6 weeks	*Intervention*: 43.45 years (9.89)
d	Hertzmann L	Mixed-methods naturalistic RCT	Parents in entrenched conflict	MBT-PT: MBT adaptation with a psycho-educational group intervention for parents	Parents receiving TAU – a nationally available parent psycho-education program offered to this population	n = 30 Intervention: 16 Control: 14	PDI, PRFQ	6-12 weeks	n/r
e	Sleed M	Cluster RCT	Mothers and babies in prison	New Beginnings: Manualized attachment-based intervention	Mothers receiving standard health and social care provision as provided by the prison service	n = 163 Intervention: 88 Control: 75	PDI	4 weeks	*Intervention:* 26.2 years (6.40) *Control:* 27.6 years (5.60)
f	Enav Y	NR	Parents of children with ASD	Mentalization-based group intervention	Parents receiving delayed treatment	n = 68 Intervention: 38 Control: 30	PDI	4 weeks	*Intervention:* 46.1 years (7.09) *Control*: 44.15 years (7.85)
g	Cox H	RCT	Expectant parents	Baby CHAT: single-session group antenatal intervention incorporating 4D scan video footage	Parents receiving delayed intervention	n = 20 Intervention: 11 Control: 9	P-PRFQ	60-minute	*Intervention:* Range – 30-39 *Control:* Range – 30-39

Notes. RCT = Randomised Controlled Trial; NR = Non-Randomised controlled trial; BPD = Borderline Personality Disorder; ASD = Autism Spectrum Disorder; MBT = Mentalisation-Based Therapy; TAU = Treatment As Usual; CHC = Community Health Centre; PI = Pregnancy Interview; PDI = Parent Development Interview; PRFQ = Parental Reflective Functioning Questionnaire; RF-FMSS = Reflective Functioning Five-Minute Speech Sample; n/r = not reported.

	First author	Study design	Population	Intervention	Comparison intervention	Sample Size (post-testing)	RF measurement	Duration of intervention	Parental Age (mean (SD)
h	Lewis M	Pilot feasibility	Carers of children who are looked after, on the edge of care or adopted	Enfys nurturing attachments group intervention	No control group	n = 51	PRFQ	6 months	n/r
i	Menashe-Grinberg A	Longitudinal follow-up study	Moms in general population	DUET program reflective parenting-based group program	No control group	n = 70	PDI	12 weeks	*Intervention*: 34.84 years (4.63)
j	Sadowski C	Mixed-method study of two modes of the intervention	Parents and workers in general population	Circle of Security: 20-week group centre-based parent education and psychotherapy	Parents receiving individually home-based mode of the same intervention	n = 14 Intervention: 7 Control: 7	PRFQ	20 weeks	*Intervention*: 35.29 years (8.86) *Control:* 32.9 years (5.67)
k	Huber A	Evaluation/ exploration – non-experimental design	Parent-child dyads referred to a metropolitan community-based child mental health service	Circle of Security intervention	No control group	n = 73	Circle of Security Interview (COSI) coded using the RF scale	20 weeks	n/r
l	Kohlhoff J	Pilot study	Women with a child aged 2 years of age or younger	The Circle of Security Parenting (COS-P) intervention	No control group	n = 15	PRFQ	8 weeks	*Intervention*: 31.6 years (3.67)
m	N. Maupin A	Multi-site evaluation – non-experimental design	Caregivers with young children	The Circle of Security Parenting (COS-P) intervention	No control group	n = 71	PRFQ	n/r	n/r
n	Pajulo M	Evaluation/ exploration – non-experimental design	Substance-abusing mothers in Finland	Residential treatment: relationship-based intervention	No control group	n = 34	PI, PDI-R	9 months (mean)	*Intervention*: 25.1 years (5.8)
o	K. Ashton C	Retrospective study	Children who have attachment related diagnoses	The CASA Trauma and Attachment Group (TAG) Program	No control group	n = 40	PRFQ	8 months	n/r
P	Byrne G	Pilot study	Parents of children identified as at-risk of disorganised attachment	The Lighthouse MBT Parenting Programme	No control group	n = 16	PDI, PI	20 weeks	n/r

Notes. RCT = Randomised Controlled Trial; NR = Non-Randomised controlled trial; BPD = Borderline Personality Disorder; ASD = Autism Spectrum Disorder; MBT = Mentalisation-Based Therapy; TAU = Treatment As Usual; CHC = Community Health Centre; PI = Pregnancy Interview; PDI = Parent Development Interview; PRFQ = Parental Reflective Functioning Questionnaire; RF-FMSS = Reflective Functioning Five-Minute Speech Sample; n/r = not reported.

4.3.1 Meta-analyses

The eligible studies were extracted for data on changes in parental reflective functioning following intervention, summarised in Table 4.2.

We found that, overall, group parenting interventions had a statistically significant positive effect on parent mentalisation, with a small to moderate increase compared to control conditions (standardised mean difference = .44, 95% CI 0.24-0.64, p<0.01) (see Figure 4.2). However, there was significant heterogeneity among the studies (Q = 53.20, p<0.01, I2 = 72%), indicating moderate to high variation in the results. Due to this, we decided to explore whether the observed heterogeneity can be explained by the different measurement methods used in the studies.

The studies were split into subgroups (self-report (N = 9) and interview (N = 9)) and meta-analyses were run on these groups. Significant increases in parent mentalisation were still found in both subgroups, although studies using self-report showed a smaller effect size (SMD = 0.31, 95% CI 0.04-0.57, p=0.02) than studies that used interviews (SMD = 0.50, 95%CI 0.21-0.78, p<0.01) (see Figures 4.3 and 4.4). Heterogeneity reduced for both subgroups, although there was still moderate heterogeneity for the self-report studies (Q = 18.55, p=0.04, I^2 = 57%) and high heterogeneity for studies using interviews (Q = 25.44, p<0.01, I^2 = 69%).

Potential publication bias was examined by using Egger's regression and a funnel plot. The Egger's regression intercept was not significant ($\hat{b}0$ =0.22, z=0.97, p=0.33). There is also no asymmetry presented in study level funnel plot (Figure 4.5). These results indicated that there is unlikely to be any publication bias that can have an impact on the conclusions of the meta-analysis.

Table 4.2. Summary of Cohort Study Findings (Parent Reflective Functioning)

					Intervention group		***Control group***	
	First author	***Study design***	***Data extraction (pre-, post-testing)***	***Measurement***	***Pre-intervention (mean, SD)***	***Post-intervention (mean, SD)***	***Pre-intervention (mean, SD)***	***Post-intervention (mean, SD)***
a	J. Salo S	RCT	At pregnancy, at child's age of 12 months	PI, PDI	3.31, 0.75	3.63**, 1.00	2.65, 1.44	2.92, 1.45
b	E.S. Williams A	NR	At start of intervention, on completion of intervention	PRFQ-PM PRFQ-CMS	2.53, 1.17 5.27, 1.09	1.90**, 0.77 5.81**, 1.03	n/r	n/r
c	Adkins T	RCT	At start of intervention, at 6-week follow-up	PRFQ- PM PRFQ- CMS PRFQ-IC RF-FMSS	2.08 ± 0.89 2.82 ± 1.06 6.02 ± 0.54 4.42 ± 1.39	1.65* ± 0.60 3.00 ± 1.05 6.18 ± 0.58 5.11* ± 1.52	2.26, 0.95 3.19, 1.03 5.83, 0.63 4.30, 1.34	2.10, 0.66 3.29, 1.12 5.81, 0.56 4.80, 1.48
d	Hertzmann L	Mixed-methods naturalistic RCT	At start of intervention, at 6-month follow-up	PRFQ-PM PRFQ-CMS PRFQ-IC PDI	2.26, 0.88 3.90, 1.18 6.04, 0.69 3.92, 1.08	2.19, 1.07 4.02, 1.14 6.01, 0.64 3.09, 1.30	2.10, 1.05 4.41, 1.11 5.96, 0.86 3.60, 1.17	1.81, 0.92 4.06, 1.28 6.01, 0.56 3.25, 1.29
e	Sleed M	Cluster RCT	At start of intervention, at 1-week follow-up	PDI	3.18, 1.38	3.54**, 1.57	3.59, 1.47	3.15, 1.33
f	Enav Y	NR	At start of intervention, on completion of intervention	PDI	4.39, 0.87	5.17***, 1.08	4.25, 0.84	4.19, 1.18
g	Cox H	RCT	At start of intervention, at 2 weeks follow-up	P-PRFQ	69.27, 10.73	75.2†, 10.73	56.22, 11.21	58.00, 11.71
h	Lewis M	Pilot feasibility study	At start of intervention, on completion of intervention	Total PRFQ	67.53, 65.65	70.93**, 48.1	n/r	n/r
i	Menashe-Grinberg A	Longitudinal follow-up study	At start of intervention, on completion of intervention	PDI	4.41, 0.14	4.75*, 0.17	n/r	n/r
j	Sadowski C	Mixed-methods study of two modes of the intervention	At start of intervention, on completion of intervention	PRFQ-PM PRFQ-CM PRFQ-IC	2.54, 0.75 3.47, 0.81 5.73, 0.43	2.14**, 0.86 3.85, 0.67 5.88, 0.78	n/r	n/r

*Notes. RCT = randomized controlled trial; NR = non-randomized controlled trial; PI = pregnancy interview; PDI = parent development interview; PRFQ = parental reflective functioning questionnaire; PRFQ-PM = pre-mentalizing subscale; PRFQ-CMS = certainty in mental states subscale; PRFQ-IC = interest and curiosity subscale; RF-FMSS = reflective functioning five-minute speech sample; SD = standard deviation; n/r = not reported. * p < 0.05, ** p < 0.01, *** p < 0.001.* †significant positive change in PRF in intervention group (Cohen's *d* = 0.68) but p-value not reported.

Table 4.2. Continued.

k	**Huber A**	**Evaluation/ exploration - non-experimental design**	**No more than 6 weeks before intervention, within 6 weeks of the final group session**	**COSI**	**4.01, 1.48**	**4.63**, 1.41**	**n/r**	**n/r**
l	Kohlhoff J	Pilot study	At start of intervention, on completion of intervention	PRFQ-PM PRFQ-CMS	11.93 ± 5.80 21.6 ± 6.252	9.6 ±4.08 25.0** ± 6.40	n/r	n/r
m	N. Maupin A	Multi-site evaluation, non-experimental design	At start of intervention, on completion of intervention	PRFQ-PM PRFQ-CMS PRFQ-ICS	2.29, 1.29 4.09, 1.16 5.84, 1.02	2.33, 1.43 4.19, 1.04 5.71, 1.25	n/r	n/r
n	Pajulo M	Evaluation/exploration, non-experimental design	At start of intervention (prenatally), postnatally	PI, PDI	2.40, 1.30	3.00*, 1.00	n/r	n/r
o	K. Ashton C	Retrospective study	At start of intervention, on completion of intervention	PRFQ	4.84, 0.37	5.05*, 0.35	n/r	n/r
p	Byrne G	Pilot study	At start of intervention, on completion of intervention	PDI	3.3, 0.8	3.5, 1.6	n/r	n/r

*Notes. RCT = randomized controlled trial; NR = non-randomized controlled trial; PI = pregnancy interview; PDI = parent development interview; PRFQ = parental reflective functioning questionnaire; PRFQ-PM = pre-mentalizing subscale; PRFQ-CMS = certainty in mental states subscale; PRFQ-IC = interest and curiosity subscale; RF-FMSS = reflective functioning five-minute speech sample; SD = standard deviation; n/r = not reported. * p < 0.05, ** p < 0.01, *** p < 0.001.* †significant positive change in PRF in intervention group (Cohen's *d* = 0.68) but p-value not reported.

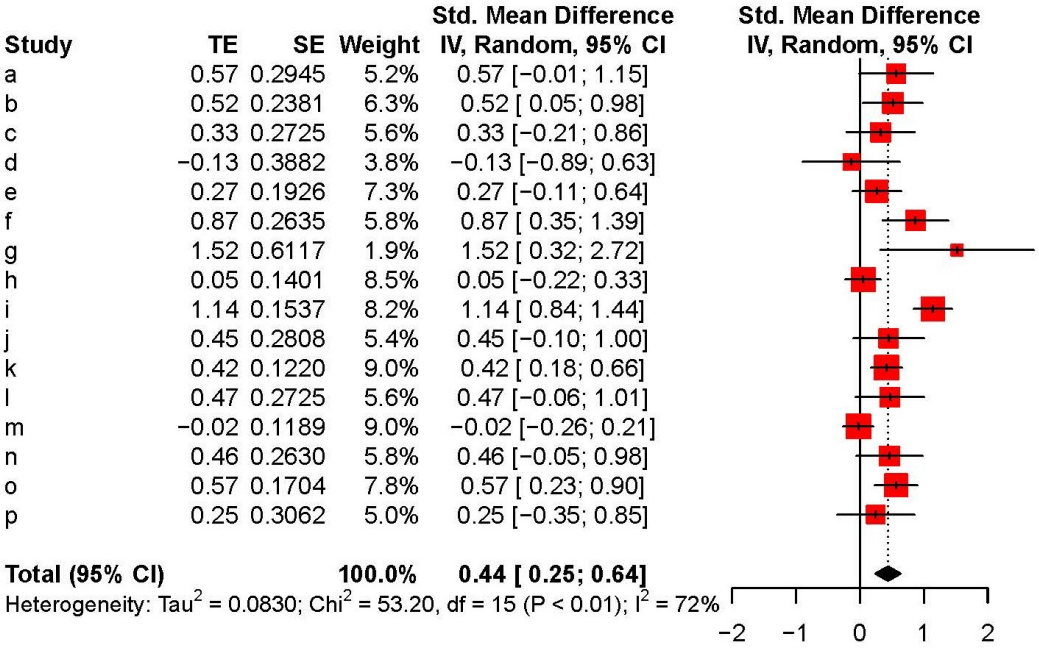

Figure 4.2. Forest plot of the meta-analysis. Effect sizes of all eligible studies and the global pooled effect sizes are listed.

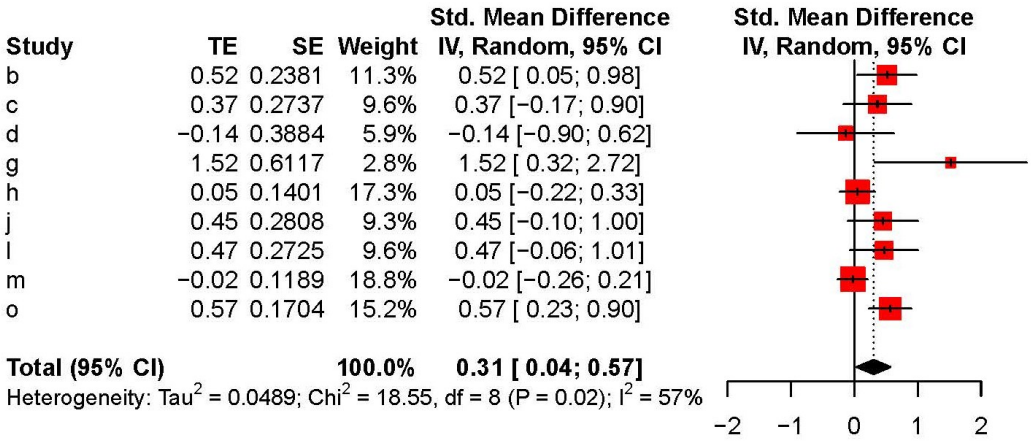

Figure 4.3. Effect sizes and the pooled effect size for studies that used self-report questionnaires to assess parental reflective functioning.

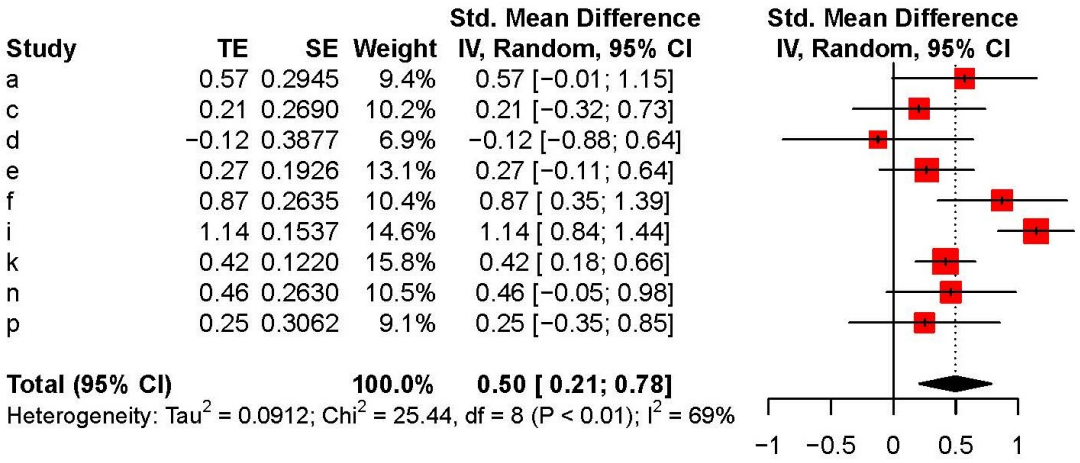

Figure 4.4. Effect sizes and the pooled effect size for studies that used interview to assess parental reflective functioning.

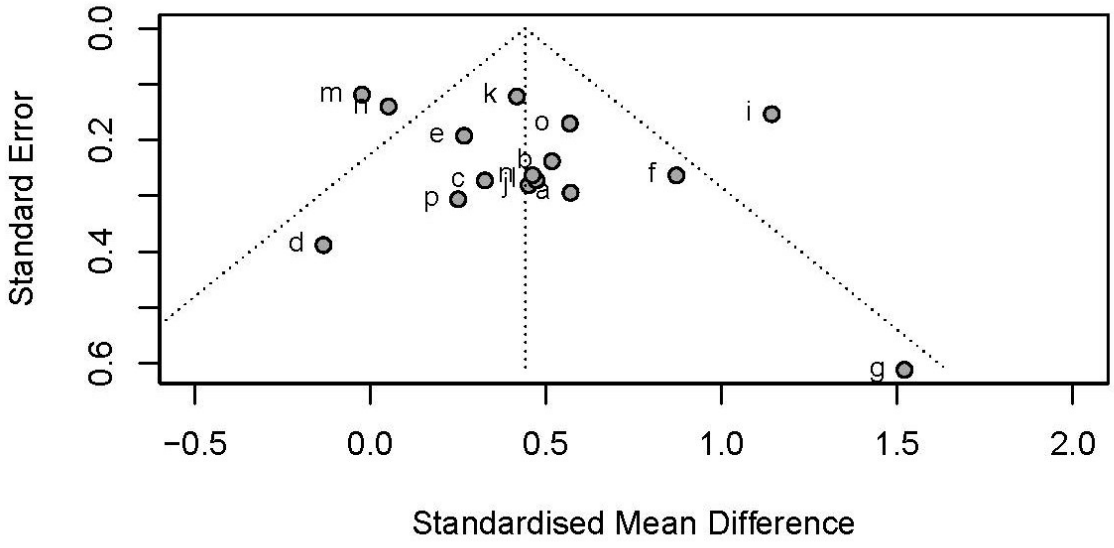

Figure 4.5. Funnel plot of standard error by standardised mean difference (Hedge's g). The distribution of all eligible studies is shown.

4.3.2 Systematic Review

For the studies that reported quantitative data, it appears that parent mentalisation may impact some aspects of child social outcomes (Adkins et al., 2022; Enav et al., 2019; Hertzmann et al., 2016; Huber, McMahon & Sweller, 2015; Menashe-Grinberg et al., 2022; Sleed, Slade & Fonagy, 2020). There was an improvement in parent-child interactions, general social skills, attachment security and emotions that can interfere with social interactions like irritability. There was no change in child mind-mindedness (i.e. mentalisation) or in social withdrawal. There were mixed results for the Strengths and Difficulties Questionnaires: while some researchers reported that there was a significant improvement in total difficulties, peer problems and prosocial behaviours, other researchers report that, following parent interventions, there were no changes in internalising problems such as peer problems. Overall, these results together tentatively suggest that improving parent mentalisation may play a role in a child's social abilities, but currently there is not enough evidence to make concrete conclusions, and more studies examining the causal link between parent mentalisation and child social outcomes are needed.

Table 4.3 Summary of Study Characteristics – Children's Social Outcomes

	First author	***Study design***	***Data extraction (pre-, post-testing)***	***Measurement***	***Sample size (post-testing)***	***Age (mean)***
b	E.S. Williams A	NR	At start of intervention, on completion of intervention	CARE-Index	23	Intervention: 15.10 months
c	Adkins T	RCT	At start of intervention, at 6-week follow-up	SDQ (peer) SDQ (pro social)	32	Intervention: 81.54 months
d	Hertzmann L	Mixed-methods naturalistic RCT	At start of intervention, at 6-moth follow-up	SDQ (internalising) SDQ (externalising) SDQ (total)	Intervention: 16 Control: 14	Intervention: 8.7 years
e	Sleed M	Cluster RCT	At start of intervention, at 1-week follow-up	CIB (Dyadic Atunement) CIB (Child Involvement)	Intervention: 51 Control: 37	Intervention: 4.9 months Control: 4.4 months
f	Enav Y	NR	At start of intervention, on completion of intervention	ABC (Social withdrawal)	Intervention: 38 Control: 30	Intervention: Range – 3-18 years
i	Menashe-Grinberg A	Longitudinal follow-up study	At start of intervention, on completion of intervention	EA parent-child interaction CBCL SSRS Child-MM	70	Intervention: 4.3 months
k	Huber A	Non-experimental design	No more than 6 weeks before intervention, within 6 weeks of the final group session	SSP (Security) SSP (Avoidance) SSP (Ambivalence) SSP (Disorganisation)	55	Intervention; 47.80 months

Notes. NR = Non-Randomised controlled trial; RCT = Randomised Controlled Trial; SDQ = Strengths and Difficulties Questionnaire; CIB = Coding Interactive Behaviour; ASQ.SE = Ages & Stages Questionnaire – Social-Emotional; CDQ = Cognitive Development Questionnaire; ABC = Aberrant Behaviour Checklist; SSP = Strange Situation Procedure; EA = Emotional Availability; CBCL = Child Behaviour Checklist; SSRS = Social Skills Rating System ; MM = Mind-Mindedness; n/r = not reported.

4.4 Discussion

The aim of our meta-analysis was to determine if group interventions can improve parent mentalisation – 13 out of the 16 studies included reported significant improvements in parent mentalisation, using a variety of different measures. The aim of our systematic review was to understand whether any change may impact on children's social outcomes – 5 out of the 7 studies reported post-intervention improvements in social skills, behaviour problems and social behaviours. The meta-analysis suggests that group intervention can positively impact parents' ability to mentalise, regardless of whether they have significant vulnerabilities such as mental health problems or substance misuse, or whether they are from the general population. Our findings add to the existing literature supporting the possible importance of parental mentalisation for children's wellbeing.

Our results suggest that group intervention can affect parents' ability to mentalise in a positive way, whether they are parents with significant vulnerabilities, expectant parents, or parents from the general population. Improving a parent's ability to mentalise about their child is associated with many benefits, including improved attachment behaviours and more sensitive parenting (Camoirano, 2017; Ordway et al., 2015; Slade et al., 2005; Slade et al., 2020). The findings of this review add to the existing literature supporting the importance of parent mentalisation for families. Further evidence for the clinical outcomes of improved parental mentalisation could shift clinical focus, allowing parent mentalisation to be conceptualised as an intervention target for all families. Equally, our results suggest promising evidence for the effectiveness of group therapies in enhancing parent social functioning. The implementation of purposeful group experience can help shift clinical focus to the use of group interventions for parent mentalisation. Group interventions reduce clinical staff workload, reduce costs for services and provide support and social connections for parents, which can all enhance the efficacy of an intervention (Moran et al., 2004)

The developmental and clinical aspects of improvement in parent mentalisation continue to lack empirical support in the literature. The systematic review suggests that improved parent mentalisation may be related to improved social functioning in children, including improvement in attachment security and other pro-social behaviours. However, these findings are predominantly observational, and not sufficient in establishing a direct statistical association between parent and child. Additionally, the majority of studies conducted short-term follow-up analyses, with the longest being at one-year post-intervention. Some patients could take longer to respond to treatment, with children's social outcomes becoming apparent years after therapy. Therefore, there is a need for studies that focus on following cohorts longitudinally, conducting longer and more frequent follow-ups to look for long-term effects, and tease-out potential intergenerational outcomes.

It is apparent from our results that there is a need for further research on the outcomes of group interventions for parents of children beyond the age of 5. Studies focusing on mid- to late-childhood and adolescence are needed to gain a better understanding of how mentalising ability can be improved at different life stages, as well as better understanding of the long-term effects of group parenting interventions on social outcomes of offspring. A conceptual issue that was noted of the studies included in our review is that the social outcomes of children were reported by parents and are therefore subjective to the parents' perspective. Collecting data directly from children, or from objective observers such as teaching staff, in addition to parent observations, would provide a more comprehensive view of social outcomes. Finally, there is a lack of studies investigating the effectiveness of improving parent mentalisation through group interventions for parents of children diagnosed with common mental health problems, including eating disorders, anxiety or depression; this is an area that requires further exploration.

The meta-analysis revealed a high level of heterogeneity ($I^2 > 70\%$) among the included studies, primarily stemming from the method of data collection. Studies using questionnaires demonstrated lower heterogeneity ($I^2 = 57\%$) than those using interviews ($I^2 = 69\%$). This divergence in effect sizes may be attributed to differences in data collection methods, with questionnaires offering standardised responses due to their self-administered nature, while interviews introduce more variability due to direct interactions between interviewers and participants, resulting in nuanced but variable data. These findings underscore the need for potential improvements in PRF measurement. While some of the heterogeneity was demonstrated to be due to measurement differences, there was still a significant amount that was unexplained. Establishing why there is diversity in effect sizes emerging from parent group studies would greatly benefit the reliability of our findings.

Our paper provides valuable insights for future research methodologies in the field of psychoanalysis. One common limitation observed in many of the studies was the reliance on language-based mentalisation scores, potentially introducing language-related biases. This limitation is particularly relevant as some parents may struggle to express their emotions in English or rely on non-verbal communication for complex emotional experiences. Researchers could consider alternative measures, such as non-verbal assessments like Shai and Belsky's theory, which focuses on body movement as a means of conveying mental states (Shai & Belsky, 2017), or the interactional measure of mind-mindedness (Fishburn et al., 2017), which examines gestures and facial expressions. The adoption of such alternative measures would facilitate a more inclusive representation of parents from diverse backgrounds.

There were a number of limitations in the meta-analysis and review. Firstly, only papers using quantitative measures of parent mentalisation were included, and non-verbal measures (i.e.

behavioural observations) were not used. Secondly, 5 studies were deemed as being at high risk of bias and potentially poor quality, limiting the interpretation of our results. Thirdly, only papers published in English, Spanish or Italian were included, excluding studies in other languages. Fourthly, there were some issues that arose when calculating the meta-analysis. Several studies did not report effect size, or enough data for calculation of an effect size, and some authors did not respond to requests for more information. This made it difficult when pooling for the meta-analysis. Additionally, the small sample sizes of the included studies might lead to failures in detecting differences in subgroup or moderator analyses, and the power of the meta-analysis could be undermined. Finally, a small number of studies in a meta-analysis or a systematic review can limit the robustness of conclusions drawn from the analysis (Huedo-Medina et al., 2006). It may reduce the statistical power to detect meaningful effects and increase susceptibility to publication bias. Furthermore, the generalisability of findings may be compromised, emphasising the importance of cautious interpretation and the need for additional research to strengthen the evidence base. We encourage future large, randomised control trials in this area, to provide more reliable results.

Overall, our findings suggest that using a group intervention to improve parental mentalisation is an effective approach and can be implemented for parents with or without their own mental health problems. Additionally, it is possible that improvements in mentalisation following the intervention may be positively impacting children's social outcomes. Future research studies should focus on establishing a causal link between improved parent mentalisation and children's social outcomes, increasing use of randomised control trials and understanding heterogeneity between studies focused on parent group interventions.

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Chapter 5: Changing Parental Reflective Functioning for Parents of Adolescents with Eating Disorders: the Role of Short, Parent-Focused Groups

5.1 Introduction

Mentalisation, or reflective functioning (RF), refers to the ability to understand mental states, in oneself and in others, and how these drive behaviour (Allen, Fonagy & Bateman, 2008; Fonagy et al., 1991). Parental reflective functioning (PRF) refers to the ability of a parent to hold their child's mental states in mind (Slade et al., 2005).

5.1.1 Parental Reflective Functioning

PRF has been associated with parental satisfaction, positive parenting and quality of caregiving (Rostad & Whitaker, 2016). These are important factors for a child's development of social skills and emotional health (Adkins, Luyten & Fonagy, 2018). PRF is associated with children's own ability for mentalisation; there is research evidence that mentalisation is better developed in children with parents who were able to mentalise well (Camoirano, 2017). The ability to recognise one's own and one's child's emotional states as individual and separate is crucial to sensitive parenting (Ordway et al., 2015). When parents are unable to do this, they will find it difficult to understand the meaning or intention behind their child's actions and will not be able to respond in a nurturing and supportive way. They may assume that their child is trying to embarrass or hurt them and respond in a way that matches their inaccurate interpretation. When children receive confusing and chaotic responses to their behaviours, it can reduce their own ability to learn to regulate emotions (Ordway et al., 2015), a problem that is common across many mental health conditions (Sheppes, Suri & Gross, 2015).

While impairments in mentalisation are seen across many different psychological disorders, it appears that high levels of PRF may protect children against the negative social and emotional effects of early adversity (Luyten et al., 2020). There is an inverse relationship between maternal PRF and internalising behaviours, such as depression and anxiety, and between maternal PRF and externalising behaviours, like physical aggression (Ensink et al., 2017). Maternal PRF also mediates the relationship between child sexual abuse and the development

of psychiatric symptoms, with better maternal PRF disrupting the relationship between childhood trauma and poor mental health (Ensink et al., 2017). Other studies have suggested that higher PRF is associated with higher child mentalisation, which in turn is associated with fewer depressive symptoms in children (Ensink et al., 2015; Ensink et al., 2016). For children with anxiety disorders and those who struggle to regulate their emotions, their mothers appear to have poorer mentalisation ability (Camoirano, 2017). It has been suggested that struggling to understand mental states, both of oneself and of others, can lead to disruption in effective communication with others which in turn can result in interpersonal problems and a more negative affect (Ivanova et al., 2015; Maxwell et al., 2017). It could be that high PRF positively influences a child's ability to mentalise about themselves and other people, which allows them to communicate appropriately with others. Consequently, improved communication may reduce children's negative affect, subsequently increasing their ability to regulate their own behaviour and so avoid the development of harmful coping strategies like self-harm or binge-eating.

5.1.2 Mentalisation and Eating Disorders

A group of young people that have consistently shown significant problems mentalising is those struggling with an Eating Disorder (ED), particularly Anorexia Nervosa (AN) (Rothschild-Yakar et al., 2019). There is so far limited, but promising, evidence for focusing on mentalisation in treatment of EDs across ED diagnoses (Malda-Castillo, Browne & Perez-Algorta, 2019). For example, Compare et al. (2018) found that there was a significant increase in ability to mentalise for adult women with binge-eating disorder (BED) following completion of an emotion regulation group therapy programme (Compare et al., 2018). In a systematic review, Jewell et al. (2016) noted that adolescents with EDs were less able to recognise emotions (an integral part of understanding others' mental states); poor mentalisation was associated with greater risk of developing an ED; and reduced activation of brain areas associated with mentalisation predicted poor ED treatment outcome (Jewell et al., 2016). Since this review, other studies have found similar results. Rothschild-Yakar et al. compared young people with AN who were receiving hospital treatment to young people without an ED, and found that individuals with AN showed lower ability to reflect on their own mental states than those without AN (Rothschild-Yakar et al., 2018). They also demonstrated a positive correlation between alexithymia (an aspect of mentalisation that involves the inability to describe one's own emotions), self-mentalisation (reflecting on one's own mental states) and ED symptoms across both patients and healthy controls such that elevated ED symptoms were predicted by higher alexithymia scores (Rothschild-Yakar et al., 2019). This may suggest that poor mentalisation may play a role in the development of an ED. Jewell et al. (2021)

followed young people receiving treatment for AN and found that parental certainty, where parents are excessively certain about mental states, predicted poor clinical outcome at nine months (Jewell et al., 2021). While there is a lack of evidence about how mentalisation, particularly parent mentalisation, plays a role in the development and treatment of an ED, the literature from other areas of child and adolescent mental health suggests that PRF is a mechanism that mediates social emotional development; investigation into how PRF could potentially mediate a child's recovery from an ED is important.

5.1.3 Improving Parent Mentalisation

Programmes that encourage parents to be curious about their child's thoughts, beliefs and ideas have been successful in increasing parent confidence and sensitivity (Byrne et al., 2019). For example, the "*Healthy Start, Happy Start*" study is a randomised control trial which examined how a Video-feedback Intervention to promote Positive Parenting (VIPP) (Juffer, Bakermans-Kranenburg & Van Ijzendoorn, 2008) could improve young children's behaviour by improving parent sensitivity (Ramchandani et al., 2017). Behaviour problems were lower for children whose parents received the intervention, compared to the control group of usual care (O'Farrelly et al., 2021).

Interventions have been created to focus specifically on improving PRF, to support children with developing healthy emotional regulation and mentalisation, theoretically reducing the risk of mental health problems later in life. For example, the "*Minding the Baby*" intervention is delivered at home by a multidisciplinary team from the start of pregnancy up until the baby's second birthday (Slade et al., 2005). The sessions focus on improving parents' abilities to respond sensitively to their child's needs and to recognise their own emotions as being separate from their child's. Longitudinal analysis suggests that this type of intervention can increase a parent's capacity for mentalisation, as well as lead to fewer referrals to child protection services and an increased likelihood of children being securely attached to their parents at one year old (Sadler et al., 2013; Slade et al., 2020).

Interventions such as "*Minding the Baby*" are seen as pre-emptive; there are few interventions that have focused on helping parents improve their PRF at a later stage in their child's development (Adkins, Luyten & Fonagy, 2018). Early adolescence is considered the second sensitive period in which to influence the development of children's brains, providing an excellent opportunity for psychological intervention (Dahl et al., 2017). Programmes focusing on parents of children with unmet psychological needs are beginning to emerge, with a particular focus on late childhood and early adolescence. Foster parents are often responsible for children at high risk of developing a mental health problem and it appears that having a

caregiver with low levels of stress may act as a protective factor for these children (Goemans et al., 2020). A short psychoeducational intervention, "*Family Minds*", showed promising results for foster parents; participants reported a decrease in parenting stress after attending the group, and showed improvements in PRF as measured by the Parental Reflective Functioning Questionnaire (PRFQ) (Luyten et al., 2017). Similarly, there was an increase in the ability to mentalise amongst foster parents and parents of recently adopted young people, following a parenting group that focused on psychoeducation (Bammens, Adkins & Badger, 2015). Adoptive parents were more able to support their child due to being able to better understand their child's independent emotional states; the authors propose that this increase in sensitive parenting may result in fewer placement breakdowns as parents are more able to recognise emotional distress in their child (Staines, Golding & Selwyn, 2019).

It is well established that children and adolescents with autism spectrum disorders (ASD) have difficulties mentalising, meaning that they may struggle to read, and therefore appropriately respond to, social cues from others (Baron-Cohen, 2000); these deficits in social cognition are difficult to influence and change (Green & Garg, 2018). There is evidence that there is a genetic basis to ASD, with high heritability (Tick et al., 2016), so parents of children with high ASD traits are also likely to demonstrate high ASD traits and therefore struggle to mentalise. Equally, as mentalisation is a bi-directional process, if individuals with ASD struggle to mentalise, their parents may struggle to mentalise about their child, even if they themselves do not have ASD. Parents of children with ASD report that, although they feel responsible for supporting their child's communication with others, they struggle to think of their child as a separate individual with their own unique emotions and mental states (Ansari, McMahon & Bernier, 2020). However, even for this group of parents, it appears that PRF can be enhanced, with positive impacts exhibited for their children. Parents who took part in a mentalisation-based group intervention showed improved PRF towards their child with ASD (Enav et al., 2019) and, at follow-up, parents reported a decrease in their child's behavioural and emotional problems.

However the existing research on PRF improvement has, to date, focused almost exclusively on parents of young children. A meta-analysis and systematic review (Chapter 4) that I supervised collated evidence which suggested that PRF changes through group intervention and can improve child outcomes; however, only three studies looked at parents of children over 10 years old (Donnelly et al., 2023). There are even fewer studies examining change in PRF for parents of children with EDs: to the best of my knowledge, the study described in Chapter 2 is the only study to have assessed parent mentalisation change through family therapy for EDs. If parents can improve their ability to mentalise about their child, it

theoretically makes sense that child mentalisation can therefore be changed, and that change in mentalisation may have a beneficial impact on clinical or social outcomes. In the systematic review I supervised of PRF and group interventions, we found that change in PRF was tentatively related to various positive social outcomes in a variety of children (Donnelly et al., 2023). However, in the study described in Chapter 2, I found that mentalisation change, both in parents and in children, did not predict ED treatment outcomes. The Chapter 2 study looked at overall mentalisation, rather than mentalisation about one's child, so it is possible that PRF specifically may have more of an effect on children's outcomes.

5.1.4 The Current Study

As discussed, previous research has looked at how interventions can improve PRF (Bammens, Adkins & Badger, 2015; Donnelly et al., 2023) and whether that change may be reflected in positive changes for children. However, none have looked at whether PRF can change during brief, parent-focused interventions aimed at parents of adolescents receiving treatment for an ED, and whether that change predicts clinical outcomes.

In 2007, an early intervention programme for parents was established in a Tier 3 child and adolescent ED service (Nicholls & Yi, 2012). The intervention was subsequently manualised and evaluated. It consists of a parent group, delivered immediately after a family's first assessment with an outpatient service. The group was designed to bridge the gap between referral and beginning treatment that many families experience, aiming to support parents as early and as intensively as possible post diagnosis. Early intervention in ED treatment is essential for preventing entrenchment of disordered behaviours and improving individuals' chances of full recovery (Takakura et al., 2019; Treasure & Russell, 2011). The group runs as a rolling programme and consists of six 1.5-hour sessions over six weeks. The sessions aimed to increase parental confidence, knowledge and skills, enabling them to adhere to meal plans and effectively tackle their child's ED as a family (Nicholls & Yi, 2012). The group is delivered as a mixture of teaching from clinicians, and parent conversation and reflection. Feedback from this group is that parents welcome the opportunity to express their personal experiences, and they appreciate group discussions and information about ED management and meeting other families in the same position (Nicholls & Yi, 2012). This intervention is now being run across the UK in approximately 40 different services. A preliminary study showed that participation in the group was associated with weight gain and improved ED psychopathology in children by the end of the six-week programme and these gains were sustained at six months (Rosello et al., 2021b).

5.2 Aims and Hypotheses

The current study aimed to investigate whether PRF plays a crucial role as an underlying mechanism through which early treatment response operates in ED cases. Specifically, I examine how PRF changes for parents who are enrolled in Surrey Early Intervention for Child and Adolescent Eating Disorders group. I examine whether these parents exhibit rapid and significant improvement in PRF during the critical initial weeks of their child's treatment, which are integral for favourable ED treatment prognosis (Doyle et al., 2010; Hughes et al., 2019; Madden et al., 2015). Additionally, I aimed to assess whether change in PRF relates to any changes in health outcomes of their children. Finally, I aimed to assess what baseline factors (in both adolescent and adult) would predict change in PRF.

I hypothesised that:

1. PRF will increase over the duration of the parent group; there will be an improvement on the Parental Reflective Functioning Questionnaire (PRFQ) (Luyten et al., 2017) and on the Lack of Emotional Clarity subscale of the Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004) over six weeks.
2. Increase in PRF will predict improvements in children's health outcomes after 12 weeks; a positive change on the PRFQ or on the DERS Lack of Emotional Clarity subscale will predict an improvement in children's %mBMI after 12 weeks.
3. Baseline parent and child factors will predict how much change occurs in PRF; low levels of autistic traits in parents (measured using Autism Screening Questionnaire (AQ-10) (Berument et al., 1999)) will predict greater change on the PRFQ and DERS Lack of Emotional Clarity; low levels of ED symptoms in children (measured using EDs Examination – Questionnaire Short **(**EDE-QS) (Gideon et al., 2016)), low levels of child autistic traits (measured using Social and Communication Disorders Checklist (SCDC) (Skuse, Mandy & Scourfield, 2005)) and high levels of child mentalisation (measured using the Reflective Function Questionnaire for Youth (RFQ-Y) (Sharp et al., 2022)) will predict greater change on the PRFQ and DERS Lack of Emotional Clarity.

5.3 Methodology

5.3.1 Design

The study was a prospective observational study of parents of children with EDs recruited as their children began treatment with a specialist ED team. It was a non-randomised, naturalistic, repeated measures design, evaluating a group clinical intervention that is currently being used in some specialist child and adolescent ED services.

5.3.2 Population

Families were recruited from NHS Children and Young People's community ED services in England that deliver the Surrey Early Intervention for Child and Adolescent EDs parent group. The group is offered as part of routine treatment and to all parents whose children are under the care of the community ED team.

5.3.2.1 Parent Participation Criteria

Inclusion criteria:

- Participants were parents and/or primary caregivers of children who had recently been assessed as needing treatment within a specialist ED outpatient service, in line with national guidelines (NICE, 2017).
- Parents needed adequate English to provide informed consent and to complete the questionnaires.
- Parents had agreed to attend at least four of the sessions of the six-week parenting group intervention. Of the parents who did agree to take part, there were no drop-outs from the group, with each parent attending at least four sessions.

Exclusion criteria:

- Parents must not have attended the parent group before.
- Parents must not have received any form of family therapy before, either for themselves or any of their children. This was to ensure that parents were "naïve" to therapy, in order to more adequately assess changes in reflective functioning.
- Participants must not currently be receiving their own mental health treatment.

5.3.2.2 Child Inclusion Criteria

- Participants were under the age of 18.
- Participants were currently receiving and/or were waiting to receive treatment from a specialist ED outpatients' service when the parent group began. Two families were on the waiting list to receive family therapy and began receiving this support by the midpoint of the group.
- Participants had been given a diagnosis of an ED.
- Participants were new to ED services (i.e. this was their first experience of receiving treatment from secondary care services). Several children had received inpatient care on a paediatric ward prior to receiving any support from ED services and were included in the study as they were new to family therapy. One family was excluded from the study because, although they were new to ED services, they had received family

therapy previously for another mental health problem, and their child was currently an inpatient on a general child and adolescent mental health ward.

- Participants' parent(s) had agreed to take part in the parent group. While parents were able to take part in the study if their child did not want to take part, children were unable to continue taking part if, for example, their parent decided to stop.

5.3.3 Intervention

5.3.3.1 The Surrey Early Intervention for Child And Adolescent EDs

The Surrey Early Intervention for Child and Adolescent EDs is a manualised group intervention for parents who have a child receiving secondary care for an ED (Nicholls & Yi, 2012). It was designed to be attended by parents straight after assessment and diagnosis, to equip parents with the knowledge and skills needed to start the recovery process, in contexts where first line psychological therapies may not be immediately available (Rosello et al., 2021a). The aim is to provide information, ideas and validation to increase parental confidence that they can engage in treatment and support their child's recovery (Nicholls & Yi, 2012). The group consists of six sessions of 1.5 hours, and covers information about EDs, how EDs affect families, communication with a child with an ED, stages of change in EDs, managing behaviours and effective meal planning, amongst other things. Attendance at the group is associated with improved ED symptomatology and weight gain (Rosello et al., 2021a), and improvement in parent confidence and skills in managing their child's ED (Eshkevari et al., 2022).

5.3.4 Measures

For a visual guide to data collection timepoints, see Figure 5.1.

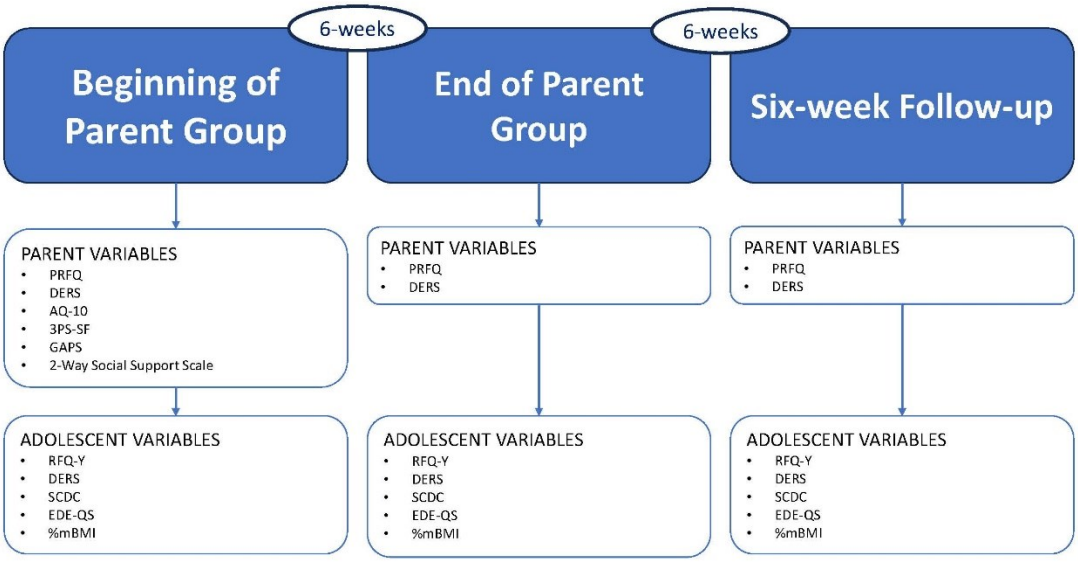

Figure 5.1. A timeline of data collection points, and the measures which were collected at each timepoint.

5.3.4.1 Parent Questionnaires

Parental Reflective Functioning Questionnaire (PRFQ) (Luyten et al., 2017)

The Parental Reflective Functioning Questionnaire is a self-reported, multi-dimensional questionnaire consisting of 18 items (Luyten et al., 2017). For example, "*I always know what my child wants"* and "*I like to think about the reasons behind the way my child behaves and feels".* It aims to establish mentalisation in parents based on three subscales. The Pre-Mentalising Modes subscale assesses a parent's ability to interpret a child's behaviour without making inappropriate or incorrect assumptions about the child's intentions – high scores on this subscale suggests poor mentalisation. The Certainty in Child's Mental States subscale measures a parent's ability to recognise the limitations of their ability to understand their child's thoughts and feelings – high and low scores (i.e. certainty vs uncertainty) suggest poor mentalisation. Finally, the Interest and Curiosity subscale measures a parent's curiosity and willingness to understand their child's mental states - high and low scores (i.e. complete lack of interest vs intrusive interest) suggest poor mentalisation. Each subscale consists of six statements, measured on a 7-point Likert scale, from 'strongly disagree' to 'strongly agree'. The PRFQ subscales demonstrate acceptable internal consistency (Cronbach's α=.73 (Pre-mentalizing Modes), α=.83 (Certainty about Mental States), α=.71 (Interest and Curiosity)) (Carlone et al., 2023). Additionally, the PRFQ shows good criterion validity through associations with task-based measures of mentalisation like the Reading the Mind in the Eyes

Test (Pre-mentalizing Modes, r = -.25; Certainty about Mental States, r = .29; Interest and Curiosity, r = -.25) .

PRFQ was collected at the three study timepoints.

Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004)

The Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004) is a 36-item self-report measure assessing problems with emotion regulation, with high internal consistency (Cronbach's α = .82-.95; (Hallion et al., 2018), and test–retest reliability across 4 to 8 weeks (p < .01; Gratz & Roemer, 2004)). Each item is scored on a 5-point Likert scale, from Almost Never to Almost Always. For example, "*I care about what I am feeling"*. The DERS has six subscales: Nonacceptance of emotional responses; Difficulty engaging in goal-directed behaviour; Impulse control difficulties; Lack of emotional awareness; Limited access to emotion regulation strategies and Lack of emotional clarity. Higher scores on any of the scales suggest more emotion regulation problems. A subscale of particular interest for this study was the Lack of Emotional Clarity subscale, which measures an aspect of mentalisation – alexithymia. The Lack of Emotional Clarity subscale measures how much an individual is clear about the emotions they experience, with high scores indicating lack of understanding about emotions (Gratz & Roemer, 2004). DERS (including Lack of Emotional Clarity) was collected at the three study time points.

Short Autism Screening Quotient (AQ-10) (Berument et al., 1999)

**Completed only at baseline*

The original Autism Screening Quotient (AQ) was a 50-item self-report tool developed to assess autistic traits in adults without a learning disability. It has been used extensively in research (Baron-Cohen et al., 2001), and produces consistent results across time and culture (Cronbach's α = .84, test-retest reliability r = .95; (Broadbent, Galic & Stokes, 2013)). For this study, I used the AQ-10, which is a shortened form of 10 items (Allison, Auyeung & Baron-Cohen, 2012). Each item is measured using a 4-point Likert scale, from 'definitely agree' to 'definitely disagree'. A score of 6 or more indicates that person may have autism.

5.3.4.2 Child Questionnaires

Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004)

See above for description of the DERS and the Lack of Emotional Clarity Subscale. DERS was collected at the three study time points.

Reflective Functioning Questionnaire – Youth (RFQ-Y) (Sharp et al., 2022)

Child's mentalisation ability was measured using the shortened version of the Reflective Functioning Questionnaire for Youth (RFQ-Y) (Ha et al., 2013; Sharp et al., 2009). This is a 5-item self-report measuring reflective functioning, with a 6-point Likert scale from 'strongly disagree' to 'strongly agree'. Questions include "*In an argument, I keep the other person's point of view in mind*" and "*I'm often curious about the meaning behind others' actions".* Higher scores represent greater ability for mentalisation. Sharp et al (2022) correlated scores from the short version of the RFQ-Y with scores from other measures related to mentalisation, including the Child Eyes Test (Baron Cohen et al., 2001), suggesting good construct validity in a clinical sample (rs = .332) as well as good internal consistency (Cronbach's α = .75; Sharp et al., 2022). (Lund et al., 2022) RFQ-Y data was collected at the three study time points.

Eating Disorders Examination – Questionnaire Short (EDE-QS) (Gideon et al., 2016)

ED severity was measured using the short version of the ED Examination Questionnaire (EDE-QS) (Fairburn & Beglin, 2008). This is a 12-item self-report measure of ED pathology, with a 4 point-response scale, assessing symptoms over the previous seven days (Gideon et al., 2016). Questions include, "*Have you been deliberately trying to limit the amount of food you eat to influence your weight or shape (whether or not you have succeeded)?"* Higher scores indicate more problematic eating behaviours; a score of 15 or more indicates the potential presence of an ED. It is used routinely in health services and research and demonstrates good internal consistency in clinical and non-clinical groups (Cronbach's α = .84 to .96), and good convergent validity when compared to weight dissatisfaction scales (Pearson's r = .683) (Berg et al., 2012; Duffy et al., 2021). EDE-QS scores were collected at the three study time points. For those children who did not want to complete the questionnaires, patient notes were used to give assessment EDE-QS.

Social and Communication Disorders Checklist (SCDC) (Skuse, Mandy & Scourfield, 2005)
**This measure is completed by parents on behalf of their child.*

To assess for children's autistic traits, parents were asked to complete the Social and Communication Disorders Checklist (SCDC) (Skuse, Mandy & Scourfield, 2005). This is a 12-item questionnaire, with parents asked to rate situations on a 3-point Likert scale from 'Not True' to 'Very True'. The aim is to assess the extent to which a child demonstrates social difficulties; a score of 8 or above indicates that the child may have autism (Skuse et al., 2009). The SCDC is used routinely in many clinical and research settings, showing good test-retest reliability (ICC = .69) and internal consistency (Cronbach's α = 0.90) (Kuru et al., 2021; Robinson et al., 2011). The SCDC was completed only at baseline.

5.3.4.3 Baseline Covariates

Data was collected from parents on a number of covariates, based on previous research (Dieleman et al., 2020; Jang, Brown & Park, 2021; Rhind et al., 2016):

Big Three Perfectionism Scale (Short Form) (3PS-SF) (Feher et al., 2020)
**Completed only at baseline*

The Big Three Perfectionism Scale (Short Form) is a 16-item self-report questionnaire, assessing multidimensional perfectionism (Feher et al., 2020). For example, "*I have a strong need to be perfect*". There are three subscales (rigid, self-critical and narcissistic), and higher scores on each subscale suggest high levels of perfectionism, using a 5-point Likert scale of 'Strongly Agree' to 'Strongly Disagree' (Feher et al., 2020). Each of the subscales shows good internal consistency (rigid (α = 0.86), self-critical (α = 0.85), and narcissistic (α = 0.78)) and test-retest reliability (r = .79 (rigid), r = .474 (self-critical, r = .71- (narcissistic)) (Feher et al., 2020).

Guilt About Parenting Scale (GAPS) (Haslam, D. & Finch, 2016)
**Completed only at baseline*

Parenting-related stress was measured using the 10-item self-report questionnaire, Guilt About Parenting Scale (GAPS) (Haslam & Finch, 2016). This is a 7-point Likert scale assessment with answers ranging from 'Very Strongly Disagree' to 'Very Strongly Agree'. For example, "*I often worry I am not as good a parent as I should be*". Higher overall scores indicate more guilt about parenting (e.g. negative self-judgement about self as a parent) (Haslam, Divna, Filus & Finch, 2020). The scale shows good internal consistency (Cronbach's α = .89) and concurrent validity (correlation with general guilt subscale of Positive and Negative Affect Schedule, r = .64) (Haslam, Divna, Filus & Finch, 2020).

2-Way Social Support Scale (Shakespeare-Finch & Obst, 2011)
**Completed only at baseline*

To assess parents' experience of giving and receiving social support, the 2-Way Social Support Scale was used (Shakespeare-Finch & Obst, 2011). This is a 20-item self-report, using a 6-point Likert scale, from 'Not at all' to 'Always'. Higher scores indicate that parents feel they are giving and receiving high levels of social support. The measure demonstrates robust internal consistency (Cronbach's α = 0.878) and test-retest reliability (r = 0.69 to 0.73) (Shakespeare-Finch & Obst, 2011).

Other potential confounding variables were also collected, including parent mental health and education level, child age and developmental stage, and what previous treatment the child had received for EDs.

5.3.4.4 Information Provided by Clinicians

Clinicians were asked to provide some information from children's medical notes. These included median Body Mass Index (%mBMI) adjusted for age and gender at the three timepoints. They were asked about the child's ED diagnosis and their initial global EDE-QS score if the young person had not wanted to complete it again. Clinicians were also asked to confirm how many sessions of the parent group each parent had attended.

Note. Abbreviations in figure: *PRFQ* Parental Reflective Functioning Questionnaire; *AQ-10* Short Autism Spectrum Quotient; *3PS-SF,* Big Three Perfectionism Scale (Short Form); *GAPS* Guilt about Parenting Scale; *DERS* Difficulties in Emotion Regulation Scale; *RFQY-5* Reflective Function Questionnaire for Youth; *%mBMI* Percent Median Body Mass Index; *EDE-QS* Eating Disorder Examination – Questionnaire Short; *SCDC* Social and Communication Disorders Checklist; *DERS* Difficulties in Emotion Regulation Scale.

5.3.5 Patient and Public Involvement

A Qualtrics questionnaire outlining the research question, research aims and provisional methodology was sent to parents of children in recovery from an ED. There were nine respondents. All reported that they felt the research question was important and needed to be explored. All but one respondent reported that they would have taken part in the research if they were invited. The respondent who said they would not have done so reported that this was because they felt that taking part in a research project during their child's treatment would have "*added even more pressure to a difficult situation*". When asked if they would have been happy for their child to take part in the research project, seven respondents said yes, while one responded maybe and another responded no. When this was followed up, these two respondents reported that they would like their child to participate in research, but they felt that their child would not have agreed to take part and that they would not have wanted to upset their children.

From the responses, it was clear that parents would be happy to take part in research, but that the project needed to not be burdensome. While it was impossible to remove all burden from what is asked of the participants, I endeavoured to remove as much as possible by using questionnaires that are routine in clinical practice and that take a short amount of time for the participant to complete. I also contacted participants for each questionnaire session so that participants do not need to do anything in preparation for the sessions, aside from turning up. Participants had access to support from the clinical team and from myself if anything arose from the questionnaires that they needed support with – for example, if a child reported that the EDE-QS had made them feel distressed, thinking about their ED behaviours. Participants

were made aware throughout the research process that they had the right to withdraw at any time, without giving any reasons.

5.3.6 Procedure

Parents were invited to attend the parent group by their clinician, usually during the family assessment session at the beginning of treatment. Any parent who agreed to take part in the group was then invited to participate in the study in the initial week of the group, either by the clinician or by myself at the start of the first parent group session (I was invited to speak to each new group to give information about the study). Both parents of each child were invited to take part. Parents who were interested in the study were encouraged to either email me directly or to inform their clinician that they were happy to be contacted by me.

I organised an initial information session for each interested parent over Microsoft Teams, where parents were provided with an information sheet before they agreed to take part in the study. After assessing that the family was eligible to take part, parents were given a consent form to sign for themselves and their child. If their child also wanted to take part in the study, an information sheet and consent form was sent to them for their child to complete. Families were then given an identification number and emailed the first set of questionnaires to complete through Qualtrics. Families completed the questionnaires whilst on Microsoft Teams with me. This allowed for any questions about the study to be asked and allowed me to assess whether anyone felt distressed during the session. The questionnaires took roughly 10 minutes for children and 20-30 minutes for parents. Families were then invited to complete the questionnaire pack again in the same week as the final parent group session and roughly six weeks after the parent group has finished. Before the second and third questionnaire packs were completed, I spoke to the families to confirm that they were still able to take part in the study and that there were no problems arising from the questionnaires. While no parents declined to participate in the second and third parts of the study, there were a number of children who reported that they had found the questionnaires stressful and would not continue with the study.

5.3.7 Statistical Analysis

Data was analysed using SPSS, with t-tests and ANOVAs used for: change in reflective functioning (PRFQ subscales, RFQ-Y, DERS Lack of Emotional Clarity (child and parent)); emotion regulation (DERS (child and parent)); and child's %mBMI.

The sample sizes in both the adolescent and parent samples are small, increasing the risk of Type 2 errors (Field, 2013). Type 2 errors occur when a study fails to detect a true relationship or effect – the smaller the sample size, the more likely it is to occur. Therefore, one should be cautious when interpreting the study's results, particularly regarding the non-significant

Pearson's correlations. However, while these correlations may not be statistically significant, they can still provide valuable information about the strength and direction of the relationship between variables (Cohen, 2013; Funder & Ozer, 2019). In this case, non-significant correlations can be considered as effect sizes that help understanding of the magnitude of relationships between the variables being studied (Fritz, Morris & Richler, 2012; Gignac & Szodorai, 2016). Correlational analysis was used for: parent and child reflective functioning (PRFQ subscales and RFQ-Y; DERS Lack of Emotional Clarity, both adult and child); parent autistic trait score (AQ-10) and parent reflective functioning (PRFQ subscales); parent reflective functioning (PRFQ subscales) and child emotion regulation (DERS).

Within the regression model, the dependent variable(s) was a Change in Parental Reflective Functioning, calculated as the difference between first questionnaire session and final questionnaire session for PRFQ (all subscales). The predictor values that were planned for inclusion were baseline measures of child's ED severity (EDE-QS) and child and parent's autistic traits (AQ-10 and SCDC).

To assess whether changing a parent's ability to mentalise is associated with their child's clinical outcomes with regards to ED, I created a new variable called Clinical Outcome. There were only 11 adolescent participants who provided EDE-QS information at final data collection, reducing my ability to specifically assess the impact of mentalisation change on EDE-QS. Therefore, I calculated change between start of parent group and six-week follow-up for EDE-QS and for %mBMI. I then used these numbers to decide whether a participant had improved in outcome (Improvement) or had no improvement in outcome (No Improvement), creating a binomial variable. A binomial logistic regression was planned, with Clinical Outcome as the dependent variable, and Change in DERS Lack of Emotional Clarity and Change in PRFQ Certainty about Mental States as continuous predictor variables. However, due to the small sample size, it was decided that a chi-squared test was more appropriate.

5.3.7.1 Sample Size

Using a Cohen's d effect size of d = .46 calculated from previous studies assessing change on the PRFQ (Luyten et al., 2017), a minimum sample size of N = 31 (parents) was calculated (assuming 80% power and an alpha level of .05). Attrition rates are high in ED treatment, with a potential drop-out rate of nearly 40% (DeJong, Broadbent & Schmidt, 2012). When this is considered, the sample size calculation indicated that an appropriate minimum sample size of N = 52 was needed.

5.3.7.2 Missing Data and Multiple Imputations

Missing data for individual items on the self-report measures was very low since most questionnaires were completed online, with participants unable to submit their responses if items were missing. As I was responsible for data collection and speaking to parents and young people, it is clear that data was not missing at random. Looking specifically at the parent data, at Time 1, only one participant had missing data due to an incorrect completion. At Time 2, five parents were challenging to reach, resulting in missing data. During Time 3, again, difficulties in reaching some parents led to three missing responses. Notably, three parents who did not complete the survey at Time 2 returned for the final data collection. Shifting focus to the child data, there was a large amount of missing data due to young people not consenting to take part in the study. Parents reported that their child did not want to complete the questionnaires or that their child was not in a stable state of mind to complete questionnaires. It's worth noting that Time 3 had the highest dropout rate, with only 41% of the original participants providing data for EDEQS, RFQY-5, or Lack of Clarity. %mBMI data was obtained from clinicians, ensuring its completeness. Further details on the percentage of missing data can be found in Appendix 4.

To mitigate potential bias arising from large amounts of missing data, imputation was performed for the missing EDE-QS, RFQ-Y-5 and child DERS Lack of Emotional Clarity values. An automated imputation process was conducted using the SPSS software; specifically, the Fully Conditional Specification (FCS) method within SPSS was employed to manage missing values. This method generated a total of 5 imputations to enhance the completeness of the dataset. The imputation model for scale variables relied on Linear Regression. Specific constraints were established to define the roles of variables during the imputation procedure. Notably, variables baseline %mBMI and EDE-QS were considered as predictors only. These variables were chosen based on their potential association with the missing variables and their high completeness during the baseline assessment. Variables RFQY-5 (Time 1, 2 and 3), DERS Lack of Emotional Clarity (Time 1, 2 and 3) and EDE-QS (Time 2 and Time 3) were assigned roles as dependent variables, with no specified minimum or maximum values. This systematic imputation process ensured comprehensive handling of missing data, promoting data completeness for subsequent analyses. The imputed data demonstrated good alignment with the original non-imputed data, particularly around consistent trends of general improvement in variables like %mBMI and EDE-QS. Despite discrepancies in effect sizes and significance levels attributed to the larger sample size in the imputed data, its ability to reflect similar directional trends underscores its reliability in capturing overall patterns of change.

5.3.8 Ethical Approval

Few ethical issues were identified, as all the questionnaires are regularly administered to parents and children in mental health services. I tried to reduce the questionnaires to as few as possible to lessen the burden on participants at a time of increased stress in their lives; I repeatedly reminded both parents and children that they could withdraw at any time if they became distressed. Anonymity was achieved through use of ID numbers; confidentiality was maintained through the use of password protected files on an Imperial College London computer, and secure emails between myself and NHS Trusts.

We obtained approval from the South Central - Hampshire A Research Ethics Committee (REC) and Health Research Authority (HRA). The study also received confirmation of capacity and capability from each participating NHS Trust before accepting participants into the study or carrying out any research activity.

5.4 Results

5.4.1 Demographics

I recruited 38 parents of 27 adolescents to the study. Recruitment took place between November 2021 and January 2023. 38 parents completed measures at Time 1 (baseline) and 33 parents completed measures at Time 3 (six weeks post-parent group). There were 14 fathers and 24 mothers in the sample. Most parents were married (79%) and had been educated to at least undergraduate level (65%). Only two parents did not identify as White. For parent mental health, five reported that they were currently taking medication; 55% of parents reported that they had experienced mental health symptoms, currently or in the past.

In terms of the demographics of parents' children, nearly all children were diagnosed with Anorexia Nervosa (AN); one child was diagnosed with Avoidant Restrictive Food Intake Disorder (ARFID). The vast majority of children were female (93%), White (British 59%, Irish 4%, Other 26%) and had reached puberty (93%). According to parents, 74% of children had been ill for less than a year, although 10 of the children had received hospital care for their ED (e.g. emergency paediatric admission). Children were aged between 11 and 17 years old, with a mean age of 15.2 years (S.D. = 1.67).

For the adolescent sample, there were 18 participants at Time 1, 13 participants at Time 2 and 11 participants at Time 3. Five participants declined to complete the second set of measures; seven participants declined to complete the third set of measures. Two participants felt that the questionnaires were too triggering; the remaining participants did not give a reason for not wanting to continue in the study.

5.4.2 Descriptive Statistics

Cronbach's alpha was conducted for each of the baseline measures and their subscales to assess for internal consistency in this sample. Results are displayed in Appendix 5 for the parent sample and Appendix 6 for the adolescent sample. While internal consistency was very good for most of the parent scales (α > .7), internal consistency for PRF subscales varied greatly. For PRF Certainty about Mental States and PRF Interest and Curiosity, Cronbach's alpha was very good (α > .7); however, for PRF Pre-mentalising Modes, internal consistency was poor (α = .489). Removing question 10 "*My child sometimes gets ill to keep me from doing what I want to do*") only increased Cronbach's alpha to α = .550, which is still considered poor. For adolescent questionnaires, the RFQ-Y showed moderate internal consistency (α = .638). When question 1 was removed ("*I pay attention to my feelings"*), Cronbach's alpha improved greatly (α = .832). The DERS Subscale Lack of Emotional Awareness showed a very poor Cronbach's alpha (α = .034); this did not change when questions were removed, so this subscale was removed from further analysis.

Descriptive statistics for the parent baseline measures are shown in Table 5.1. From the results it appeared that, at baseline, parents were, on average, relatively good at mentalising about their child. A low mean score on the Pre-mentalising Modes subscale of the PRFQ suggests that parents were able to mentalise about their child appropriately (i.e. they can consider their child's perspective). The mean score on the Certainty about Mental States subscale of the PRFQ suggests that parents were neither hyper- nor hypo-mentalising. The high mean score on the Interest and Curiosity subscale of the PRFQ suggests that parents may have been overly interested in their child's thoughts and inner states. For the Lack of Emotional Clarity subscale on the DERS, the mean score was low, suggesting that parents are relatively certain about their own emotions. For the repeated measures (PRFQ and DERS Subscales), parent descriptive statistics are shown in Table 5.2. At each time point, the Certainty about Mental States subscale appeared to be normally distributed (Shapiro Wilk $p > .05$), as was the Interest and Curiosity subscale for Time 2 and Time 3. However, at baseline the data was not normally distributed (Shapiro Wilk $p < .05$). Additionally, for the Pre-mentalising Modes subscale and parent DERS Lack of Emotional Clarity subscale, the data was not normally distributed at any time point (Shapiro Wilk $p < .05$).

Table 5.1 Range, means and standard deviations of the baseline measures for parents.

			95% Confidence Interval				
		Mean	**Lower Bound**	**Upper Bound**	**S.D.**	**Min**	**Max**
Big Three Perfectionism Scale	Rigid Perfectionism	11.65	10.32	12.98	3.98	4	20
	Self-critical Perfectionism	16.59	14.99	18.20	4.81	9	29
	Narcissistic Perfectionism	8.73	7.41	10.05	3.96	5	19
Guilt About Parenting		45.62	42.31	48.93	9.93	22	65
2-Way Social Support Scale	Receive Emotional Support	1.80	1.53	2.07	.803	0	3
	Give Emotional Support	1.82	1.51	2.14	.940	0	3
	Receive Instrumental Support	1.88	1.62	2.14	.781	0	3
	Give Instrumental Support	1.82	1.54	2.09	.818	0	3
Autism Spectrum Quotient		3.05	2.36	3.75	2.09	0	8
Difficulties In Emotion Regulation Scale	Non-Acceptance of Emotional Responses	12.71	10.96	14.46	5.33	6	28
	Difficulty Engaging in Goal- Directed Behaviour	13.53	12.07	14.98	4.42	6	23
	Impulse Control Difficulties	11.45	10.19	12.71	3.84	6	19
	Lack of Emotional Awareness	16.84	15.35	18.34	4.55	8	26
	Limited Access to Emotion Regulation Strategies	16.21	14.38	18.04	5.57	8	32
	Lack of Emotional Clarity	10.45	9.37	11.52	3.28	6	20
	Total	81.18	74.53	87.84	20.24	49	141
Parental Reflective Functioning Questionnaire	Pre-Mentalising	1.84	1.58	2.11	.793	1	3.8
	Certainty about Mental States	3.64	3.25	4.03	1.16	1.33	6.17
	Interest and Curiosity	5.74	5.43	6.05	0.92	4	7

Table 5.2 Means and standard deviations of parent participant outcome measures at each data collection point.

			Start of Parent Group (Time 1)	End of Parent Group (Time 2)	Six Week Follow-up (Time 3)
Parental Reflective Functioning Questionnaire	**Pre-Mentalising Modes**	Mean	1.84	2.12	1.85
		S.D.	0.79	0.91	0.78
		N	37	33	35
	Certainty about Mental States	Mean	3.64	3.80	3.93
		S.D.	1.16	0.99	1.07
		N	37	33	35
	Interest and Curiosity	Mean	5.74	5.75	5.71
		S.D.	0.92	0.90	0.87
		N	37	33	35
Difficulties In Emotion Regulation Scale	**Non-Acceptance of Emotional Responses**	Mean	12.71	11.1	11.26
		S.D.	5.33	5.72	5.14
		N	38	33	35
	Difficulty Engaging in Goal- Directed Behaviour	Mean	13.53	12.67	12.63
		S.D.	4.42	5.10	5.16
		N	38	33	35
	Impulse Control Difficulties	Mean	11.45	10.55	9.97
		S.D.	3.84	4.14	3.20
		N	38	33	35
	Lack of Emotional Awareness	Mean	16.84	16.36	15.57
		S.D.	4.55	4.57	4.88
		N	38	33	35
	Limited Access to Emotion Regulation Strategies	Mean	16.21	15.82	15.14
		S.D.	5.57	5.69	5.21
		N	38	33	35
	Lack of Emotional Clarity	Mean	10.45	9.61	8.89
		S.D.	3.28	3.64	3.44
		N	38	33	35
	Total	Mean	81.18	76.1	73.46
		S.D.	20.24	22.7	19.80
		N	38	33	35

Descriptive statistics for the adolescent baseline measures are shown in Table 5.3. At baseline, adolescent participants reported high rates of ED behaviours (the cut-off point for problematic behaviour on the EDE-QS is 15 (Prnjak et al., 2020)), and the mean %mBMI suggests that, on average, adolescents were not at immediate risk of physical harm (with %mBMI >80% indicating “low” imminent mortality risk (Royal College of Psychiatrists, 2022)). Adolescents showed high levels of emotion dysregulation at baseline, but low levels of autistic traits. In terms of mentalisation, the mean score on the RFQ-Y suggests that adolescents had a moderate to good ability to mentalise. However, the mean score on the Lack of Emotional Clarity subscale of the DERS suggests that adolescents were uncertain about their emotions (higher scores reflect higher levels of alexithymia (Neumann et al., 2010). For the repeated measures (RFQ-Y, EDE-QS and DERS), adolescent descriptive statistics are shown in Table 5.4. For RFQY-5, EDE-QS and adolescent Lack of Emotional Clarity, the data was normally distributed at each timepoint (Shapiro Wilk $p > .05$).

Table 5.3 Range, means and standard deviations of the baseline measures for adolescents.

		95% Confidence Interval				
	Mean	**Lower Bound**	**Upper Bound**	**S.D.**	**Min**	**Max**
%mBMI	86.2	81.1	91.3	12	57.4	121.7
Eating Disorder Examination – Questionnaire Short	20.6	18.2	24.9	6.54	10	31
Social and Communication Disorders Checklist	8.26	5.50	11.0	6.98	1	25
Difficulties In Emotion Regulation Scale – Non-Acceptance of Emotional Responses	20.8	18.4	23.3	4.96	12	27
Difficulties In Emotion Regulation Scale – Difficulty Engaging in Goal- Directed Behaviour	19.5	16.8	22.2	5.39	6	25
Difficulties In Emotion Regulation Scale – Impulse Control Difficulties	20.2	17.4	23.0	5.63	10	30
Difficulties In Emotion Regulation Scale – Lack of Emotional Awareness	21.1	19.9	22.3	2.30	18	26
Difficulties In Emotion Regulation Scale – Limited Access to Emotion Regulation Strategies	30.3	27.0	33.5	6.49	17	38
Difficulties In Emotion Regulation Scale – Lack of Emotional Clarity	17.2	15.1	18.8	3.70	8	24
Difficulties In Emotion Regulation Scale – *Total*	128.9	118.3	139.5	21.2	84	161
Reflective Function Questionnaire for Youth	17.8	15.4	19.3	3.74	10	24

Table 5.4 Means and standard deviations of adolescent participant outcome measures at each data collection point.

		Start of Parent Group (Time 1)	End of Parent Group (Time 2)	Six Week Follow-up (Time 3)
%mBMI	Mean	86.2	89.7	91.1
	S.D.	12	8.83	10.8
	N	24	21	23
Eating Disorder Examination – Questionnaire Short	Mean	20.6	13.7	8.75
	S.D.	6.54	9.07	9.77
	N	27	27	27
DERS Lack of Emotional Clarity	Mean	17.2	17.1	15.9
	S.D.	3.70	3.80	4.81
	N	27	27	27
Reflective Function Questionnaire for Youth	Mean	17.8	18.6	19.2
	S.D.	3.74	2.79	2.93
	N	27	27	27

5.4.3 Correlational Analysis

5.4.3.1 Parent Mentalisation and Parent Baseline Variables

Table 5.5 displays the relationships between all the baseline variables, including each of the subscales of the PRFQ. There were significant positive correlations between PRFQ Pre-mentalising subscale, and DERS subscales Lack of Emotional Clarity (r = .285) and Impulse Control Difficulties (r = .406). There were non-significant, but moderate relationships between PRFQ Pre-mentalising subscale and DERS Total score (r = .256), 3PS-SF Narcissistic Perfectionism subscale (r = .241), and 2-Way Social Support Scale subscale Give Emotional Support (r = -.228). These results suggest that individuals who exhibit lower levels of pre-mentalising modes have better emotion regulation, lower levels of perfectionism, and are more likely to provide emotional support to others.

There was a significant positive correlation between PRFQ Interest and Curiosity subscale and 3PS-SF Rigid Perfectionism subscale (r = .291), and a significant negative correlation between PRFQ Interest and Curiosity subscale and DERS Lack of Emotional Clarity subscale (r = -.307). These results suggest that high interest in your child's mental states is associated with clarity about one's own emotions, but also with high levels of rigid perfectionism.

For the PRFQ Certainty about Mental States subscale, there was only one significant correlation: PRFQ Certainty about Mental States correlated negatively with GAPS (r = -.288). This suggests that the more certain a parent is about their child's mental states, the less guilt they experience as a parent. There were a number of non-significant, but moderate correlations between PRFQ Certainty about Mental States and other variables: there were positive relationships with 2-Way Social Support Scale subscales Give Emotional Support (r = .235) and Give Instrumental Support (r = .243), and negative relationships with 3PS-SF Narcissistic Perfectionism (r = -.244) and DERS subscales Difficulty Engaging in Goal-Directed Behaviour (r = -.227), Impulse Control Difficulties (r = -.256) and Lack of Emotional Clarity (r = -.261).

As well as correlations with the PRFQ subscales, DERS Lack of Emotional Clarity subscale was significantly negatively correlated with 2-Way Social Support Scale subscales Receiving Emotional Support (r = -.429) and Receiving Instrumental Support (r = -.422), suggesting that elevated symptoms of alexithymia are associated with reduced perceived social support from others. In terms of nonsignificant but moderate relationships, DERS Lack of Emotional Clarity was also positively associated with AQ-10 (r = .237) and 3PS-SF Self-critical Perfectionism (r = .236).

Table 5.5 Pearson correlations between parent baseline variables.

Baseline Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. PRFQ Pre-Mentalizing Mode	1												
2. PRFQ Certainty about Mental States	-.109	1											
3. PRFQ Interest and Curiosity in Mental States	-.481**	.360*	1										
4. AQ-10	.062	.035	-.254∞	1									
5. 3PS-SF Rigid Perfectionism	.190	.128	.291*	-.051	1								
6. 3PS-SF Self-Critical Perfectionism	.162	.015	.230∞	-.047	.487**	1							
7. 3PS-SF Narcissistic Perfectionism	.241∞	-.244∞	-.012	.015	.516**	.533**	1						
8. GAPS	-.056	-.288*	.231∞	-.060	.431**	.524**	.409**	1					
9. 2-Way Social Support Scale Receive Emotional Support	-.088	-.154	.110	-.024	-.014	-.211	-.032	-.077	1				
10. 2-Way Social Support Scale Give Emotional Support	-.228∞	.235∞	.255∞	.033	-.044	-.070	.029	-.051	.454**	1			
11. 2-Way Social Support Scale Receive Instrumental Support	-.173	-.106	-.136	.016	-.186	-.224	-.081	-.167	.697**	.373*	1		
12. 2-Way Social Support Scale Give Instrumental Support	-.208	.243∞	.175	.022	.072	.087	.086	-.035	.399**	.663**	.464**	1	
13. DERS Lack of Emotional Clarity	.285*	-.261∞	-.307*	.237∞	-.004	.236∞	.081	.220	-.429**	-.010	-.422**	-.131	1

**. Correlation is significant at the 0.01 level (1-tailed).
*. Correlation is significant at the 0.05 level (1-tailed).
∞. Correlation is approaching significance, p<.09.

Note. Abbreviations in table: *PRFQ* Parental Reflective Functioning Questionnaire; *AQ-10* Short Autism Spectrum Quotient; *3PS-SF,* Big Three Perfectionism Scale (Short Form); *GAPS* Guilt about Parenting Scale; *DERS* Difficulties in Emotion Regulation Scale.

5.4.3.2 Child Mentalisation and Child Baseline Variables

Table 5.6 displays the relationships between all the baseline variables. RFQ-Y had no significant correlations; however, it is worth noting that RFQ-Y did have weak to moderate correlations with age in years and DERS Lack of Emotional Clarity. For %mBMI, there was a significant and strong positive relationship with EDE-QS. There was a moderate, negative non-significant relationship between %mBMI and SCDC, and a strong, positive non-significant relationship between %mBMI and DERS Lack of Emotional Clarity. Finally, EDE-QS was negatively, but not significantly, weakly correlated with SCDC, suggesting that higher levels of ED symptoms are associated with higher levels of parent-reported autistic traits.

Table 5.6 Pearson correlations between adolescent baseline variables.

Baseline Variables	**1**	**2**	**3**	**4**	**5**	**6**
1. RFQY-5	1					
2. AGE	.213	1				
3. %mBMI	.127	-.095	1			
4. EDE-QS	.113	.033	.519*	1		
5. SCDC	.167	-.038	-.279	-.166	1	
6. DERS Lack of Emotional Clarity	.201	.186	.343	.216	-.047	1

**. Correlation is significant at the 0.01 level (1-tailed).
*. Correlation is significant at the 0.05 level (1-tailed).

Note. Abbreviations in table: *RFQY-5* Reflective Function Questionnaire for Youth; *%mBMI* Percent Median Body Mass Index; *EDE-QS* Eating Disorder Examination – Questionnaire Short; *SCDC* Social and Communication Disorders Checklist; *DERS* Difficulties in Emotion Regulation Scale.

5.4.3.3 Parent Mentalisation and Child Baseline Variables

Baseline PRFQ and parent DERS Lack of Emotional Clarity subscale were correlated against their child's scores on variables including %mBMI and ED symptomatology, to explore factors that may be important for a parent's ability to mentalise about a child with an ED. These results are displayed in Table 5.7.

%mBMI did not correlate significantly with any parent variable, although there was a moderate, negative correlation with adult autistic traits. EDE-QS did not correlate significantly with any parent variable, although there was a positive, moderate correlation with PRF Certainty about Mental States. There was a negative, moderate and significant correlation between child autistic traits and PRF Certainty about Mental States and PRF Interest and Curiosity in Mental States. Additionally, the moderate, positive relationship between SCDC and PRF Pre-Mentalising Modes was approaching significance.

5.4.3.4 Parent Mentalisation and Child Mentalisation

It was hypothesised that mentalisation ability would correlate between parents and their children. Scores on the three subscales of the PRFQ and the parent's DERS subscale Lack of Emotional Clarity were correlated against their child's RFQ-Y and DERS subscale Lack of Emotional Clarity scores (Table 5.7).

There were no significant or noteworthy correlations between parent DERS Lack of Emotional Clarity, and the RFQ-Y or child Lack of Emotional Clarity. For PRFQ, there were no significant correlations, but for RFQ-Y there was a positive, moderate correlation with PRFQ Interest and Curiosity in Mental States subscale, and for child Lack of Emotional Clarity there was a negative, moderate correlation with PRFQ Interest and Curiosity in Mental States subscale.

Table 5.7 Pearson correlations between parent baseline mentalisation measures and adolescent baseline variables scores.

Adolescent Baseline Variables	***Parent Mentalisation Measures***				
	PRF Certainty about Mental States	PRF Interest and Curiosity in Mental States	PRF Pre-Mentalizing Modes	DERS Lack of Emotional Clarity	AQ-10
%mBMI	-.032	-.173	.088	-.110	-.226
SCDC	-.322*	-.288*	.247∞	.151	-.002
EDE-QS	.298	.166	-.191	-.219	-.061
RFQY-5	-.003	.223	-.022	-.043	-.100
DERS Lack of Emotional Clarity	.060	-.255	.024	.047	.102
Age (years)	-.040	.051	-.211	.176	.131

**. Correlation is significant at the 0.01 level (1-tailed).
*. Correlation is significant at the 0.05 level (1-tailed).
∞. Correlation is approaching significance, $p < .09$.

Note. Abbreviations in table: *PRFQ* Parental Reflective Functioning Questionnaire; *DERS* Difficulties in Emotion Regulation Scale; *AQ-10* Short Autism Spectrum Quotient: *RFQY-5* Reflective Function Questionnaire for Youth; *%mBMI* Percent Median Body Mass Index; *EDE-QS* Eating Disorder Examination – Questionnaire Short; *SCDC* Social and Communication Disorders Checklist.

5.4.4 Change over Time

5.4.4.1 Parent Mentalisation

Means, participant numbers and standard deviations for PRFQ subscales and for DERS subscale Lack of Emotional Clarity at start of parent group (baseline), end of parent group and six-week follow up are displayed in Table 5.2.

When visualising the data, it became clear that the baseline scores on the PRFQ subscales Pre-mentalising Modes and Interest and Curiosity, and on the DERS Lack of Emotional Clarity subscale, were skewed – parents showed very low scores on the Pre-mentalising Modes subscale and the Lack of Emotional Clarity subscale, and very high scores on the Interest and Curiosity subscale. Additionally, when looking at the raw data, for the Certainty about Mental States subscale of the PRFQ, there appeared to be two groups of parents: parents with low scores at baseline had an increase in their scores, while parents who had high scores at baseline stayed stable (see Appendix 7).

To account for this, I conducted a median split on each subscale to create new categories of scores (Below Median and Above Median). Using two-way mixed ANOVAs, I assessed whether parent mentalisation changed between baseline, end of parent group and six-week follow up, and whether change was dependent on being below or above the baseline subscale median.

For the PRFQ, there was no significant change on the Pre-mentalising Modes subscale ($F (2, 58) = 1.53$, $p = .225$) or on the Interest and Curiosity subscale ($F (2, 58) = .211$, $p = .811$). There was significant change on the Certainty about Mental States subscale: parents became more certain ($F (2, 58) = 3.15$, $p = .05$, $\eta_p^2 = .098$). There was a significant interaction between timepoint and median split category ($F (2, 58) = 3.91$, $p < .05$, $\eta_p^2 = .119$). Pairwise comparisons suggested that parents with a score below the median became more certain between start of parent group and end of parent group ($p < .05$), and between start of parent group and six-week follow up ($p < .05$). However, for parents whose baseline score was above the median, there was no significant change over time.

For the DERS Lack of Emotional Clarity subscale, there was a significant decrease ($F (2, 60) = 7.38$, $p < .001$, $\eta_p^2 = .197$). Pairwise comparisons suggest that parents developed more clarity about their emotions between the start of parent group and the end of parent group ($p < .05$) and between the start of parent group and six-week follow up ($p < .05$). There was no interaction between timepoint and median split category ($F (2, 60) = 1.27$, $p = .288$).

5.4.4.2 Child Mentalisation and Clinical Outcomes

Means, participant numbers and standard deviations for %mBMI, EDE-QS, RFQ-Y and DERS subscale Lack of Emotional Clarity at start of parent group (baseline), end of parent group and six-week follow up are displayed in Table 5.4.

Due to small sample sizes for the adolescent sample, paired samples t-tests were performed between baseline and six-week follow-up (i.e. first and last set of questionnaires), rather than the planned repeated-measures ANOVAs. There was change on the RFQ-Y: adolescents' mentalisation significantly improved ($t(26) = -2.5$, $p < .05$, Cohen's $d = .727$). There was a significant change in EDE-QS which decreased through the study ($t(26) = 2.12$, $p < .005$, Cohen's $d = .276$). There was also significant change in %mBMI, with a general improvement ($t(21) = 2.18$, $p < .05$, Cohen's $d = .464$). There was no significant change on the DERS Lack of Emotional Clarity subscale ($t(26) = .34$, $p = .74$).

5.4.5 Predicting Clinical Outcomes

By six-week follow-up, 15 adolescents had showed improvement, compared to 10 who had showed no improvement. There was no statistically significant relationship found between the categorical variable PRFQ Certainty Change (Change vs No Change) and Clinical Outcome (Improvement vs No Improvement) ($\chi^2 = 1.42$, $p = .234$). There was no statistically significant relationship found between the categorical variable Parental DERS Lack of Emotional Clarity Change (Change vs No Change) and Clinical Outcome (Improvement vs No Improvement) ($\chi^2 = .09$, $p = .763$).

5.4.6 Predicting Change in Parent Mentalisation

It was predicted that certain variables would predict how parent mentalisation changes at the start of a child's ED treatment, including level of autistic traits. A linear regression analysis was conducted with the dependent variable Change in PRFQ subscale Certainty about Mental States, and the predictor variables, children's autistic traits (SCDC), ED severity (EDE-QS) and mentalising ability (RFQ-Y). The model predicted 29.8% of the variance in the dependent variable. The ANOVA results suggest that the regression model was not statistically significant ($F(3, 13) = 1.84$, $p = .190$). Only RFQ-Y had a significant negative standardised coefficient ($\beta = -1.99$, $p < .05$), indicating that better mentalising scores amongst adolescents is associated with lower levels of change in parents' certainty about their child's mental states.

5.5 Discussion

5.5.1 Overview of Results

My analysis aimed to examine whether parent mentalisation changes through a short, parent-focused group intervention and what predicts this change. I found that some aspects of parent mentalisation did change through the course of the study: parents became more certain, both about their own mental states (measured using DERS Lack of Emotional Clarity subscale) and their child's mental states (measured using PRFQ Certainty about Mental States subscale). Importantly, the change on the PRFQ Certainty about Mental States subscale only occurred for parents with a baseline score below the group median. There was no change in terms of parents' use of pre-mentalising modes or parents' interest and curiosity in their children's mental states.

Another aim of the study was to assess whether there was any change in adolescent outcomes through the study, and whether change in PRF predicted any change in outcomes. There was a significant increase on the RFQ-Y, suggesting that overall levels of mentalisation improved in the early stages of treatment. Additionally, there was a significant reduction on the EDE-QS and a significant improvement in %mBMI, suggesting that ED severity improves early in treatment, both in terms of psychological and behavioural symptoms, and physical health. I compared the variables Change in PRFQ and Change in Lack of Emotional Clarity, with Clinical Outcome, where adolescents were assessed as Improved or Not Improved. There was no significant relationship between change in parent mentalisation and children's clinical outcomes at six-week follow-up, suggesting that improvement in parent mentalisation is not the direct process by which clinical improvement occurs.

The final aim was to explore what factors predict change in parent mentalisation. I examined the relationships between various baseline variables, both parents' and adolescents', and parent mentalisation variables to understand if there were any variables that may predict change. Due to the small sample, there is not enough power to make firm conclusions about these relationships, but exploratory analysis suggests that a parent's certainty about their mental states was negatively associated with guilt about parenting, emotion dysregulation and narcissistic perfectionism. Parent's lack of emotional clarity was positively associated with autistic traits and self-critical perfectionism. Certainty about mental states, both of themselves and of their child, was associated with giving and receiving social support.

There was no correlation between baseline %mBMI and a parent's certainty about mental states. However, there was a significant, moderate negative correlation between children's autistic traits and parents' certainty about their child's mental states, suggesting that parents' ability to mentalise about their child is higher if they report that their child has low levels of

autistic traits. Additionally, there was a significant, moderate negative correlation between children's autistic traits and parents' interest and curiosity in mental states, suggesting parents are less curious about their child's mental states if they exhibit high levels of autistic traits. While there was no significant correlation between ED severity and parents' mentalisation scores, the correlations were moderate: higher child ED severity is associated with higher parent certainty about their child's mental state. This suggests that when their child was very unwell, parents were less able to mentalise.

These relationships were then considered for inclusion in linear regression, examining what predicts parental change: child's autistic traits and ED severity did not significantly predict change in parents' certainty about their child's mental states. However, it appears that baseline RFQY-5 might predict change in PRFQ scores, as the coefficient was significant and negative.

5.5.2 Synthesis with the Literature

The results suggest that there is a complex relationship between parents' mentalisation ability, adolescents' ability to mentalise and adolescents' clinical outcomes. Parents became more certain and clearer about mental states through the first 12 weeks of their child's outpatient treatment. Not only did they become more certain about their child's mental states, but they also became clearer about their own mental states. However, only parents with low scores at baseline became more certain about their child's mental states; for those parents with relatively high scores at baseline, mentalising ability did not change. This improvement in a specific sub-group of the sample suggests that it might be important for certain parents to become relatively certain about their child's mental states through the early stages of treatment. Discussion with both clinicians and parents suggest that this may indeed be the case: one psychologist I spoke with talked about working with parents who deliberately prevented themselves from attempting to understand their child's mental states in the early stages of treatment to feel emotionally able to implement refeeding plans. Qualitative analysis has suggested that parents report that this first stage of treatment feels the hardest, needing to stand their ground despite their child's distress at mealtimes (Thibault et al., 2023); parents report that trying to get their child to eat can feel like force-feeding, and they were often met with verbal and physical violence (Williams, Wood & Plath, 2020). Becoming actively more certain about mental states may allow parents to protect themselves from over-empathising with their child's ED cognitions and regulate their own emotions in response to their child's distress, allowing parents to better support their child's recovery. This would also correspond with results from the original examination of the Surrey Early Intervention Parent Group, which demonstrated that parents' confidence in supporting their child's recovery increases during the group (Nicholls & Yi, 2012) and evidence that parent mentalisation is associated with feelings of competence (Manshadi, Fallah & Chavoshi, 2023).

While I had theorised that a change in parent mentalisation would predict better treatment outcomes for adolescents, this did not appear to be the case. Neither PRFQ nor DERS Lack of Emotional Clarity was associated with whether adolescents improved or not at the end of 12 weeks. While theory would suggest parental mentalising may be important (see Chapter 4), these results align with those of my previous study (see Chapter 3) suggesting that change in parent mentalisation is unlikely to be an important mechanism linked to clinical improvement. Equally, recent evidence from another community sample reported that there may be no identifiable parent factors that predict early weight gain in the first 8 weeks of outpatient treatment (Hamadi et al., 2020), which echoes the current findings. In my study, of the 24 adolescents categorised for the variable Clinical Outcome, 16 showed improvements in ED severity and physical health, with 4 showing no change and 5 showing a small deterioration of symptoms. This is encouraging, as previous evidence suggests that the first 12 weeks of treatment are integral to good treatment outcomes (Austin et al., 2021; Chang, Delgadillo & Waller, 2021; Vall & Wade, 2015). It is also encouraging because it suggests that while change in parent mentalisation does not predict clinical improvement, it also does not predict clinical deterioration. The increased certainty of parents regarding mental states does not appear to yield the adverse consequences that may be expected if excessive levels of parent certainty are damaging for children, as has been suggested previously (Jewell et al., 2021).

Examination of the baseline factors demonstrated that parents of adolescents who report higher levels of ED severity may be more certain about their child's mental states. This suggests that parents may be relying more on assumptions or preconceptions about their child's mental states when their child is struggling more with an ED, rather than gathering and processing new information about their child's actual experiences and emotions (Luyten et al., 2017). Equally, adolescents who are better at understanding and reflecting on the mental states of themselves and others at the beginning of ED treatment have parents who are more interested and curious about their child's mental states. This may be because these children are more able to communicate their thoughts and feelings to their parents directly, reducing the need for parents to make assumptions or rely on guesswork. Additionally, the linear regression suggested that adolescents with better mentalising ability at the beginning of treatment may not require their parents to become more certain about their mental states through the early stages of treatment. It is possible that this is because these adolescents are better able to communicate their experiences to their parents and so their parents may be more confident in their child's ability to manage their own thoughts and emotions.

There was no correlation between adult autistic traits and scores on the Pre-mentalising and Certainty about Child's Mental States subscales, but there was a moderate, non-significant

negative correlation between adult autistic traits and Interest and Curiosity subscale, and a moderate, non-significant positive correlation between adult autistic traits and Lack of Emotional Clarity. These results suggest that in parents, higher autistic traits are related to more uncertainty about one's emotions and reduced interest in their child's inner world. In adolescents, autistic traits were significantly negatively correlated with PRF (Certainty about Child's Mental States and Interest and Curiosity subscales), but not with lack of emotional clarity in either parents or adolescents, or adolescent overall mentalisation (RFQ-Y). These results suggest that, for adolescents with high levels of autistic traits, parents are more uncertain about their child's mental states and exhibit reduced interest in their child's inner world. Combined, these results fit with previous research suggesting that mentalisation about others is harder for individuals with more autistic traits, and it is harder to mentalise about others if they display more autistic traits (Ansari, McMahon & Bernier, 2020). Finally, contrary to the hypothesis that autistic traits could impact how much mentalisation can change, in this sample, autistic traits did not predict change in parent mentalisation. This result suggests that interventions aimed at improving PRF could be as effective with parents with ASD as they are with parents without ASD.

While parent scores did increase significantly on the PRFQ Certainty about Mental States subscale, it is important to note that the change was small, even for those with low levels of certainty at baseline; these results compare with those seen in Chapter 3. The median score for the entire sample sits close to the midpoint of the scale at baseline, and this increased to just above the midpoint by the end of the study (see Table 5.2.). These findings suggest that while parents do become more certain about their child's mental states, they do not reach excessive levels of certainty. The original authors of the PRFQ (Luyten et al., 2017) have suggested that excessive parental certainty may reflect hyper-mentalising or intrusive mentalising, which could limit parents' ability to respond sensitively to their child's emotional needs (Luyten et al., 2017). Conversely, low scores on the subscale may indicate hypo-mentalising, a near-complete lack of parental certainty about their child's internal states, which has also been implicated in poor parental understanding of their child's inner experiences. Therefore, the PRFQ's authors suggest that moderate levels of parental certainty, around the midpoint of the scale, are optimal (Luyten et al., 2017). In the current sample, the increase in certainty scores for the Below Median group brought them to a near midpoint, slightly below the median at baseline. These findings suggest that the intervention may have helped parents achieve a more balanced and adaptive approach to understanding their child's mental states. This suggestion fits with what has been shown in similar studies with different parent samples: scores on the Certainty about Mental States subscale increase through a parent group intervention, but not to the point of excessive certainty (Donnelly et al., 2023); this change has

been implicated in a variety of positive outcomes for children. While change in certainty did not directly predict clinical outcome in the current sample, further research is warranted to investigate the implications of parents reaching optimal levels of mentalisation.

My results highlight the potential indirect relationships between parental certainty, adolescent mentalisation, and clinical outcomes in the treatment of EDs. While there was no direct relationship between changes in parental certainty, as measured by the PRFQ or the DERS Lack of Emotional Clarity, and adolescent ED outcomes, the findings suggest a complex relationship between these factors. Specifically, higher baseline scores on the RFQ-Y, indicating better adolescent mentalisation, were associated with a smaller amount of change in parental certainty. This indicates that parents may not need to adjust how certain they are about their understanding of their child's inner experiences when their child exhibits good mentalising ability. Although the sample size was too small to conduct mediation analysis or examine if changing adolescent RFQ-Y scores predict outcomes, it is possible that there is an indirect relationship between adolescent mentalisation, parent mentalisation, and clinical outcomes of ED treatment. For example, previous research has shown that the therapeutic relationship is associated with child mentalisation, and a good therapeutic alliance predicts positive clinical outcomes for adolescents with EDs (Jewell et al., 2021). It is plausible that the therapeutic relationship serves as a mediator between parent and child mentalisation and clinical outcomes. Further research amongst bigger samples of parents and adolescents is, over longer periods of time, necessary to fully elucidate these relationships.

5.5.3 Strengths and Limitations

The study had a number of notable strengths that enhance its scientific rigour. There was a low attrition rate, with only three parents failing to complete the final questionnaires. This is particularly important in longitudinal studies as high rates of attrition can introduce bias to findings and limit their interpretability (Saiepour et al., 2019). Additionally, the measure used to assess parent mentalisation was specifically focused on the parent's ability to mentalise about their relationship with their child, rather than just the parent's ability to mentalise about themselves, or generally about others. Mentalisation is relationship-specific, with evidence that parents can mentalise differently about different children (Ansari, McMahon & Bernier, 2020); by using a questionnaire that assesses children's mental states, the results capture important information about interactions between parents and adolescents with EDs, and the impact of parental mentalisation on child outcomes. These strengths can help to increase the validity and reliability of the results, providing useful insights into the relationship between parent mentalisation and childhood EDs.

The primary limitation of the study was the relatively small sample size. Originally, I had intended to recruit 30 to 50 parents, and data was ultimately gathered from 38, with 35 parents completing questionnaires at each time point, so achieving the minimum sample size, but limiting the amount of statistical analysis that could be conducted. In terms of the adolescent sample, the number of participants was limited to 17 at baseline, with only 11 adolescents completing all three sets of questionnaires, resulting in the use of multiple imputation to reduce bias. This small sample of adolescents with complete data makes drawing inferences about the relationship between PRF and clinical outcomes less definitive. There were several barriers to recruitment. Firstly, the number of eligible families for the parent group was small, with each group consisting of between three and ten families per six-week round, and only a couple of these families ultimately agreeing to participate. Moreover, due to the extended length of the rounds, recruiting even to the modest sample size of 38 required a significant amount of time. Given that this study was conducted as part of my PhD research, I had limited time available for participant recruitment and had to adhere to strict PhD deadlines, which further complicated the recruitment process. If the study were to be repeated, it would be advisable to extend the recruitment period from one year to three years, allowing ample time to collect a larger sample.

A very significant issue with data collection was the COVID-19 pandemic. ED services saw a huge rise in referrals (Hyam et al., 2023), and waiting times for treatment increased dramatically (Iacobucci, 2021). The patients who were being seen were also presenting with higher acuity and services began triaging referrals so that the highest-risk patients were prioritised; hospitalisation was common (Nicholls, 2022). Community services were over-subscribed, and staff felt huge pressure to reduce waiting lists and provide care to families; staff burn-out has been suggested as a reason for the high staff turnover experienced by many services (Nicholls, Dasha, 2022). Unfortunately, this had a huge impact on services' ability to provide the parent group. Multiple services that had been running the group regularly before the pandemic were forced to either stop the group completely or reduce the number of sessions that were run. Even the services that were running the group as normal were reluctant to take part in the study. Staff reported that they did not have the time or the resources that would be needed to aid participant recruitment. The result of these factors was that there were fewer participant recruitment sites than expected, reducing my ability to recruit families. Parents were also reluctant to take part in the study because of the severity of their child's illness. Due to the COVID-19 pandemic, many families were waiting for much longer to receive any type of ED treatment than is normally expected (NHS England, 2015; Nicholls, 2022). This meant that many adolescents were experiencing more severe symptoms by the time their parents were invited to the parent group. Parents felt that they therefore did not have

the time to commit to the study, and some reported that they did not feel comfortable taking part while their child was so unwell, as they felt that their child would not consent to them taking part. These factors added to my difficulties in recruiting parents, but it also meant that the sample is potentially biased towards parents of children with less severe symptoms, and those parents who felt that they had more time to take part (e.g. parents whose child was still attending school regularly).

The study participants were predominantly White and middle class, with a notable under-representation of non-White families. While some non-White families did participate in the parent groups, there was a noticeable reluctance among them to engage with the study. The reasons for this reluctance were not entirely clear, with some staff suggesting that language barriers may have played a role, while others suggested that cultural stigmas surrounding mental health may have contributed. This sense of shame could potentially extend to reluctance to participate in research, as there may be concerns regarding confidentiality and anonymity. Given that EDs can affect individuals from all backgrounds, it is critical to understand how to encourage non-White families to participate in future research investigating changes in parental mentalisation. Furthermore, the skewed sample is another limitation of the study, as only a small fraction of approached parents ultimately chose to take part. As a result, any conclusions derived from the study can only be generalised to the specific population of parents who are willing to engage with research.

The small sample size of the study not only poses problems for the generalisability of the results, but it also restricted the statistical power of the study, increasing the risk of making Type 2 errors. Initially, to perform repeated measures ANOVAs, I had planned to recruit between 30 and 50 parents to participate, which was achieved. However, the adolescent sample posed challenges due to having only 11 participants who completed the RFQ-Y and EDE-QS at each time point; while multiple imputation was to reduce bias and estimate missing data, the statistical tests were still only based on 27 participants. Given the small sample size, a t-test was a more appropriate statistical test, as it requires fewer assumptions and is better able to estimate within-subjects variance (Sullivan & Feinn, 2012). Even with t-tests, the statistical power for RFQ-Y, EDE-QS and DERS Lack of Emotional Clarity is likely to be low). Additionally, the small sample size limited the ability to detect significant correlations, as evidenced by the non-significant but relatively large correlation coefficients for parent scores on the PRFQ subscale Interest and Curiosity with adolescent scores on the RFQ-Y ($r = .223$) and on the child DERS Lack of Emotional Clarity subscale ($r = -.255$) (Sullivan & Feinn, 2012). It is important to consider effect sizes in addition to statistical significance when interpreting results, particularly with small sample sizes where the latter may be unreliable. Indeed, some researchers suggest that effect sizes are more important than statistical significance because

they provide a quantitative measure of the magnitude of the relationship between variables, while statistical significance is dependent on sample size and can be influenced by factors such as alpha level and multiple comparisons (Cumming, 2013; Cumming, 2014). Therefore, caution is warranted when interpreting non-significant results in this study, and future studies with larger sample sizes are needed to confirm and extend my findings.

The main aim of the study was to assess whether parent mentalisation changes quickly for parents of children receiving outpatient ED treatment. I chose six weeks after the parent group finished to collect the final questionnaires as this would mean that families had been receiving support for roughly 12 weeks. Previous research has suggested that change in various aspects in the first three months are crucial for overall prognosis (Austin et al., 2021; Chang, Delgadillo & Waller, 2021; Vall & Wade, 2015). However, some could argue that 12 weeks is not long enough to assess whether a cognitive skill like mentalisation can change quickly. Equally, it may be that change in parent mentalisation may not predict change in children's outcomes early on in treatment, but it could predict children's outcomes over a longer time period. For example, a previous study examining predictors of children's clinical outcomes found that parental certainty predicts poor treatment outcome at 9 months (Jewell et al., 2021). In future replications of this study, I would therefore increase the follow-up period, collecting final questionnaires at 9-12 months after the parent group finishes.

When I first proposed the idea for this study, most of the groups were being run in person at the ED service. However, because of the COVID-19 pandemic, all of the groups moved online and have remained online. Being online meant that more parents were able to access the group, as they did not need to travel to the outpatient centre and could join the group from their workplace. While this is an obvious strength in regard to reaching more parents, it is unclear whether the full benefits of the group are experienced when the group is online, and how this might affect outcomes. Parents have previously reported that the benefits of a group intervention are often due to the social interaction aspects, which are less possible when a group is conducted online. Future research should focus on assessing whether parents experience an online parent group in the same way as an "offline" group, and what impact there is on both parent and child outcomes.

One potential limitation for the study may come from the sole use of self-report questionnaires to measure parent and adolescent mentalisation. While self-report measures can provide valuable information about mentalisation, they may not capture the complexity and nuances of this cognitive ability, which may be better assessed with interviews or more interactive assessments. Questionnaires rely on a participant's ability to accurately report on their own thoughts and feelings, which will be subject to biases. Observer-rated interviews, conversely, can provide a more comprehensive and dynamic picture of participant abilities by allowing for

follow-up questions, clarification and exploration of different perspectives. Use of multiple styles of assessment would be ideal when assessing change in mentalisation, to establish a clearer picture. However, the gold standard interview assessments used for mentalisation (e.g. the Reflective Functioning Scale (RFS) (Fonagy et al., 1998) applied to the Parent Development Interview (PDI) (Sleed, Slade & Fonagy, 2020) or Adult Attachment Interview (AAI) (George, Kaplan & Main, 1996)) are time-consuming and require significant training to administer, which I was unable to do during the period of my PhD. However, for a few participants towards the end of data collection, I was able to collect some qualitative data. The Five-Minute Speech Sample (FMSS) is a tool used to evaluate psychological states through the analysis of speech content (Gottschalk & Gleser, 1979; Sher-Censor, 2015). Participants are requested to speak on a specific subject for a duration of five minutes without any verbal cues from the researcher. In the case of parent mentalisation, parents are instructed to talk about their child for the entire five minutes, as described by Adkins, Luytens & Fonagy (Adkins, Luyten & Fonagy, 2018; Adkins et al., 2022). I recorded parents talking about their child at the start of the parent group and at the end of the parent group; in time these transcripts will be scored using the FMSS, and I will then compare the scores against the parents' scores on the PRFQ. It is hoped that this will provide a more comprehensive overview of parents' ability to mentalise about their child.

5.5.4 Future Directions

While the limitations outlined may restrict the scope of conclusions we can draw from the results, there are clear implications for future research. Past studies have suggested that enhancing a parent's mentalising ability can have a positive impact on their child's clinical outcomes (Donnelly et al., 2023). However, the present findings indicate that, for parents of children with EDs, there appears to be no direct link between improving parent mentalisation and better outcomes in terms of ED severity and physical health. Nonetheless, the results do suggest that an adolescent's mentalising ability can predict changes in their parents' abilities, implying that there is a relationship between parent and child mentalisation. The next step would be to explore other child and parent factors that may predict changes in mentalising ability and clinical outcomes. It is possible that, although changing parent mentalisation does not directly affect a child's health, there may be indirect relationships. For example, it could be hypothesised that enhancing parental mentalisation may improve attachment security, which is linked to better mental health outcomes in adolescents (Allen et al., 2018). Alternatively, therapeutic alliance has been shown to predict positive treatment outcomes for adolescents with EDs (Jewell et al., 2021) and is linked to mentalising ability (Fonagy, Peter & Allison, 2014). Therefore, it may be that improving mentalisation in both parents and adolescents enhances therapeutic alliance in family therapy, indirectly predicting clinical outcomes.

Although the current analysis provides a simple assessment of change over time of various measures by comparing scores at two time points (beginning of parent group and six-week follow-up), more sophisticated methods could capture the complexity of change more accurately. For example, a latent change score model would allow us to model the difference between two latent variables, which represent the underlying construct of interest (e.g., mentalisation or clinical outcome), while accounting for measurement error (Klopack & Wickrama, 2020; McArdle, 2009). This approach can be particularly useful when there are multiple indicators of the construct that can be measured at each time point. On the other hand, a growth curve model would allow us to model the trajectory of change over time, capturing the rate of change rather than just the difference between two points (Curran & Hussong, 2009; Peugh, 2010; Singer, Willett & Willett, 2003). This approach can be used to examine individual differences in rates of change, investigate the effects of predictors on change over time, and estimate the point at which change is no longer significant. However, a growth curve model may require more data points than a latent change score model, and may be more sensitive to missing data (Singer, Willett & Willett, 2003). If the study was to be repeated, a larger sample size should be recruited to be able to implement these statistical methods.

While the current study found that overall parent mentalisation did not appear to directly predict changes in health outcomes for children with EDs, it is important to consider that different aspects of mentalisation may have varying impacts. For instance, research has shown that empathy, theory of mind, and alexithymia are all components of mentalisation that can have unique effects on well-being (Allen, Fonagy & Bateman, 2008; Fonagy, Gergely & Jurist, 2018). Thus, it is possible that specific aspects of parent mentalisation could be more closely linked to positive health outcomes for children with EDs than others. Future research should therefore consider examining the individual components of mentalisation in relation to outcomes in this population. Additionally, using a variety of different measures, including observer-rated interviews and behavioural observations, will improve the ability to examine separate components of mentalisation. Such research could provide a more nuanced understanding of the ways in which parent mentalisation affects child development and may have important implications for the design of interventions aimed at improving parent mentalisation in this population.

It is also important to consider that mentalisation itself is influenced by a range of factors. For example, a parent's own mental health can impact their mentalisation abilities, as well as their children's mentalisation abilities (Slade, 2005). Additionally, parents' attachment with their own parents may also be relevant to their mentalisation abilities, and ultimately, the health outcomes of their children; parents who had secure attachment experiences with their own

parents may be more likely to be sensitive to their children's mental states and to have better mentalisation abilities (Camoirano, 2017; Mikulincer & Shaver, 2010; Slade et al., 2005; Slade, 2005). Parents who experienced insecure attachment with their own parents may struggle with mentalisation and have a higher risk of transmitting insecure attachment patterns to their children (Mikulincer & Shaver, 2010). Therefore, it is important for future studies to explore the role of parental mental health as a potential moderator of the relationship between parent mentalisation and child clinical outcomes, as well as the impact of intergenerational transmission of attachment styles and mentalisation abilities on both parent and child clinical outcomes.

The aim of the Surrey Early Intervention for Child and Adolescent Eating Disorders parent group is to enhance early treatment response, by helping parents put themselves in their child's shoes and improve parent-child communication (Nicholls & Yi, 2012) and not to improve mentalisation specifically. Other interventions, such as Video-feedback Intervention to promote Positive Parenting (VIPP) (Juffer, Bakermans-Kranenburg & Van Ijzendoorn, 2008; Juffer et al., 2017) are more targeted to this purpose. VIPP is a parent-training programme based on attachment theory that aims to promote positive parenting practices and enhance parent-child interactions, using video feedback: the therapist records interactions and then reviews these with parents, to promote insight into their behaviours, strengths and areas for improvement (Juffer, Bakermans-Kranenburg & Van Ijzendoorn, 2008; Juffer et al., 2017). The intervention is relatively new, but a meta-analysis has already suggested that the technique is successful at improving parents' attitudes and behaviours, as well as child attachment security (Van Ijzendoorn et al., 2023). However, the technique has so far not been used to enhance mentalisation abilities in parents of children with EDs. A randomised control trial using VIPP in conjunction with family therapy would provide valuable information about the mechanisms of change associated with both parent mentalisation and ED treatment outcomes.

5.5.5 Conclusion

The present study aimed to investigate whether parental mentalisation changes during a parent-focused group intervention at the start of a child's outpatient ED treatment. The findings suggest that parents who started the group uncertain about their child's mental states became more certain by the end of the group. Parents also displayed improved emotional clarity by the end of the group. The study also aimed to investigate whether change in parent mentalisation would predict change in children's clinical outcomes. Over the full 12 weeks of the study, there was an improvement in %mBMI and ED severity. However, parental change did not directly predict children's clinical improvement. Interestingly, it appears that child mentalisation predicts change in parent mentalisation: higher child mentalising ability at baseline predicts a lower amount of change in parent mentalisation. This result suggests that

adolescent mentalisation may play a crucial role in changing parents' ability to understand and respond to their children's mental states. While these results are promising, the small sample size of the study limits the generalisability of the findings. Future research should focus on recruiting a larger sample to allow for mediation analysis. This could help to determine if the observed changes in parents' mentalisation is important for clinical outcomes in some other way, even if they do not directly predict improvement in child ED outcomes. Overall, the findings suggest that parent mentalisation does change early in their child's treatment, but more research is needed to understand how this change may be important for families receiving outpatient ED treatment.

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Chapter 6: General Discussion

6.1 Overview of the Thesis

The overall aim of this thesis was to increase our understanding of the role of mentalisation in the development and treatment of eating disorders (EDs) in children and adolescents, and to explore the potential benefits of targeting mentalisation as a prevention target or therapeutic tool. This included investigating how changes in mentalisation, in both children and parents, affect the outcomes of ED treatment; and examining the link between mentalisation and risk and protective factors associated with disordered eating in a non-clinical sample of school children. Ultimately, I aimed to contribute to a greater understanding of the complex and multifaceted nature of mentalisation and its potential role in preventing and treating EDs. In this chapter, findings from across the studies of this thesis will be integrated alongside discussion of new developments in theory and evidence in the wider fields of mentalisation and childhood EDs, with the aim of providing an overall assessment of where the evidence now points.

Chapter 2 presented a cross-sectional survey study of London schoolchildren. The study tests the theory that mentalisation is related to disordered eating, that poor mentalisation may increase the risk of developing an ED, and that mentalisation will correlate positively with ED protective factors, and negatively with ED risk factors. The results indicate that poor mentalising ability about oneself is associated with higher frequency of ED symptoms and with being in a "higher risk" group for developing an ED (e.g. an EDE-QS score above 15 (Gideon et al., 2016; Prnjak et al., 2020). The study also found that different aspects of mentalisation are correlated with different risk and protective factors, with emotion dysregulation and perfectionism being probable correlates of mentalising ability.

Chapter 3 presented a secondary data analysis on a dataset of families who undertook family therapy across clinical sites in the United Kingdom. I aimed to answer the question, *"does parental mentalisation change through family therapy, and does this change in mentalisation relate to clinical treatment outcomes after nine months of treatment?*" The study found that although several aspects of child and parent mentalisation can change, changes do not predict treatment outcomes. Additionally, the study revealed that baseline measures, such as social impairment in young people and the severity of the ED, did not predict the extent to which parent or child mentalisation would change. This suggests that parent mentalisation change is not the mechanism through which clinical change occurs for families of adolescents with EDs.

In Chapter 4, I presented a brief overview of a meta-analysis and systematic review that I supervised, examining the effectiveness of group parenting interventions in improving parental mentalisation and whether change can affect children's social outcomes. The findings indicate that group interventions are an effective method for enhancing parental mentalisation in parents with or without mental health issues. Furthermore, it is possible that the improvements in mentalisation resulting from intervention may have a positive impact on the social outcomes of children.

Chapter 5 presented a prospective observational study of 38 parents enrolled in an Early Intervention Parent Group in England aimed at empowering parents to respond robustly and promptly to their child's eating problems. The study tested the theory that short parent-focused interventions influence parent mentalisation in the early stages of a child's treatment for an ED; that change can affect a child's clinical outcomes after three months; and whether any child or parent factors influence change in parent mentalisation. The results showed that parents who were uncertain about their child's mental states at the beginning of the group became more certain by the end of the intervention, and they also displayed improved emotional clarity. While the study found an overall improvement in the children's clinical outcomes, there was no direct link between changes in parental mentalisation and children's wellbeing. Interestingly, the study also found that higher levels of child mentalising ability at baseline predicted a lower amount of change in parental mentalisation.

In this chapter, the findings of the research presented in this thesis will be synthesised and discussed in the light of recent evidence and theoretical developments in the field of mentalisation and EDs in children and adolescents.

6.1.2 What is the relationship between mentalisation and disordered eating in adolescents with and without an ED diagnosis?

In Chapter 2, the results revealed that, in adolescents with no ED diagnosis, there were significant associations between disordered eating patterns and mentalisation. Negative relationships were found between disordered eating symptoms and mindfulness, while positive relationships were observed between disordered eating symptoms and a lack of emotional clarity. Importantly, higher levels of self-reported mindfulness predicted membership of the "low risk" group (i.e. an EDE-QS score of below 15), putting participants at lower risk of developing an ED (Gideon et al., 2016; Prnjak et al., 2020). In contrast, more uncertainty about emotions predicted membership of the "high risk" group (i.e. an EDE-QS score of above 15), indicating a higher risk of developing an ED (Gideon et al., 2016; Prnjak et al., 2020). These findings highlight the importance of examining individual aspects of mentalisation, mindfulness and emotional clarity in relation to ED risk.

The subsequent chapters investigated data collected from adolescents with an ED diagnosis who were receiving outpatient ED treatment. In Chapter 3, it was found that there is a relationship between disordered eating symptoms and self-mentalisation in this clinical population. Specifically, positive relationships were identified between disordered eating symptoms and a lack of emotional clarity. These findings indicate that individuals with greater difficulty in understanding their own emotions may exhibit higher levels of disordered eating symptoms. Chapter 5 further explored the relationship between disordered eating symptoms and mentalisation among adolescents receiving outpatient treatment for EDs. The results showed positive relationships between disordered eating symptoms and overall reflective functioning, although statistical significance was not reached. Similarly, there was a non-significant relationship between disordered eating symptoms and a lack of emotional clarity. Additionally, a potential trend was found between percentage of body mass index (%mBMI) and a lack of emotional clarity. Although statistical significance was not reached, the non-significant relationship between disordered eating symptoms and a lack of emotional clarity, as well as the trend between %mBMI and a lack of emotional clarity, suggests the importance of focusing future analysis on emotional understanding in relation to disordered eating behaviours.

The collective findings from the 3 studies reveal a consistent connection between disordered eating and mentalisation across both community and clinical populations. The strongest association was identified with self-mentalisation, aligning with established theoretical perspectives that view EDs as disorders of the self (Robinson, P., Skårderud & Sommerfeldt, 2017). Additionally, the findings in Chapter 2 indicate that the relationship between mentalisation and EDs is not solely the consequence of starvation as associations between mentalisation and disordered eating behaviours are seen in non-clinical, community samples too. The lack of significant relationship between mentalisation and %mBMI that were reported in Jewell et al.'s paper (2021) also supports the idea that impaired mentalisation is not solely a consequence of the disorder itself or the physiological effects of starvation, which has been theorised previously (Dinkler et al., 2021; Oldershaw et al., 2010).

The consistent finding that higher levels of disordered eating symptoms are associated with increased uncertainty regarding one's own emotions is noteworthy, emphasising the relevance of emotional clarity in the context of ED pathology. They underscore the potential benefits of early interventions targeting emotion dysregulation as preventive measures to reduce the risk of developing disordered eating. As the results of Chapter 2 highlight the significance of mindfulness in relation to the risk of developing EDs, interventions aimed at improving mindfulness skills may also be potential strategies to mitigate the emergence and progression of disordered eating patterns. This idea is supported by preliminary studies demonstrating

positive impact of mindfulness-based prevention programmes on ED cognitions like internalisation of the thin ideal (Atkinson & Wade, 2015).

6.1.3 How Does Mentalisation Correlate with Other Factors Associated with Disordered Eating?

An aim of Chapter 2 was to examine the relationships between mentalisation and various well-documented risk and protective factors that are associated with EDs. Disordered eating was strongly, positively correlated with perfectionism (both self-oriented and socially prescribed), total emotion dysregulation, poor family functioning and internalisation of the thin ideal, and strongly, negatively correlated with self-compassion and self-esteem. Different aspects of mentalisation were also found to be associated with these psychosocial factors. Overall reflective functioning demonstrated positive associations with self-oriented perfectionism, self-compassion, and self-esteem, while showing a negative relationship with total emotion dysregulation. Mindfulness, a component of self-mentalisation, exhibited a negative relationship with total emotion dysregulation, perfectionism, poor family functioning, and internalisation of the thin ideal, and a positive relationship with self-compassion and self-esteem. Lack of emotional clarity, another facet of self-mentalisation, displayed a negative association with self-compassion and self-esteem, but a positive relationship with perfectionism, poor family functioning, and internalisation of the thin ideal.

Perfectionism, emotion dysregulation, self-esteem, and self-compassion were strongly correlated with both disordered eating and all aspects of mentalisation, while poor family functioning and internalisation of the thin ideal were also significantly associated with both disordered eating and self-mentalisation. This highlights the interconnected nature of these variables and their relevance in understanding disordered eating and mentalisation processes and provides us with possible avenues for future research and analysis.

The strong correlation between perfectionism, reflecting a tendency to set excessively high standards for oneself and engage in rigid and self-critical thinking, and all aspects of mentalisation suggests that the relationship between mentalising and perfectionistic tendencies could influence the use of disordered eating behaviours. For instance, individuals who struggle to reflect accurately on their own internal experiences may exhibit perfectionistic traits, leading to a heightened risk for disordered eating. Studies have demonstrated that interventions targeting perfectionism are successful at reducing disordered eating (Robinson, & Wade, 2021); my results bolster the idea that routinely incorporating a perfectionism component to ED treatment and to prevention programmes should be explored. Additionally, my results suggest that exploring how perfectionism and mentalisation interact with one

another and influence disordered eating is an important area for research, and a potential treatment target.

The Sociocultural Internalisation of Appearance Questionnaire (SIAQ) measures the internalisation of societal norms including the thin ideal (Keery et al., 2004). The strong association between internalisation of societal norms, disordered eating and self-mentalisation raises questions about how these factors influence each other: difficulties in self-mentalisation may contribute to a heightened vulnerability to internalise and conform to these societal ideals, increasing the risk for disordered eating. Emotion dysregulation has been consistently identified as a significant factor in the development and maintenance of disordered eating (Dingemans, Danner & Parks, 2017; Lang et al., 2015; Lulé et al., 2014; Rothschild-Yakar, et al., 2018; Rothschild-Yakar, et al., 2019). Difficulties in mentalising one's own emotions (alexithymia) may hinder individuals' ability to understand and regulate their emotional experiences, thereby increasing vulnerability to disordered eating behaviours as maladaptive coping strategies. The strong correlations observed between self-esteem, self-compassion, disordered eating, and mentalisation indicate their significant influence on individuals' attitudes and behaviours related to body image and eating, and fit with previous research (Kelly, Vimalakanthan & Carter, 2014; Linardon et al., 2020; Messer, Anderson & Linardon, 2021; Meyer & Leppma, 2019; Pullmer, Coelho & Zaitsoff, 2019; Shaw & Cassidy, 2022). Theoretically, difficulties in mentalising about one's own experiences may impact self-esteem and self-compassion, contributing to negative body image and a higher likelihood of engaging in disordered eating behaviours. The implications for intervention are clear: both prevention programmes and early clinical interventions would benefit from the addition of techniques that improve self-mentalisation ability to reduce ED cognitions and behaviours. There is preliminary evidence that mindfulness can have a positive impact on ED cognitions (Atkinson & Wade, 2015; Atkinson & Wade, 2016) and that mindfulness, self-compassion and emotion regulation influence each other and cognitive distortions associated with EDs (Messer, Anderson & Linardon, 2021; Meyer & Leppma, 2019; Osborne et al., 2023). The youngest participants in Chapter 2, 3 and 5 exhibiting body dissatisfaction and disordered eating were 11 years old. Compelling evidence that school interventions can improve mentalisation ability, particularly concepts related to emotion regulation, in 7- and 8-year-olds is beginning to emerge (Lombardi et al., 2022). I suggest that ED prevention programmes should be targeting primary school aged children, to improve children's ability for self-mentalisation, with the hope that this will impact self-esteem and the use of disordered eating behaviours.

I hypothesised that deficits in mentalisation, particularly self-mentalisation, may indirectly contribute to the development of disordered eating behaviours by influencing perfectionism, internalisation of beauty ideals, and emotion regulation. The results suggest potential

pathways wherein poor self-mentalisation predicts body image concerns, specifically the internalisation of the thin ideal, which subsequently predicts the manifestation of disordered eating behaviours. Furthermore, I postulate that mindfulness may serve as a protective factor against the emergence of disordered eating; both prevention programmes and clinical interventions should incorporate techniques that bolster children's ability for mentalising about themselves (Atkinson & Wade, 2015; Atkinson & Wade, 2016; Omiwole et al., 2019). By fostering improvements in body satisfaction and emotion regulation, mindfulness interventions may facilitate the development of more compassionate and accepting attitudes towards the self, leading to enhanced self-esteem and subsequently lower levels of disordered eating behaviours.

In summary, the strong correlations between perfectionism, emotion dysregulation, self-esteem and self-compassion with both disordered eating and all aspects of mentalisation, along with the associations of poor family functioning and internalisation of the thin ideal with both disordered eating and self-mentalisation, underscore the interrelated nature of these variables. These findings emphasise the importance of considering multiple factors, including cognitive, emotional, interpersonal, and societal aspects, in understanding and addressing disordered eating. Future research and analysis should focus on how targeted prevention efforts, particularly mindfulness-based interventions, can mitigate the influence of beauty ideals, promoting self-esteem, self-compassion and emotion regulation, and may be a potentially effective approach to address disordered eating before the development of a full-blown ED.

6.1.4 The Role of Change in Parent Mentalisation

Chapter 4 revealed that parent mentalisation changes through group intervention, which is associated with improved outcomes, both behavioural and psychosocial, in children, but no studies had examined parent mentalisation in the context of children with EDs. Chapter 3 and Chapter 5 aimed to investigate the changes in mentalisation during outpatient ED treatment, specifically focusing on the speed of change and the impact of parent mentalisation on treatment outcomes.

In Chapters 3 and 5 I examined changes during treatment in parent mentalisation, using measures of certainty about mental states (the RFQ, the PRFQ and the DERS Lack of Emotional Clarity subscale). Good mentalisation has been conceptualised as being something in the middle of the certainty-uncertainty spectrum, reflecting a confident but open-minded understanding of mental states (Fonagy et al., 2016; Luyten et al., 2017). Due to the findings by Jewell et al. (2021) that high parent certainty at baseline predicts poor treatment outcomes, and the findings from the meta-analysis in Chapter 4, I hypothesised that certainty in mental

states in parents would decrease through treatment and this decrease would predict positive outcomes. However, in both Chapter 3 and Chapter 5, certainty increased across all variables, and the change did not predict treatment outcomes. Combined, these results suggest that, although parent mentalisation does change during their child's treatment, an increase in certainty about mental states of oneself and others is not the direct mechanism through which therapeutic change occurs for families. The increase in certainty observed in both studies might initially seem counterintuitive, considering that an increase in certainty has previously been conceptualised as negative. Mentalisation is a complex and dynamic process however, and changes may not follow a linear or expected trajectory. The increase in certainty observed may represent a temporary phase or initial response to therapy, which could later develop into a more nuanced and flexible understanding of mental states.

It is possible that in the context of ED treatment, certainty about mental states might need to be conceptualised differently compared to other populations. The early stages of family therapy and ED treatment often focus on parents taking control, re-establishing routines of eating and implementing meal plans, which can cause huge amounts of stress for the family. Over the course of my PhD, I had many discussions about how mentalisation may play a role in change. For example, one clinician explained that the father of one of her patients stated that he felt a need to turn down his ability to mentalise about his child during this early treatment stage. He felt that while he needed to empathise with his child and try to understand their experiences, if he fully empathised, he would not be able to feed his child or to put the boundaries in place to support them to get better. He expressed that he felt that it was too hard for him to attempt to experience what his child was experiencing. The clinician stressed that she felt that this "shut down" of mentalising ability at this crucial stage was a common experience for parents, and that it may be necessary for parents to deliberately tone it down, at least initially, to prevent empathising with their child's ED cognitions. This idea may reflect what is happening in Chapter 3 and Chapter 5: parent certainty about mental states increases in the early stages of ED treatment, but only for those parents who were particularly "uncertain" about their child's mental states when starting treatment. Is this increase in certainty an attempt by parents to successfully implement therapeutic suggestions, both protecting themselves from emotional harm and supporting their child's treatment goals? It may be that for these parents, it is important to be certain and refrain from over-empathising with their child's emotions in order to effectively follow the meal plan and refeeding plan, helping parents to maintain a more objective and effective stance, guide their child's eating behaviours and provide necessary support. Striking a balance between empathy and firmness is crucial for parents during ED treatment; being overly empathetic without appropriate boundaries and structure could hinder progress. A theoretical question arises here – does improving parent

mentalisation improve parents' ability to manage their child's distress and ED behaviours, through improvements in ability to put in boundaries and structure?

This idea that parent certainty about mental states needs to increase in the early stages of therapy corresponds with evidence which suggests that improvements in parent confidence may be related to mentalisation and this improvement is important for child outcomes (Berthelot et al., 2019; Eshkevari et al., 2022; Manshadi, Fallah & Chavoshi, 2023). In particular, a pilot study that assessed the effectiveness of the parent group examined in Chapter 5 suggested that parents report increased confidence following attendance at the group (Nicholls & Yi, 2012). If the increase in certainty seen in Chapter 3 and Chapter 5 is associated with enhanced confidence in adhering to the prescribed meal plan and utilising therapeutic skills, this suggests that parents may feel more assured and competent in supporting their child's recovery. This increased confidence could translate into improved treatment adherence and more effective implementation of therapeutic strategies.

Despite high levels of certainty predicting poor treatment outcomes in previous research (Jewell et al., 2021), the increase in certainty in Chapter 3 and 5 did not yield the adverse consequences that may be expected if excessive levels of parent certainty are damaging for children, as has been suggested previously (Jewell et al., 2021). Most families in both studies had positive treatment outcomes. It could be that parent mentalisation is a moderator of another relationship, or indeed another factor may be a mediator - the change in parent mentalisation might be related to improvements in other areas, which, in turn, predict treatment outcomes. In Jewell et al.'s study (2021), therapeutic alliance between families and healthcare providers at one month predicted treatment outcome at nine months. Certainty can provide clarity and assurance, supporting parents in decision-making and implementing treatment strategies. Increased certainty in parents' understanding of their child's mental states may be associated with improved therapeutic alliance and increased confidence in utilising therapeutic skills and adhering to the treatment programme. It could be that increased parent certainty predicts improvements in parent confidence and therapeutic alliance, and these factors then predict treatment outcome. The relationship between these factors warrants further attention in future research.

Mentalisation and certainty about mental states are just two aspects among many that could influence treatment outcomes. Other parental factors such as distress, motivation for change and self-efficacy may have stronger associations with treatment outcomes in the context of ED treatment. Additional research, utilising both quantitative and qualitative methodologies, could help identify the parental factors more closely associated with treatment outcomes. For example, while I have discussed how certainty in mental states (of oneself and of others) can be modified, I did not explore other psychosocial factors that could change and influence

treatment outcomes. As an example, alexithymia reduced in both Chapter 3 and 5 for parents and adolescents, suggesting that treatment improves families' ability to understand, label and express emotions. While mentalisation change may not directly predict treatment outcome, it could be important in predicting changes in other factors such as emotion regulation or communication between the family and therapeutic team. Future studies using a longitudinal approach would allow for mediation analysis to provide more understanding of how change in parent mentalisation impacts other factors to predict treatment outcomes.

It should be acknowledged that, although parent certainty did increase in both studies, this increase did not equate to very high levels of certainty i.e. hyper-mentalising. In fact, parents who improve in certainty likely started treatment very uncertain about their child's mental states, as demonstrated in Chapter 5. As treatment progresses, certainty increases to a moderate level, suggesting that parents are reaching the equilibrium of good mentalisation (see Fonagy et al. (2016) and Luytens et al. (2017)). This corresponds with what is seen clinically: parents come into treatment confused, with emotions running high, but become more open to support from services, and there is an improvement in their empathic abilities. Those who do not improve may have started treatment with a high level of certainty. Therefore, I suggest that, at assessment, parents with low certainty could be offered support to improve, potentially impacting empathy and confidence skills, which, in turn, predict treatment outcomes.

The fact that parent mentalisation, both of self and of others, can change, and can change quickly, in this population should be considered positive. As discussed in Chapter 4, improving parent mentalisation has positive, real-life impacts, including improved parent competence and satisfaction. Despite the lack of impact of mentalisation change on clinical outcomes demonstrated in Chapter 3 and 5, mentalisation should still be considered a potentially important mechanism to target through interventions, both in parents and adolescents. I would suggest that future research should examine how this change is influenced, or influences, other important predictors of good ED treatment prognosis, such as therapeutic relationship and family engagement. Equally, an emphasis on improving parent confidence and the parent's ability to manage the balance between empathy and firmness through improvement in parent mentalisation could be important for clinical outcomes and efficacy of family-based ED treatments.

6.1.5 Mentalisation, EDs and Autism

Autism spectrum disorder (ASD) has long been associated with difficulties in mentalisation, with altered social cognition and impairments in social interaction conceptualised as intrinsic characteristics of both ASD and mentalisation. Simon Baron-Cohen's Mind-Blindness theory

posits people with ASD experience difficulties in mentalisation, particularly impaired theory of mind (Baron-Cohen, Leslie & Frith, 1985; Happé, 2015). The inability to attribute mental states to oneself or others restricts one's understanding of social situations, contributing to the social communication difficulties observed in those with ASD. An association between ASD and EDs has been described (Brede et al., 2020; Rhind et al., 2014; Tchanturia et al., 2021), with individuals with ASD being at increased risk of developing EDs compared to the general population (Huke et al., 2013; Westwood & Tchanturia, 2017). Due to the deficits in mentalisation in both ASD (Happé, 2015) and EDs (Katznelson, 2014; Robinson, Skårderud & Sommerfeldt, 2017; Tasca, 2019), one might theorise that poor mentalisation serves as a transdiagnostic link between ASD and EDs, potentially explaining the observed association between the two conditions. For example, there is an association between ASD diagnosis and longer duration of AN (Saure et al., 2020) – is this relationship mediated by the influence of poor mentalisation? Through the studies described in Chapter 3 and Chapter 5, I aimed to further investigate the relationship between ASD, EDs and mentalisation in adolescents receiving ED treatment and their parents. Through correlational analysis, I observed that there were strong relationships between disordered eating and parent-rated autistic traits ($r > .3$). However, the direction of these relationships differed between the studies: in Chapter 3, higher levels of autistic traits correlated with higher ED severity, while in Chapter 5, reduced ED severity was associated with higher levels of autistic traits. In terms of mentalisation and parent-rated autistic traits, there were no significant relationships, and correlation coefficients were weak; this was apparent in both Chapters, using either mentalisation tool. There were moderate but non-significant relationships between mentalisation and ED symptomatology in Chapters 3 and 5. In Chapter 5, where parents completed an ASD self-report tool, there were no significant correlations with any of the baseline variables, and the relationship with mentalisation would be considered weak, at best. Based on my results, it is reasonable to suggest that the findings do not provide strong evidence supporting the notion that poor mentalising is an inherent autistic trait or the same construct in different language, nor that poor mentalisation is what accounts for the strong association between EDs and autism. The lack of significant relationships between mentalisation and autistic traits, as well as the varied and non-consistent relationships observed between disordered eating, autistic traits, and mentalisation, suggest that the association between mentalisation, EDs and autism is complex, and that there are other factors at play which warrant further examination.

6.2 Limitations of the Thesis

6.2.1 Time is an Illusion

Several noteworthy limitations emerged as a result of the time and resource constraints inherent in PhD research. The study described in Chapter 5 may well have benefited from a

longer follow-up period to comprehensively evaluate how and when parent mentalisation changes and what those changes mean for ED treatment outcomes; ideally, I would follow families for up to 12-months, as this is the average length of outpatient ED treatment (NHS England, 2015). However, for pragmatic reasons, the follow-up period was set at six weeks after finishing the parent group. This potentially limited the ability to capture the full range of outcomes and long-term impact, such as whether change in mentalisation influences child outcomes. Similarly, for the study described in Chapter 2, it would have been beneficial to implement a longitudinal design, collecting data at set timepoints encompassing the adolescence period. This extensive time span would have provided invaluable insights into the intricate developmental trajectories and potential long-term effects of the different factors associated with mentalisation. Unfortunately, because of the time constraints of PhD research, as well as the logistical challenges of collecting data from large numbers of children at regular intervals as a single researcher, it was not feasible to conduct such a study. Additionally, to encourage more students to engage in the research, all responses were anonymous, making it nearly impossible to match follow-up data to the original responses to conduct statistical analysis.

The unforeseen and widespread impact of the COVID-19 pandemic had a profound effect on the studies described in Chapter 2 and Chapter 5. The associated restrictions and safety measures significantly disrupted data collection timelines, leading to extensive delays. Consequently, my ability to conduct the in-depth and comprehensive analyses that were originally planned was restricted; for example, in Chapter 5, participant recruitment stopped me from conducting mediation analysis. The unanticipated consequences of pandemic restrictions, including remote data collection and limited access to participants, further complicated the research process, potentially influencing the representativeness and quality of the collected data.

6.2.2 Measuring Mentalisation

As discussed in Chapter 1, Luytens and colleagues propose several steps for assessing mentalisation: evaluating the overall capacity for mentalisation; creating a mentalising profile by assessing where the client falls on the dimensions of mentalising, which requires eliciting arousal during the assessment; assessing individual thresholds for switching between controlled and automatic mentalising and the time it takes to return to baseline; understanding the "non-mentalising" modes that individuals resort to when effective mentalisation fails; favouring assessments that actively engage individuals in social communication; and exploring how mentalising impairments affect the client's capacity for epistemic trust.

Using self-report measures to assess mentalisation was a pragmatic choice, to address the time pressures inherent in collecting data as a single researcher. While the measures I used

in each study are widely used, easy to administer and provide valuable insights, self-report measures have limited ability to capture the complex, multifaceted nature of mentalisation. Factors such as response biases, subjective interpretations, or difficulties in introspection could potentially influence the accuracy and reliability of the findings. Traditional measures, such as self-reports and structured interviews, predominantly capture explicit or controlled forms of mentalisation, lacking insights into implicit and automatic processes. Considering that mentalisation emerges from social interactions, it can be argued that assessments should involve interpersonal dynamics. Questionnaires and structured interviews often fail to evoke significant arousal, necessitating probing and challenging interactions with others. Complementing self-report measures with other measures, such as behavioural observations or real-time mentalisation tasks, could have enhanced the validity and comprehensiveness of the findings. The use of mentalising profiles, which integrate information from multiple sources, presents a promising avenue to address these concerns and provide a more holistic assessment of mentalisation (Gagliardini et al., 2020; Simonsen et al., 2020). Equally, one recent paper describes the use of a network analysis approach incorporating both self-reports and objective socio-cognitive computerised tasks, to understand the relationship between empathy, mentalisation and ED maintenance (Monteleone et al., 2020).

Originally, I had intended to include the Five-Minute Speech Sample coded for Reflective Functioning (FMSS-RF) (Adkins, Luyten & Fonagy, 2018; Adkins et al., 2022; Bammens, Adkins & Badger, 2015) in the parent group study (Chapter 5) to complement the self-report measures of parent mentalisation. The FMSS is a standardised assessment tool designed to elicit and capture a parent's capacity for mentalisation during a brief, structured speech task. Parents are given five minutes to talk about their relationship with their child or a specific interaction they had with their child. These samples are then transcribed and coded using a manual that assesses the quality of the parent's ability to mentalise about their child. The coding manual provides guidelines for rating the parent's ability to mentalise, such as identifying the presence of mental state talk, coherence of the narrative, and the integration of affective and cognitive dimensions. Coders assign scores based on the observed levels of mentalisation, capturing both explicit and implicit mentalisation within the parent's speech. Integrating the FMSS-RF alongside self-report measures offers a comprehensive and multi-dimensional assessment of parent mentalisation. While self-report measures capture subjective perceptions, the FMSS-RF provides an independent and observational measure of mentalisation capacity. By combining these approaches, I had hoped to gain a more comprehensive understanding of parent mentalisation, encompassing both self-perceptions and observed mentalising behaviour. However, due to time constraints and the impact of

COVID-19 on recruitment, I was only able to collect this type of data from three parents, which was not enough data to conduct meaningful analysis.

6.2.3 Over-focus on Anorexia Nervosa

It is important to acknowledge that most participants in the Chapter 3 and 5 studies were diagnosed with restrictive anorexia nervosa (AN). AN, characterised by severe restriction of food intake, distorted body image, and intense fear of gaining weight, represents a distinct subtype of ED. It is crucial to recognise that AN differs significantly from other EDs, such as binge-eating disorder (BED). BED is characterised by recurrent episodes of uncontrollable and excessive food consumption, often accompanied by a sense of loss of control, guilt, and distress. Unlike AN, individuals with BED typically do not engage in extreme dietary restriction or exhibit the same level of weight and shape concerns. The contrasting clinical presentations of AN and BED suggest that the relationship between disordered eating and mentalisation may vary across different ED subtypes. As a result, while the findings from my studies provide valuable insights into the specific experiences and characteristics of adolescents with AN, caution should be exercised when generalising these findings to individuals with different ED diagnoses. Future research endeavours should aim to include participants from diverse ED subtypes, such as BED, bulimia nervosa, etc. This approach would enable a comprehensive understanding of how disordered eating and mentalisation intersect across different ED presentations, contributing to the development of more targeted and effective interventions for individuals across the spectrum of EDs.

Despite these limitations, the findings of my research provide valuable insights within the confines and context in which the studies were conducted. They contribute to the existing knowledge base and serve as a starting point for future investigations that can address these limitations. Recognising limitations provides a foundation for future investigations to further advance our understanding of the role of mentalisation in the development and maintenance of disordered eating, and design more robust future studies.

6.3 Future Directions

6.3.1 Longitudinal Investigation of Developmental Trajectories

Previous research has consistently indicated a positive and significant correlation between age and mentalisation, and age and disordered eating (Blakemore, 2008; Borelli et al., 2019; Cropp, Alexandrowicz & Taubner, 2019; Goddings et al., 2012; Rohde et al., 2017). However, contrary to these established findings, the study described in Chapter 2 did not find a significant relationship between age and either of these variables. This inconsistency challenges the established understanding of the developmental trajectories of these behaviours and cognitive processes. It is worth noting that the observed discrepancy in the

relationship between age and disordered eating, and age and mentalisation, may be attributed to the unique composition of the sample, with only 17% identifying as White and over half being male. Such demographic characteristics diverge significantly from the majority of previous studies that have predominantly focused on more homogeneous populations. A longitudinal investigation of young people in the non-clinical population, with data captured at two-year intervals encompassing the critical period of adolescence (10 to 24 years old), would provide valuable insights into how disordered eating and mentalisation evolve over time, shedding light on their developmental interplay. Exploring the dynamic relationship between disordered eating, mentalisation and psychosocial factors like self-esteem and family-functioning, throughout development has important implications. It can provide valuable insights into the factors that contribute to the development and maintenance of these behaviours and cognitive processes. Understanding how these constructs interact and influence each other can inform the design of preventive and intervention strategies targeting disordered eating and mentalisation. Employing a longitudinal design allows for the proper utilisation of regression and mediation analyses. These enable a comprehensive examination of potential mediating and moderating factors that may contribute to the relationship between disordered eating and mentalisation. By incorporating these statistical analyses, we can potentially uncover novel developmental patterns between these variables over time. It will provide a robust foundation for understanding the complex nature of these phenomena and their developmental processes, ultimately guiding future research and clinical practices, to prevent and address disordered eating and promote healthy mentalisation.

6.3.2 Mediators and Moderators

The studies described in Chapter 3 and Chapter 5, as well as the meta-analysis summarised in Chapter 4, consistently reveal that parental mentalisation undergoes changes during treatment processes, either in a parent-focused group setting or through family therapy, with parents displaying increased certainty regarding mental states and their own emotional experiences. However, the results also suggest that improvement in parent mentalisation is not the direct process by which clinical improvement in child EDs occurs, as change does not predict treatment outcomes. It is essential for future research to adopt a comprehensive approach by recruiting larger samples and incorporating additional variables to facilitate mediation and moderation analyses. By delving deeper into the underlying mechanisms, researchers can shed light on why mentalisation changes occur and identify the factors that may be influencing, and influenced by, these changes, which in turn could impact treatment outcomes. Several potential avenues warrant exploration. Firstly, examining the therapeutic alliance between families and healthcare providers could yield valuable insights. A strong therapeutic alliance fosters a collaborative and trusting relationship, enabling families to feel

more supported and understood throughout the treatment process; in Jewell et al.'s study, child mentalisation predicts therapeutic alliance, which in turn predicts treatment outcome (Jewell et al., 2021). Further research should therefore focus on developing our understanding of the relationship between mentalisation change, therapeutic alliance and ED treatment outcome.

Secondly, the parent-child attachment bond will likely play a crucial role in understanding the impact of mentalisation changes. Exploring how changes in mentalisation interact with the quality and security of parent-child attachment could reveal important dynamics. A secure attachment relationship may facilitate parents' ability to accurately perceive and respond to their child's emotional and psychological needs, thus potentially influencing treatment outcomes. I suggest that this could be done through adapted Video-feedback Intervention to Promote Positive Parenting (VIPP) (Juffer et al., 2017) in conjunction with family therapy. There is preliminary evidence that VIPP is effective at improving parenting sensitivity and child attachment security, and reducing child behavioural problems (Van Ijzendoorn et al., 2023). However, to the best of my knowledge, VIPP has not been used with parents of adolescents with EDs and it has not been used in conjunction with gold-standard treatments for EDs. The intervention lends itself well to family therapy because of the focus on attachment and interactions between parent and child (Ramchandani et al., 2017), and may positively impact the treatment response and rates of hospital admission (Lock & Le Grange, 2019). Additionally, investigating parents' attachment to their own parents could be informative. Parental attachment experiences from their own childhood may shape their mentalisation capacities and subsequently influence their responses to their child's ED treatment. Exploring this link could provide a deeper understanding of the intergenerational transmission of attachment and mentalisation, and its relevance to ED treatment outcomes.

Another use for VIPP is in parenting interventions for families of children who are at high risk of *developing* an ED. Having a family member with an ED is a significant risk factor for the development of EDs in children and adolescents (Barakat et al., 2023), but there is evidence that VIPP can be used to improve relationships between parents with a history of EDs and their children, which has a positive effect on weight maintenance in young children (Stein et al., 2006). Poor family functioning, characterised by ineffective communication, lack of support, or dysfunctional dynamics, has also been linked to disordered eating (Holtom-Viesel & Allan, 2014; Kroplewski et al., 2019). In Chapter 2, my results demonstrated that there was a correlation between poor family functioning and self-mentalisation, suggesting that family environment may play a role in shaping individuals' ability to mentalise their own experiences, which in turn may impact on their use of disordered eating behaviours. The use of VIPP as an

ED prevention strategy for families, through improvement in family communication and attachment (Van Ijzendoorn et al., 2023), is an area of research that should be prioritised.

Lastly, variables such as parental confidence could contribute to the complex interplay between mentalisation changes and treatment outcomes. Previous studies demonstrated that the group intervention described in Chapter 5 improves parent confidence (Donnelly et al., 2023; Nicholls & Yi, 2012; Rosello et al., 2021); it could be hypothesised that improved parent mentalisation may correlate with improvement in parent confidence, which then impacts treatment outcomes. Examining how changing other factors interacts with parental mentalisation could provide a more comprehensive understanding of the mechanisms underlying treatment effectiveness.

By recruiting larger sample sizes and incorporating a broader range of variables, researchers can explore potential mediators and moderators that may explain the influence of changes in parental mentalisation on treatment outcomes. Taking a comprehensive approach allows for more robust statistical analyses, increasing the generalisability of the findings, and contributes to a more nuanced understanding of why mentalisation changes occur and how they relate to treatment outcomes. Understanding the intricate web of factors that shape and are shaped by parental mentalisation is crucial for the development of tailored interventions that optimise treatment effectiveness and promote positive long-term outcomes for both parents and their children.

6.3.3 Measuring Mentalisation

Due to time constraints, I used only self-report measures in the studies in Chapter 2 and Chapter 5. However, as discussed, it is crucial to incorporate measures of mentalisation that encompass various dimensions when studying mentalisation; self-reports may be influenced by biases or limited self-awareness. To achieve a more thorough understanding, it is essential to measure different dimensions of mentalising, including automatic-controlled, self-other, internal-external, and cognitive-affective aspects. By incorporating multiple measures, and creating a mentalising profile, a more nuanced comprehension of the role of mentalisation in the development and maintenance of EDs among children and adolescents can be attained. There are several suggestions that future studies could incorporate, which I will now outline.

In future school-based studies, incorporating teacher observations alongside young people's self-reports can provide a holistic perspective on mentalisation. Teachers' observations offer valuable insights into a child's mentalising abilities within the educational setting, supplementing the self-reported information. Similarly, parent observations of their child's ability to mentalise could contribute to a comprehensive understanding of a child's mentalising abilities within a context outside of the school environment. Observer-rated measures, such

as parent or teacher ratings, offer an external perspective on individuals' mentalising abilities. These ratings can capture behavioural manifestations of mentalising skills and provide valuable insights that complement self-reports. Observers may notice aspects of mentalisation that individuals themselves may not be aware of or may underreport.

Performance-based assessments allow for a more direct evaluation of individuals' cognitive abilities and can provide valuable information about their mentalising skills. Innovative tools such as the Movie for Assessment of Social Cognition (Dziobek et al., 2006) can be employed alongside self-reports to improve our understanding of a child's overall ability to mentalise. This interactive tool provides ecologically valid scenarios and allows for the assessment of social cognition, including mentalising, in a more naturalistic setting (Fossati et al., 2018; Monteleone et al., 2020). By utilising such measures, researchers can gain a more nuanced understanding of mentalising abilities, contributing to a richer analysis of disordered eating among children and adolescents.

In future replications of the clinical studies described in Chapter 3 and Chapter 5, employing a range of assessment methods is crucial. Clinician-rated transcript measures offer valuable insights into a parent's mentalising ability that complement self-report data, and measures such as the Reflective Functioning Scale (RFS), used with the Adult Attachment Interview (AAI), have been used regularly in clinical assessment and research. Tools like the Five-Minute Speech Sample Coded for Reflective Functioning (FMSS-RF) assess a parent's ability to reflect upon their own and their child's mental states; parents are asked to talk about their child for five minutes and the transcript is then coded by the researcher (Adkins, Luyten & Fonagy, 2018; Adkins et al., 2022; Bammens, Adkins & Badger, 2015). Through the analysis of these measures, in conjunction with data from measures like the RFQ or the PRFQ, researchers can gain insights into the patterns of parent-child interaction and their influence on the child's mentalising abilities. By incorporating these assessment methods, a more comprehensive understanding of mentalisation in the context of parent-child dynamics can be achieved. Evaluating parent mentalisation about their child and others enables valuable comparisons and a deeper understanding of mentalising within the family context. Comparing parent-child mentalising profiles facilitates the identification of discrepancies or congruence, providing valuable information for tailoring interventions and treatment approaches. To do this, I suggest the use of VIPP (Juffer, Bakermans-Kranenburg & Van Ijzendoorn, 2008; Juffer et al., 2017), as it lends itself well to the use of objective measures of mentalisation (e.g. through therapist ratings of videos of interactions) alongside self-report of mentalisation, to create mentalising profiles.

Finally, using measures that assess individual aspects of mentalisation, such as theory of mind, empathy, alexithymia or mindfulness, is vital for a comprehensive understanding of

human cognition and psychological processes. For example, in Chapter 2, the results indicate that disordered eating is related to self-mentalising skills, but not overall mentalising skills. By utilising measures that capture individual aspects of mentalising, researchers can gain valuable insights into the multifaceted nature of mentalisation and its role in various psychological processes and disorders, thereby enhancing the development of targeted interventions and treatment approaches.

In conclusion, incorporating a comprehensive range of measures of mentalisation, encompassing various dimensions and assessment methods, is crucial when studying EDs in children and adolescents. Relying solely on self-reports may overlook important aspects of mentalising abilities, limiting the understanding of these complex disorders. By using multiple types of assessment, researchers can synthesise the findings and obtain a more comprehensive, robust and accurate picture of individuals' mentalising abilities. This approach helps to minimise the limitations and biases associated with any single assessment method. By expanding the scope of assessment to include teacher and parent ratings, innovative tools, and clinician observations, researchers can capture the multidimensional nature of mentalisation. This integrative approach will ultimately advance knowledge of the underlying mechanisms of EDs, facilitating the development of more targeted and effective interventions.

6.4 Conclusion

In conclusion, this thesis has shed light on the importance of mentalisation in the context of EDs and its implications for both parents and adolescents. Through the examination of various factors and their associations, several key findings have emerged.

Firstly, it is evident that parent mentalisation undergoes changes through ED intervention, either family or parent-focused, and these changes can occur rapidly. Although improvements occur, these changes do not directly predict treatment outcomes, suggesting that while improvement may be beneficial, mentalisation is not the sole determining factor in treatment success. I have posited that enhanced parent mentalisation may be associated with increased confidence in skills and abilities, as well as improved emotion regulation. Further analysis using moderation and mediation techniques is warranted to explore these potential relationships.

Additionally, the thesis highlights the significant role of mentalising abilities in the development of disordered eating, particularly in relation to poor self-mentalisation, which encompasses emotional clarity and mindfulness. The relationship between mentalisation and disordered eating extends beyond the clinical population, as it is observed in adolescents from various genders and ethnicities in the community. However, it is necessary to conduct longitudinal research to explore whether this association influences the future diagnosis of EDs. Moreover,

the thesis highlights the links between mentalising abilities and protective factors, particularly self-mentalisation. While these associations suggest the potential protective nature of mentalisation, longitudinal studies are required to ascertain its true impact. The thesis also emphasises that mentalisation is not synonymous with autistic traits, although some constructs overlap, and underscores the need to understand the unique characteristics and implications of each construct, and how they influence the development and maintenance of EDs.

It is clear that mentalisation matters in the context of EDs, but measuring it accurately remains a challenge. Therefore, the use of a range of assessments that encompass the full range of the dimensions of mentalisation is essential to capture the complexity of the relationship between mentalisation and EDs. The inclusion of Video-feedback Intervention to Promote Positive Parenting (VIPP) could enhance the assessment process and provide valuable insights into parent mentalisation, as well as improve ED treatment outcomes for adolescents.

Finally, the thesis proposes avenues for future research. Longitudinal studies that examine the concurrent development of ED and mentalisation would provide valuable insights into their interconnectedness. Additionally, integrating VIPP alongside family therapy or as a preventive measure in ED development is suggested, along with incorporating aspects of self-mentalisation into ED prevention programs.

In conclusion, this thesis has underscored the significance of mentalisation in the context of eating disorders, highlighting its associations with parent and adolescent outcomes. While improvements in mentalisation have been observed, and relationships with important psychosocial factors emphasised, further research is needed to fully understand its impact on treatment outcomes and preventative strategies. By addressing these research gaps, it is possible to enhance our understanding of mentalisation and its role in the prevention and treatment of EDs in children and adolescents.

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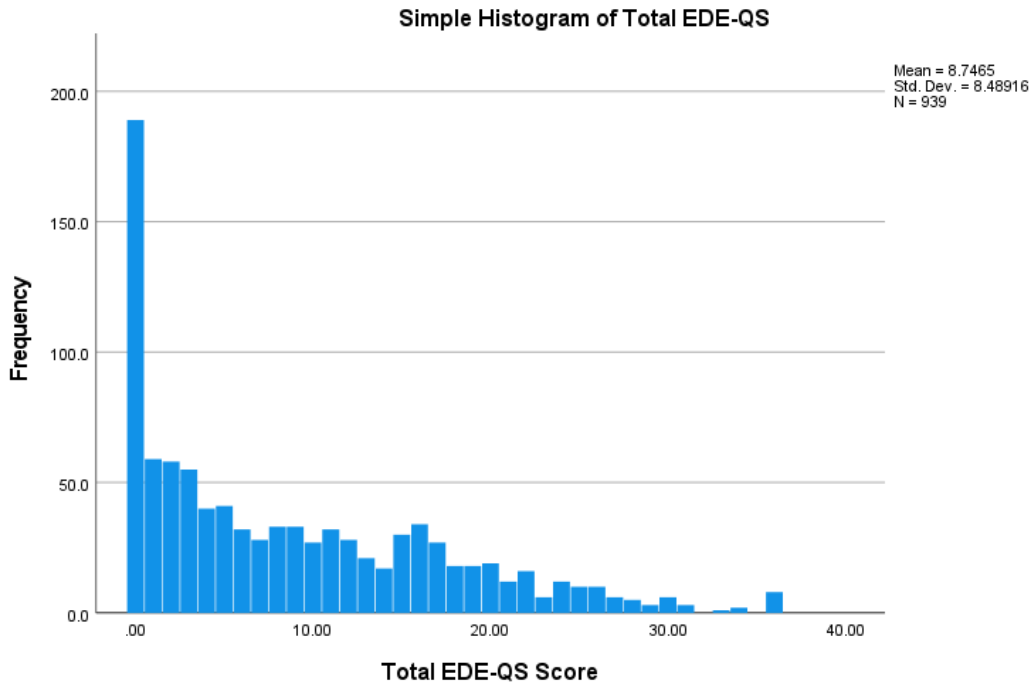
Appendices

Appendix 1

Histogram showing the full range of EDE-QS scores for the community school sample.



Appendix 2.1

Regression models conducted for the change in parent mentalisation variables (Change in RFQ8 Certainty) at different imputation steps.

Model Summary[b]

Imputation Number	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				Durbin-Watson
						R Square Change	F Change	df1	df2	Sig. F Change	
Original data	1	.145[a]	.021	-.133	.64079	.021	.137	3	19	.937	1.919
1	1	.314[a]	.099	.048	.70498	.099	1.967	3	54	.130	2.092
2	1	.218[a]	.048	-.005	.72460	.048	.901	3	54	.447	2.027
3	1	.194[a]	.037	-.016	.72847	.037	.701	3	54	.556	2.072
4	1	.172[a]	.030	-.024	.73142	.030	.550	3	54	.650	2.088
5	1	.232[a]	.054	.001	.72218	.054	1.028	3	54	.388	2.219
6	1	.195[a]	.038	-.015	.72823	.038	.713	3	54	.549	2.081
7	1	.216[a]	.047	-.006	.72503	.047	.878	3	54	.458	2.089
8	1	.167[a]	.028	-.026	.73203	.028	.519	3	54	.671	2.074
9	1	.218[a]	.048	-.005	.72461	.048	.900	3	54	.447	2.039
10	1	.271[a]	.073	.022	.71480	.073	1.422	3	54	.246	2.150

a. Predictors: (Constant), W4H at Baseline, SRS_T_TOTAL, EDEQ_Global

b. Dependent Variable: RFQ8_C_Change_P_T1_T5

Imputation Number	Model		Sum of Squares	df	Mean Square	F	Sig.
Original data	1	Regression	0.17	3	0.06	0.14	.937[b]
		Residual	7.80	19	0.41		
		Total	7.97	22			
1	1	Regression	2.93	3	0.98	1.97	.130[b]
		Residual	26.84	54	0.50		
		Total	29.77	57			
2	1	Regression	1.42	3	0.47	0.90	.447[b]
		Residual	28.35	54	0.53		
		Total	29.77	57			
3	1	Regression	1.12	3	0.37	0.70	.556[b]
		Residual	28.66	54	0.53		
		Total	29.77	57			
4	1	Regression	0.88	3	0.29	0.55	.650[b]
		Residual	28.89	54	0.54		
		Total	29.77	57			
5	1	Regression	1.61	3	0.54	1.03	.388[b]
		Residual	28.16	54	0.52		
		Total	29.77	57			
6	1	Regression	1.13	3	0.38	0.71	.549[b]
		Residual	28.64	54	0.53		
		Total	29.77	57			
7	1	Regression	1.39	3	0.46	0.88	.458[b]
		Residual	28.39	54	0.53		
		Total	29.77	57			
8	1	Regression	0.83	3	0.28	0.52	.671[b]
		Residual	28.94	54	0.54		
		Total	29.77	57			
9	1	Regression	1.42	3	0.47	0.90	.447[b]
		Residual	28.35	54	0.53		
		Total	29.77	57			
10	1	Regression	2.18	3	0.73	1.42	.246[b]
		Residual	27.59	54	0.51		
		Total	29.77	57			

a. Dependent Variable: RFQ8_C_Change_P_T1_T5

b. Predictors: (Constant), W4H at Baseline, SRS_T_TOTAL, EDEQ_Global

Imputation Number	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
			B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
Original data	1	(Constant)	-0.02	1.65		-0.01	0.99	-3.47	3.44					
		SRS_T_TOTAL	-0.01	0.02	-0.13	-0.57	0.58	-0.05	0.03	-0.13	-0.13	-0.13	0.93	1.07
		EDEQ_Global	0.00	0.11	0.00	0.00	1.00	-0.22	0.22	-0.01	0.00	0.00	0.74	1.35
		W4H at Baseline	0.00	0.02	0.06	0.23	0.82	-0.03	0.04	0.06	0.05	0.05	0.78	1.28
1	1	(Constant)	0.48	1.08		0.44	0.66	-1.69	2.65					
		SRS_T_TOTAL	-0.02	0.01	-0.30	-2.06	0.04	-0.04	0.00	-0.31	-0.27	-0.27	0.77	1.29
		EDEQ_Global	-0.01	0.07	-0.03	-0.18	0.86	-0.16	0.14	-0.15	-0.02	-0.02	0.70	1.43
		W4H at Baseline	0.01	0.01	0.06	0.43	0.67	-0.02	0.03	0.01	0.06	0.06	0.89	1.12
2	1	(Constant)	-0.05	1.10		-0.05	0.96	-2.25	2.15					
		SRS_T_TOTAL	-0.01	0.01	-0.14	-1.07	0.29	-0.03	0.01	-0.17	-0.14	-0.14	0.97	1.04
		EDEQ_Global	-0.07	0.07	-0.15	-1.03	0.31	-0.21	0.07	-0.15	-0.14	-0.14	0.86	1.16
		W4H at Baseline	0.01	0.01	0.07	0.50	0.62	-0.02	0.03	0.01	0.07	0.07	0.89	1.12
3	1	(Constant)	-0.31	1.05		-0.29	0.77	-2.41	1.80					
		SRS_T_TOTAL	0.00	0.01	-0.10	-0.75	0.46	-0.02	0.01	-0.14	-0.10	-0.10	0.94	1.06
		EDEQ_Global	-0.07	0.07	-0.15	-1.02	0.31	-0.21	0.07	-0.15	-0.14	-0.14	0.84	1.19
		W4H at Baseline	0.01	0.01	0.06	0.41	0.68	-0.02	0.03	0.01	0.06	0.06	0.88	1.14
4	1	(Constant)	-0.39	1.15		-0.34	0.74	-2.69	1.91					
		SRS_T_TOTAL	0.00	0.01	-0.05	-0.34	0.73	-0.02	0.02	-0.07	-0.05	-0.05	0.97	1.03
		EDEQ_Global	-0.08	0.07	-0.17	-1.16	0.25	-0.22	0.06	-0.15	-0.16	-0.16	0.87	1.15
		W4H at Baseline	0.01	0.01	0.06	0.45	0.66	-0.02	0.03	0.01	0.06	0.06	0.88	1.14
5	1	(Constant)	-0.14	1.04		-0.13	0.90	-2.22	1.95					
		SRS_T_TOTAL	-0.01	0.01	-0.18	-1.23	0.22	-0.03	0.01	-0.21	-0.17	-0.16	0.85	1.17
		EDEQ_Global	-0.05	0.07	-0.11	-0.72	0.48	-0.20	0.09	-0.15	-0.10	-0.10	0.77	1.29
		W4H at Baseline	0.01	0.01	0.07	0.50	0.62	-0.02	0.03	0.01	0.07	0.07	0.89	1.12
6	1	(Constant)	-0.30	1.05		-0.29	0.78	-2.41	1.80					
		SRS_T_TOTAL	-0.01	0.01	-0.11	-0.77	0.45	-0.03	0.01	-0.13	-0.10	-0.10	0.93	1.08
		EDEQ_Global	-0.07	0.07	-0.15	-1.04	0.30	-0.21	0.07	-0.15	-0.14	-0.14	0.85	1.18
		W4H at Baseline	0.01	0.01	0.08	0.56	0.58	-0.02	0.03	0.01	0.08	0.08	0.89	1.13
7	1	(Constant)	-0.14	1.07		-0.13	0.90	-2.28	2.00					
		SRS_T_TOTAL	-0.01	0.01	-0.15	-1.04	0.30	-0.03	0.01	-0.18	-0.14	-0.14	0.90	1.11
		EDEQ_Global	-0.06	0.07	-0.13	-0.89	0.38	-0.20	0.08	-0.15	-0.12	-0.12	0.82	1.22
		W4H at Baseline	0.01	0.01	0.08	0.54	0.60	-0.02	0.03	0.01	0.07	0.07	0.89	1.12
8	1	(Constant)	-0.48	1.17		-0.41	0.68	-2.83	1.86					
		SRS_T_TOTAL	0.00	0.01	-0.02	-0.17	0.87	-0.02	0.02	-0.06	-0.02	-0.02	0.94	1.06
		EDEQ_Global	-0.08	0.07	-0.17	-1.17	0.25	-0.22	0.06	-0.15	-0.16	-0.16	0.85	1.18
		W4H at Baseline	0.01	0.01	0.07	0.46	0.65	-0.02	0.03	0.01	0.06	0.06	0.86	1.16
9	1	(Constant)	-0.01	1.12		-0.01	1.00	-2.25	2.24					
		SRS_T_TOTAL	-0.01	0.01	-0.15	-1.07	0.29	-0.02	0.01	-0.19	-0.14	-0.14	0.86	1.17
		EDEQ_Global	-0.06	0.07	-0.12	-0.78	0.44	-0.20	0.09	-0.15	-0.11	-0.10	0.78	1.29
		W4H at Baseline	0.00	0.01	0.03	0.23	0.82	-0.02	0.03	0.01	0.03	0.03	0.84	1.19
10	1	(Constant)	0.24	1.09		0.22	0.83	-1.94	2.41					
		SRS_T_TOTAL	-0.02	0.01	-0.22	-1.63	0.11	-0.04	0.00	-0.25	-0.22	-0.21	0.92	1.08
		EDEQ_Global	-0.05	0.07	-0.11	-0.79	0.44	-0.19	0.08	-0.15	-0.11	-0.10	0.83	1.21
		W4H at Baseline	0.01	0.01	0.07	0.50	0.62	-0.02	0.03	0.01	0.07	0.07	0.89	1.12
Pooled	1	(Constant)	-0.11	1.13		-0.10	0.92	-2.33	2.12					
		SRS_T_TOTAL	-0.01	0.01		-0.83	0.41	-0.03	0.01	-0.17	-0.14	-0.13		
		EDEQ_Global	-0.06	0.07		-0.84	0.40	-0.21	0.08	-0.15	-0.12	-0.12		
		W4H at Baseline	0.01	0.01		0.45	0.65	-0.02	0.03	0.01	0.06	0.06		

Appendix 2.2

Regression models conducted for the change in parent mentalisation variables (Change in RFQ8 Uncertainty) at different imputation steps.

Model Summary[b]

Imputation Number	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				Durbin-Watson
						R Square Change	F Change	df1	df2	Sig. F Change	
Original data	1	.511[a]	.262	.145	.22107	.262	2.243	3	19	.116	1.981
1	1	.151[a]	.023	-.031	.30946	.023	.423	3	54	.737	1.949
2	1	.169[a]	.028	-.026	.30859	.028	.527	3	54	.666	1.930
3	1	.139[a]	.019	-.035	.31004	.019	.355	3	54	.786	1.919
4	1	.309[a]	.096	.045	.29774	.096	1.902	3	54	.140	1.833
5	1	.169[a]	.028	-.025	.30858	.028	.528	3	54	.665	1.956
6	1	.167[a]	.028	-.026	.30868	.028	.516	3	54	.673	1.867
7	1	.131[a]	.017	-.037	.31037	.017	.316	3	54	.814	1.912
8	1	.174[a]	.030	-.024	.30829	.030	.563	3	54	.642	1.928
9	1	.133[a]	.018	-.037	.31028	.018	.325	3	54	.807	1.911
10	1	.132[a]	.017	-.037	.31036	.017	.317	3	54	.813	1.917

a. Predictors: (Constant), W4H at Baseline, SRS_T_TOTAL, EDEQ_Global

b. Dependent Variable: RFQ8_U_Change_P_T1_T5

ANOVA[a]

Imputation Number	Model		Sum of Squares	df	Mean Square	F	Sig.
Original data	1	Regression	0.33	3	0.11	2.24	.116[b]
		Residual	0.93	19	0.05		
		Total	1.26	22			
1	1	Regression	0.12	3	0.04	0.42	.737[b]
		Residual	5.17	54	0.10		
		Total	5.29	57			
2	1	Regression	0.15	3	0.05	0.53	.666[b]
		Residual	5.14	54	0.10		
		Total	5.29	57			
3	1	Regression	0.10	3	0.03	0.36	.786[b]
		Residual	5.19	54	0.10		
		Total	5.29	57			
4	1	Regression	0.51	3	0.17	1.90	.140[b]
		Residual	4.79	54	0.09		
		Total	5.29	57			
5	1	Regression	0.15	3	0.05	0.53	.665[b]
		Residual	5.14	54	0.10		
		Total	5.29	57			
6	1	Regression	0.15	3	0.05	0.52	.673[b]
		Residual	5.15	54	0.10		
		Total	5.29	57			
7	1	Regression	0.09	3	0.03	0.32	.814[b]
		Residual	5.20	54	0.10		
		Total	5.29	57			
8	1	Regression	0.16	3	0.05	0.56	.642[b]
		Residual	5.13	54	0.10		
		Total	5.29	57			
9	1	Regression	0.09	3	0.03	0.33	.807[b]
		Residual	5.20	54	0.10		
		Total	5.29	57			
10	1	Regression	0.09	3	0.03	0.32	.813[b]
		Residual	5.20	54	0.10		
		Total	5.29	57			

a. Dependent Variable: RFQ8_U_Change_P_T1_T5

b. Predictors: (Constant), W4H at Baseline, SRS_T_TOTAL, EDEQ_Global

Imputation Number	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
			B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
Original data	1	(Constant)	1.16	0.57		2.03	0.06	-0.04	2.35					
		SRS_T_TOTAL	-0.01	0.01	-0.43	-2.09	0.05	-0.03	0.00	-0.44	-0.43	-0.41	0.93	1.07
		EDEQ_Global	-0.01	0.04	-0.05	-0.23	0.82	-0.08	0.07	-0.26	-0.05	-0.05	0.74	1.35
		W4H at Baseline	-0.01	0.01	-0.23	-1.04	0.31	-0.02	0.01	-0.26	-0.23	-0.20	0.78	1.28
1	1	(Constant)	-0.29	0.48		-0.61	0.55	-1.24	0.66					
		SRS_T_TOTAL	0.00	0.01	0.09	0.57	0.57	-0.01	0.01	0.12	0.08	0.08	0.77	1.29
		EDEQ_Global	0.01	0.03	0.06	0.37	0.71	-0.05	0.08	0.12	0.05	0.05	0.70	1.43
		W4H at Baseline	0.00	0.01	0.06	0.41	0.68	-0.01	0.01	0.09	0.06	0.06	0.89	1.12
2	1	(Constant)	0.01	0.47		0.02	0.98	-0.93	0.95					
		SRS_T_TOTAL	0.00	0.00	-0.11	-0.79	0.43	-0.01	0.01	-0.08	-0.11	-0.11	0.97	1.04
		EDEQ_Global	0.03	0.03	0.12	0.85	0.40	-0.03	0.08	0.12	0.11	0.11	0.86	1.16
		W4H at Baseline	0.00	0.01	0.06	0.39	0.70	-0.01	0.01	0.09	0.05	0.05	0.89	1.12
3	1	(Constant)	-0.10	0.45		-0.23	0.82	-1.00	0.79					
		SRS_T_TOTAL	0.00	0.00	-0.05	-0.34	0.73	-0.01	0.00	-0.02	-0.05	-0.05	0.94	1.06
		EDEQ_Global	0.02	0.03	0.11	0.78	0.44	-0.04	0.08	0.12	0.11	0.10	0.84	1.19
		W4H at Baseline	0.00	0.01	0.05	0.35	0.73	-0.01	0.01	0.09	0.05	0.05	0.88	1.14
4	1	(Constant)	0.36	0.47		0.77	0.45	-0.58	1.30					
		SRS_T_TOTAL	-0.01	0.00	-0.29	-2.16	0.04	-0.02	0.00	-0.27	-0.28	-0.28	0.97	1.03
		EDEQ_Global	0.03	0.03	0.15	1.08	0.28	-0.03	0.09	0.12	0.15	0.14	0.87	1.15
		W4H at Baseline	0.00	0.01	0.02	0.12	0.91	-0.01	0.01	0.09	0.02	0.02	0.88	1.14
5	1	(Constant)	-0.28	0.44		-0.64	0.53	-1.17	0.61					
		SRS_T_TOTAL	0.00	0.00	0.12	0.79	0.43	0.00	0.01	0.14	0.11	0.11	0.85	1.17
		EDEQ_Global	0.01	0.03	0.06	0.38	0.71	-0.05	0.07	0.12	0.05	0.05	0.77	1.29
		W4H at Baseline	0.00	0.01	0.06	0.40	0.69	-0.01	0.01	0.09	0.05	0.05	0.89	1.12
6	1	(Constant)	-0.04	0.45		-0.08	0.94	-0.93	0.86					
		SRS_T_TOTAL	0.00	0.00	-0.11	-0.77	0.44	-0.01	0.01	-0.06	-0.10	-0.10	0.93	1.08
		EDEQ_Global	0.03	0.03	0.13	0.87	0.39	-0.03	0.08	0.12	0.12	0.12	0.85	1.18
		W4H at Baseline	0.00	0.01	0.07	0.46	0.65	-0.01	0.01	0.09	0.06	0.06	0.89	1.13
7	1	(Constant)	-0.15	0.46		-0.32	0.75	-1.06	0.77					
		SRS_T_TOTAL	0.00	0.00	-0.01	-0.06	0.95	-0.01	0.01	0.03	-0.01	-0.01	0.90	1.11
		EDEQ_Global	0.02	0.03	0.10	0.70	0.49	-0.04	0.08	0.12	0.10	0.09	0.82	1.22
		W4H at Baseline	0.00	0.01	0.06	0.39	0.70	-0.01	0.01	0.09	0.05	0.05	0.89	1.12
8	1	(Constant)	0.07	0.49		0.14	0.89	-0.92	1.06					
		SRS_T_TOTAL	0.00	0.00	-0.12	-0.86	0.40	-0.01	0.01	-0.10	-0.12	-0.12	0.94	1.06
		EDEQ_Global	0.03	0.03	0.13	0.88	0.38	-0.03	0.08	0.12	0.12	0.12	0.85	1.18
		W4H at Baseline	0.00	0.01	0.03	0.23	0.82	-0.01	0.01	0.09	0.03	0.03	0.86	1.16
9	1	(Constant)	-0.20	0.48		-0.42	0.68	-1.16	0.76					
		SRS_T_TOTAL	0.00	0.00	0.03	0.18	0.86	-0.01	0.01	0.05	0.03	0.02	0.86	1.17
		EDEQ_Global	0.02	0.03	0.09	0.60	0.55	-0.04	0.08	0.12	0.08	0.08	0.78	1.29
		W4H at Baseline	0.00	0.01	0.06	0.42	0.68	-0.01	0.01	0.09	0.06	0.06	0.84	1.19
10	1	(Constant)	-0.18	0.47		-0.38	0.71	-1.12	0.77					
		SRS_T_TOTAL	0.00	0.01	0.01	0.09	0.93	-0.01	0.01	0.04	0.01	0.01	0.92	1.08
		EDEQ_Global	0.02	0.03	0.10	0.66	0.51	-0.04	0.08	0.12	0.09	0.09	0.83	1.21
		W4H at Baseline	0.00	0.01	0.06	0.39	0.70	-0.01	0.01	0.09	0.05	0.05	0.89	1.12
Pooled	1	(Constant)	-0.08	0.51		-0.16	0.88	-1.08	0.92					
		SRS_T_TOTAL	0.00	0.01		-0.25	0.81	-0.01	0.01	-0.02	-0.05	-0.05		
		EDEQ_Global	0.02	0.03		0.69	0.49	-0.04	0.08	0.12	0.10	0.10		
		W4H at Baseline	0.00	0.01		0.35	0.72	-0.01	0.01	0.09	0.05	0.05		

Appendix 2.3

Regression models conducted for the change in parent mentalisation variables (Change in DERS Lack of Clarity) at different imputation steps.

Model Summary[b]

Imputation Number	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				Durbin-Watson
						R Square Change	F Change	df1	df2	Sig. F Change	
Original data	1	.147[a]	.022	-.133	1.61439	.022	.139	3	19	.935	1.894
1	1	.250[a]	.062	.010	2.05333	.062	1.199	3	54	.319	2.325
2	1	.163[a]	.026	-.028	2.09237	.026	.490	3	54	.691	2.368
3	1	.202[a]	.041	-.012	2.07683	.041	.767	3	54	.517	2.401
4	1	.159[a]	.025	-.029	2.09375	.025	.465	3	54	.708	2.325
5	1	.155[a]	.024	-.030	2.09487	.024	.446	3	54	.721	2.341
6	1	.191[a]	.036	-.017	2.08159	.036	.682	3	54	.567	2.353
7	1	.150[a]	.022	-.032	2.09669	.022	.414	3	54	.744	2.359
8	1	.188[a]	.035	-.018	2.08276	.035	.661	3	54	.580	2.289
9	1	.220[a]	.049	-.004	2.06850	.049	.919	3	54	.438	2.330
10	1	.211[a]	.044	-.009	2.07309	.044	.835	3	54	.480	2.332

a. Predictors: (Constant), W4H at Baseline, SRS_T_TOTAL, EDEQ_Global

b. Dependent Variable: DERS_Clarity_P_Change_T1_T5

ANOVA[a]

Imputation Number	Model		Sum of Squares	df	Mean Square	F	Sig.
Original data	1	Regression	1.090	3	.363	.139	.935[b]
		Residual	49.519	19	2.606		
		Total	50.609	22			
1	1	Regression	15.172	3	5.057	1.199	.319[b]
		Residual	227.673	54	4.216		
		Total	242.845	57			
2	1	Regression	6.432	3	2.144	.490	.691[b]
		Residual	236.413	54	4.378		
		Total	242.845	57			
3	1	Regression	9.931	3	3.310	.767	.517[b]
		Residual	232.914	54	4.313		
		Total	242.845	57			
4	1	Regression	6.120	3	2.040	.465	.708[b]
		Residual	236.725	54	4.384		
		Total	242.845	57			
5	1	Regression	5.868	3	1.956	.446	.721[b]
		Residual	236.977	54	4.388		
		Total	242.845	57			
6	1	Regression	8.862	3	2.954	.682	.567[b]
		Residual	233.983	54	4.333		
		Total	242.845	57			
7	1	Regression	5.454	3	1.818	.414	.744[b]
		Residual	237.390	54	4.396		
		Total	242.845	57			
8	1	Regression	8.599	3	2.866	.661	.580[b]
		Residual	234.246	54	4.338		
		Total	242.845	57			
9	1	Regression	11.795	3	3.932	.919	.438[b]
		Residual	231.050	54	4.279		
		Total	242.845	57			
10	1	Regression	10.768	3	3.589	.835	.480[b]
		Residual	232.077	54	4.298		
		Total	242.845	57			

a. Dependent Variable: DERS_Clarity_P_Change_T1_T5

b. Predictors: (Constant), W4H at Baseline, SRS_T_TOTAL, EDEQ_Global

Imputation Number	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
			B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
Original data	1	(Constant)	0.49	4.16		0.12	0.91	-8.21	9.20					
		SRS_T_TOTAL	-0.01	0.04	-0.06	-0.25	0.81	-0.10	0.08	-0.03	-0.06	-0.06	0.93	1.07
		EDEQ_Global	0.10	0.27	0.10	0.39	0.70	-0.45	0.66	0.12	0.09	0.09	0.74	1.35
		W4H at Baseline	0.01	0.04	0.07	0.26	0.80	-0.08	0.10	0.11	0.06	0.06	0.78	1.28
1	1	(Constant)	-4.21	3.15		-1.34	0.19	-10.52	2.11					
		SRS_T_TOTAL	0.05	0.03	0.23	1.52	0.13	-0.02	0.11	0.21	0.20	0.20	0.77	1.29
		EDEQ_Global	-0.11	0.22	-0.08	-0.52	0.60	-0.54	0.32	0.07	-0.07	-0.07	0.70	1.43
		W4H at Baseline	0.04	0.04	0.15	1.05	0.30	-0.03	0.11	0.15	0.14	0.14	0.89	1.12
2	1	(Constant)	-1.20	3.17		-0.38	0.71	-7.55	5.16					
		SRS_T_TOTAL	-0.01	0.03	-0.07	-0.49	0.63	-0.07	0.04	-0.05	-0.07	-0.07	0.97	1.04
		EDEQ_Global	0.06	0.20	0.04	0.29	0.78	-0.34	0.45	0.07	0.04	0.04	0.86	1.16
		W4H at Baseline	0.03	0.04	0.14	0.96	0.34	-0.04	0.10	0.15	0.13	0.13	0.89	1.12
3	1	(Constant)	-0.80	3.00		-0.27	0.79	-6.81	5.21					
		SRS_T_TOTAL	-0.02	0.02	-0.14	-1.03	0.31	-0.05	0.02	-0.13	-0.14	-0.14	0.94	1.06
		EDEQ_Global	0.09	0.20	0.07	0.45	0.66	-0.31	0.49	0.07	0.06	0.06	0.84	1.19
		W4H at Baseline	0.03	0.04	0.12	0.85	0.40	-0.04	0.10	0.15	0.12	0.11	0.88	1.14
4	1	(Constant)	-1.22	3.29		-0.37	0.71	-7.80	5.37					
		SRS_T_TOTAL	-0.01	0.03	-0.06	-0.41	0.68	-0.07	0.04	-0.06	-0.06	-0.06	0.97	1.03
		EDEQ_Global	0.05	0.20	0.04	0.27	0.79	-0.34	0.45	0.07	0.04	0.04	0.87	1.15
		W4H at Baseline	0.03	0.04	0.13	0.90	0.37	-0.04	0.10	0.15	0.12	0.12	0.88	1.14
5	1	(Constant)	-2.26	3.01		-0.75	0.46	-8.31	3.78					
		SRS_T_TOTAL	0.01	0.02	0.05	0.33	0.74	-0.04	0.06	0.07	0.05	0.05	0.85	1.17
		EDEQ_Global	0.01	0.21	0.01	0.07	0.95	-0.40	0.43	0.07	0.01	0.01	0.77	1.29
		W4H at Baseline	0.03	0.04	0.14	0.96	0.34	-0.04	0.10	0.15	0.13	0.13	0.89	1.12
6	1	(Constant)	-2.87	3.00		-0.96	0.34	-8.88	3.15					
		SRS_T_TOTAL	0.03	0.03	0.12	0.90	0.37	-0.03	0.08	0.15	0.12	0.12	0.93	1.08
		EDEQ_Global	0.00	0.20	0.00	0.00	1.00	-0.40	0.40	0.07	0.00	0.00	0.85	1.18
		W4H at Baseline	0.03	0.04	0.13	0.89	0.38	-0.04	0.10	0.15	0.12	0.12	0.89	1.13
7	1	(Constant)	-1.75	3.09		-0.57	0.57	-7.95	4.44					
		SRS_T_TOTAL	0.00	0.03	-0.02	-0.13	0.90	-0.06	0.05	0.01	-0.02	-0.02	0.90	1.11
		EDEQ_Global	0.05	0.20	0.03	0.23	0.82	-0.36	0.45	0.07	0.03	0.03	0.82	1.22
		W4H at Baseline	0.03	0.04	0.14	0.97	0.34	-0.04	0.11	0.15	0.13	0.13	0.89	1.12
8	1	(Constant)	-0.36	3.33		-0.11	0.91	-7.04	6.32					
		SRS_T_TOTAL	-0.02	0.03	-0.12	-0.86	0.39	-0.08	0.03	-0.12	-0.12	-0.12	0.94	1.06
		EDEQ_Global	0.08	0.20	0.06	0.38	0.70	-0.32	0.47	0.07	0.05	0.05	0.85	1.18
		W4H at Baseline	0.03	0.04	0.11	0.80	0.43	-0.04	0.10	0.15	0.11	0.11	0.86	1.16
9	1	(Constant)	0.00	3.19		0.00	1.00	-6.40	6.40					
		SRS_T_TOTAL	-0.02	0.02	-0.18	-1.22	0.23	-0.06	0.02	-0.16	-0.16	-0.16	0.86	1.17
		EDEQ_Global	0.13	0.21	0.10	0.63	0.53	-0.28	0.54	0.07	0.09	0.08	0.78	1.29
		W4H at Baseline	0.02	0.04	0.09	0.64	0.52	-0.05	0.10	0.15	0.09	0.09	0.84	1.19
10	1	(Constant)	-3.55	3.15		-1.13	0.27	-9.87	2.77					
		SRS_T_TOTAL	0.04	0.03	0.16	1.12	0.27	-0.03	0.10	0.16	0.15	0.15	0.92	1.08
		EDEQ_Global	-0.02	0.20	-0.02	-0.10	0.92	-0.42	0.38	0.07	-0.01	-0.01	0.83	1.21
		W4H at Baseline	0.03	0.04	0.14	0.98	0.33	-0.04	0.10	0.15	0.13	0.13	0.89	1.12
Pooled	1	(Constant)	-1.82	3.46		-0.53	0.60	-8.63	4.99					
		SRS_T_TOTAL	0.00	0.04		0.06	0.96	-0.07	0.08	0.01	-0.004	-0.004		
		EDEQ_Global	0.03	0.21		0.16	0.88	-0.39	0.45	0.07	0.02	0.02		
		W4H at Baseline	0.03	0.04		0.89	0.37	-0.04	0.10	0.15	0.12	0.12		

Appendix 3

Regression models conducted for the change in adolescent mentalisation (DERS Lack of Emotional Clarity) at different imputation steps.

Model Summary[b]

Imputation Number	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
						R Square Change	F Change	df1	df2	Sig. F Change	
Original data	1	.392[a]	.153	.020	5.94654	.153	1.148	3	19	.355	1.734
1	1	.221[a]	.049	.022	6.97711	.049	1.814	3	106	.149	2.205
2	1	.320[a]	.103	.077	6.21973	.103	4.039	3	106	.009	2.206
3	1	.303[a]	.092	.066	5.48837	.092	3.572	3	106	.017	2.215
4	1	.098[a]	.010	-.018	5.25390	.010	.345	3	106	.793	2.130
5	1	.433[a]	.188	.165	5.32282	.188	8.171	3	106	<.001	1.996
6	1	.119[a]	.014	-.014	5.26271	.014	.504	3	106	.680	2.068
7	1	.259[a]	.067	.040	5.63907	.067	2.532	3	106	.061	1.859
8	1	.132[a]	.017	-.010	6.00169	.017	.624	3	106	.601	2.147
9	1	.323[a]	.104	.079	5.41134	.104	4.117	3	106	.008	2.093
10	1	.523[a]	.274	.253	5.74557	.274	13.303	3	106	<.001	1.936

a. Predictors: (Constant), W4H at Baseline, SRS_T_TOTAL, EDEQ_Global
b. Dependent Variable: DERS_YP_Clarity_T1_T5_Change

ANOVA[a]

Imputation Number	Model		Sum of Squares	df	Mean Square	F	Sig.
Original data	1	Regression	121.786	3	40.595	1.148	.355[b]
		Residual	671.866	19	35.361		
		Total	793.652	22			
1	1	Regression	264.935	3	88.312	1.814	.149[b]
		Residual	5160.083	106	48.680		
		Total	5425.018	109			
2	1	Regression	468.736	3	156.245	4.039	.009[b]
		Residual	4100.613	106	38.685		
		Total	4569.349	109			
3	1	Regression	322.751	3	107.584	3.572	.017[b]
		Residual	3192.956	106	30.122		
		Total	3515.707	109			
4	1	Regression	28.567	3	9.522	.345	.793[b]
		Residual	2925.969	106	27.603		
		Total	2954.536	109			
5	1	Regression	694.516	3	231.505	8.171	<.001[b]
		Residual	3003.240	106	28.332		
		Total	3697.757	109			
6	1	Regression	41.879	3	13.960	.504	.680[b]
		Residual	2935.786	106	27.696		
		Total	2977.665	109			
7	1	Regression	241.554	3	80.518	2.532	.061[b]
		Residual	3370.706	106	31.799		
		Total	3612.259	109			
8	1	Regression	67.471	3	22.490	.624	.601[b]
		Residual	3818.154	106	36.020		
		Total	3885.625	109			
9	1	Regression	361.636	3	120.545	4.117	.008[b]
		Residual	3103.959	106	29.283		
		Total	3465.595	109			
10	1	Regression	1317.479	3	439.160	13.303	<.001[b]
		Residual	3499.222	106	33.012		
		Total	4816.701	109			

a. Dependent Variable: DERS_YP_Clarity_T1_T5_Change
b. Predictors: (Constant), W4H at Baseline, SRS_T_TOTAL, EDEQ_Global

			Unstandardized Coefficients					95.0% Confidence Interval for B		Correlations			Colinearity Statistics	
Imputation Number	Model		B	Std. Error	Standardized Coefficients Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
Original data	1	(Constant)	-1.81	15.4		-0.12	0.91	-33.98	30.4					
		SRS_T_TOTAL	0.01	0.16	0.02	0.08	0.94	-0.32	0.35	0.07	0.02	0.02	0.98	1.02
		EDEQ_Global	1.50	0.89	0.40	1.69	0.11	-0.36	3.35	0.39	0.36	0.36	0.79	1.26
		W4H at Baseline	-0.02	0.16	-0.03	-0.11	0.92	-0.35	0.32	0.15	-0.02	-0.02	0.80	1.25
1	1	(Constant)	7.73	7.16		1.08	0.28	-6.46	21.9					
		SRS_T_TOTAL	-0.13	0.07	-0.20	-1.89	0.06	-0.27	0.01	-0.22	-0.18	-0.18	0.81	1.24
		EDEQ_Global	-0.21	0.49	-0.05	-0.44	0.66	-1.18	0.76	-0.13	-0.04	-0.04	0.73	1.38
		W4H at Baseline	0.01	0.08	0.02	0.16	0.88	-0.15	0.17	-0.04	0.02	0.02	0.87	1.15
2	1	(Constant)	11.42	6.51		1.75	0.08	-1.49	24.3					
		SRS_T_TOTAL	-0.19	0.06	-0.33	-3.40	<.001	-0.30	-0.08	-0.32	-0.31	-0.31	0.92	1.09
		EDEQ_Global	0.10	0.42	0.03	0.25	0.81	-0.72	0.92	-0.07	0.02	0.02	0.80	1.25
		W4H at Baseline	-0.01	0.07	-0.01	-0.11	0.91	-0.15	0.14	-0.01	-0.01	-0.01	0.87	1.16
3	1	(Constant)	2.71	5.27		0.51	0.61	-7.74	13.2					
		SRS_T_TOTAL	-0.08	0.03	-0.25	-2.69	0.01	-0.14	-0.02	-0.23	-0.25	-0.25	0.99	1.01
		EDEQ_Global	0.68	0.35	0.19	1.92	0.06	-0.02	1.38	0.17	0.18	0.18	0.87	1.16
		W4H at Baseline	0.01	0.06	0.01	0.14	0.89	-0.12	0.14	0.07	0.01	0.01	0.87	1.15
4	1	(Constant)	1.27	5.66		0.22	0.82	-9.95	12.5					
		SRS_T_TOTAL	0.01	0.04	0.01	0.14	0.89	-0.08	0.09	0.03	0.01	0.01	0.94	1.06
		EDEQ_Global	0.33	0.35	0.10	0.94	0.35	-0.36	1.01	0.10	0.09	0.09	0.83	1.21
		W4H at Baseline	-0.01	0.06	-0.02	-0.19	0.85	-0.13	0.11	0.02	-0.02	-0.02	0.84	1.19
5	1	(Constant)	-8.99	5.21		-1.73	0.09	-19.33	1.34					
		SRS_T_TOTAL	0.16	0.04	0.37	3.78	<.001	0.08	0.24	0.42	0.35	0.33	0.80	1.25
		EDEQ_Global	0.40	0.38	0.11	1.06	0.29	-0.35	1.14	0.28	0.10	0.09	0.72	1.39
		W4H at Baseline	0.01	0.06	0.02	0.17	0.86	-0.11	0.13	0.12	0.02	0.02	0.87	1.15
6	1	(Constant)	-2.94	5.44		-0.54	0.59	-13.73	7.85					
		SRS_T_TOTAL	0.03	0.05	0.07	0.68	0.50	-0.06	0.13	0.08	0.07	0.07	0.95	1.06
		EDEQ_Global	0.14	0.35	0.04	0.40	0.69	-0.55	0.82	0.08	0.04	0.04	0.83	1.21
		W4H at Baseline	0.04	0.06	0.06	0.61	0.54	-0.08	0.16	0.08	0.06	0.06	0.87	1.15
7	1	(Constant)	5.53	5.75		0.96	0.34	-5.87	16.9					
		SRS_T_TOTAL	-0.12	0.05	-0.25	-2.54	0.01	-0.22	-0.03	-0.20	-0.24	-0.24	0.90	1.12
		EDEQ_Global	0.63	0.38	0.17	1.65	0.10	-0.13	1.38	0.10	0.16	0.16	0.79	1.27
		W4H at Baseline	0.01	0.07	0.01	0.11	0.92	-0.12	0.14	0.05	0.01	0.01	0.87	1.15
8	1	(Constant)	-5.13	5.99		-0.86	0.39	-17.01	6.75					
		SRS_T_TOTAL	0.04	0.05	0.08	0.75	0.46	-0.06	0.13	0.09	0.07	0.07	0.94	1.07
		EDEQ_Global	0.17	0.40	0.05	0.43	0.67	-0.61	0.96	0.09	0.04	0.04	0.82	1.22
		W4H at Baseline	0.05	0.07	0.07	0.68	0.50	-0.09	0.19	0.09	0.07	0.07	0.87	1.15
9	1	(Constant)	6.91	5.53		1.25	0.22	-4.06	17.9					
		SRS_T_TOTAL	-0.12	0.04	-0.33	-3.41	<.001	-0.19	-0.05	-0.28	-0.31	-0.31	0.91	1.10
		EDEQ_Global	0.61	0.36	0.17	1.67	0.10	-0.11	1.33	0.08	0.16	0.15	0.79	1.27
		W4H at Baseline	-0.01	0.06	-0.02	-0.22	0.83	-0.14	0.11	0.05	-0.02	-0.02	0.85	1.17
10	1	(Constant)	-12.04	5.96		-2.02	0.05	-23.84	-0.23					
		SRS_T_TOTAL	0.29	0.05	0.48	5.79	<.001	0.19	0.38	0.50	0.49	0.48	0.98	1.02
		EDEQ_Global	0.64	0.37	0.15	1.73	0.09	-0.10	1.38	0.20	0.17	0.14	0.86	1.17
		W4H at Baseline	-0.04	0.07	-0.05	-0.60	0.55	-0.17	0.09	0.01	-0.06	-0.05	0.87	1.15
Pooled	1	(Constant)	0.65	9.99		0.07	0.95	-20.13	21.4					
		SRS_T_TOTAL	-0.01	0.16		-0.08	0.94	-0.37	0.35	-0.01	-0.03	-0.03		
		EDEQ_Global	0.35	0.50		0.70	0.49	-0.65	1.34	0.09	0.09	0.09		
		W4H at Baseline	0.01	0.07		0.07	0.94	-0.14	0.15	0.04	0.01	0.01		

Appendix 4

Table of Missing Data, including percentage of participants missing data, at each timepoint, for the Parent Group Study in Chapter 5.

Variable	Number of Complete Participant Data	Number of Participants Missing Data	Percentage of Participants Missing Data
Time 1 %mBMI	24	3	11
Time 2 %mBMI	21	6	22
Time 3 %mBMI	23	4	15
Time 1 EDEQS	22	5	19
Time 2 EDEQS	13	14	52
Time 3 EDEQS	11	16	59
Time 1 RFQY-5	17	10	37
Time 2 RFQY-5	13	14	52
Time 3 RFQY-5	11	16	59
Time 1 DERS Lack of Emotional Clarity (Adolescents)	18	9	33
Time 2 DERS Lack of Emotional Clarity (Adolescents)	13	14	52
Time 3 DERS Lack of Emotional Clarity (Adolescents)	11	16	59
Time 1 PRFQ Certainty about Mental States	37	1	3
Time 2 PRFQ Certainty about Mental States	33	5	13
Time 3 Certainty about Mental States	35	3	8
Time 1 PRFQ Interest and Curiosity in Mental States	37	1	3
Time 2 PRFQ Interest and Curiosity in Mental States	33	5	13
Time 3 PRFQ Interest and Curiosity in Mental States	35	3	8
Time 1 PRFQ Pre-Mentalizing Modes	37	1	3
Time 2 PRFQ Pre-Mentalizing Modes	33	5	13
Time 3 PRFQ Pre-Mentalizing Modes	35	3	8
Time 1 DERS Lack of Emotional Clarity (Parents)	38	0	0
Time 2 DERS Lack of Emotional Clarity (Parents)	33	5	13
Time 3 DERS Lack of Emotional Clarity (Parents)	35	3	8

Appendix 5

Cronbach's alphas for parent baseline variables. Numbers in brackets refer to the Cronbach's α once an item has been removed.

Scale	N	Items	Cronbach's α
PRF Pre-mentalising Modes	37	6	.489 (.550)
PRF Certainty about Mental States	37	6	.792
PRF Interest and Curiosity	36	6	.760
DERS Total	35	36	.936
DERS Non-Acceptance of Emotional Responses	37	5	.854
DERS Difficulty Engaging in Goal- Directed Behaviour	37	5	.852
DERS Impulse Control Difficulties	38	6	.784
DERS Lack of Emotional Awareness	38	6	.805
DERS Limited Access to Emotion Regulation Strategies	37	8	.842
DERS Lack of Emotional Clarity	38	5	.783
3PS-SF Rigid Perfectionism	36	4	.891
3PS-SF Self-critical Perfectionism	36	6	.820
3PS-SF Narcissistic Perfectionism	37	6	.837
GAPS	37	10	.821
2-Way Social Support Receive Emotional Support	37	7	.805
2-Way Social Support Give Emotional Support	36	5	.671
2-Way Social Support Receive Instrumental Support	37	5	.623
2-Way Social Support Give Instrumental Support	37	5	.675
AQ-10	37	10	.600

Note. Abbreviations in table: *PRFQ* Parental Reflective Functioning Questionnaire; *AQ-10* Short Autism Spectrum Quotient; *3PS-SF,* Big Three Perfectionism Scale (Short Form); *GAPS* Guilt about Parenting Scale; *DERS* Difficulties in Emotion Regulation Scale.

Appendix 6

Cronbach's alphas for adolescent baseline variables. Numbers in brackets refer to the Cronbach's α once an item has been removed.

Scale	N	Items	Cronbach's α
EDE-QS	17	12	.796
DERS Non-Acceptance of Emotional Responses	18	5	.710
DERS Difficulty Engaging in Goal- Directed Behaviour	18	5	.971
DERS Impulse Control Difficulties	18	6	.894
DERS Lack of Emotional Awareness	18	6	.034
DERS Limited Access to Emotion Regulation Strategies	18	8	.865
DERS Lack of Emotional Clarity	18	5	.896
DERS Total	18	36	.932
RFQY	17	5	.635 (.831)

Note. Abbreviations in table: *EDE-QS* Eating Disorder Examination – Questionnaire Short; *SCDC* Social and Communication Disorders Checklist; *DERS* Difficulties in Emotion Regulation Scale; *RFQ-Y* Reflective Function Questionnaire for Youth.

Appendix 7

Line graph showing mean change in PRFQ Certainty about Child's Mental States over the three study timepoints, depending on whether parents started the group with Low Certainty or High Certainty.