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How Can Social Mentality Theory Help Us Understand Eating Disorder Presentations? A Scoping Review

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Review

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Abstract

This scoping review used social mentality theory (SMT) as a framework to identify and integrate relevant eating disorder systematic reviews and meta-analyses. A systematic search of the PsycINFO database was conducted, using terms from SMT and eating disorder literature. Eighteen systematic reviews met the inclusion criteria. Findings suggest that those with eating disorders also experience a number of relationship difficulties, in childhood and/or adulthood, related to attachment style, caregiver experiences, family functioning, social rank, social cognition, and self-compassion. The identification of these social difficulties is established in the eating disorder literature. SMT can provide a theoretical framework to understand how evolved motives to relate to others may contribute to these difficulties.

The *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association, 2013) recognises four eating disorder (ED) diagnoses: anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED), and other specified feeding or eating disorder (OSFED), previously termed eating disorder not otherwise specified (EDNOS). The International Classification of Disease — Tenth Edition (ICD-10; World Health Organization, 1992) recognises AN, BN, and eating disorder unspecified (EDU). The primary features of concern for AN involve excessive food restriction and weight loss; for BN, episodes of binging and purging; and for BED, episodes of binging; while OSFED and EDU characterise clinically significant ED that do not meet criteria for another ED. A complex blend of biopsychosocial factors has been found to increase risk for, and/or contribute to, the development and maintenance of ED. These include the interactions between: (1) evolved drives for hedonic and homeostatic eating (Lutter & Nestler, 2009); (2) consequences of sustained energy deficit, which can include loss of control eating, preoccupation with food, social withdrawal and isolation, depression, difficulties in attention, comprehension and judgment (Keys, Brozek, Henshel, Mickelson, & Taylor, 1950; Polivy, Zeitlin, Herman, & Beal, 1994); (3) various physiological and psychological factors, such as excessive stress (Razzoli, Pearson, Crow, & Bartolomucci, 2017), heightened perfectionism, neuroticism, avoidance motivation, sensitivity to social reward, and lower extraversion and self-directedness (Farstad, McGeown, & von Ranson, 2016); (4) cyclical cognitive, emotional and behavioural processes (Murphy, Straebler, Cooper, & Fairburn, 2010); (5) family functioning involving heightened conflict, lower intimacy and lower democratic parenting (Bowles, Kurlender, & Hellings, 2011), and general interpersonal difficulties (Arcelus, Haslam, Farrow, & Meyer, 2013); and (6) cultural influences (Fernandez & Pritchard, 2012). ED are associated with increased risk of morbidity and mortality and reduced quality of life (Crow et al., 2009; Pohjolainen et al., 2016).

There is some evidence for multiple psychological interventions leading to weight gain and reduction of ED symptomology among adults with AN, with no single approach showing superiority (Galsworthy-Francis & Allan, 2014; Hay, 2013). Cognitive behavioural therapy (CBT) is the most evidence-based intervention for binge–purge abstinence and treatment completion among those with BN (Hay, 2013). However, at follow-up, around 50% do not experience remission from ED (Fairburn et al., 2009). Steinhausen and Weber's (2009) review found that 23% experience a chronic protracted course of BN and 22% will cross over to another ED. They report that many also have another psychiatric disorder at outcome. These outcomes highlight the need to further develop and refine theory and intervention regarding ED. The following section will discuss compassion focused therapy (CFT) and one of its underlying theories, social mentality theory (SMT), and their clinical application to ED through group intervention and compassion-focused therapy for ED (CFT-E). The article will then use SMT as a framework through which to integrate and consider systematic reviews regarding psychological ED research.

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Compassion-Focused Therapy

CFT is an integrative, transdiagnostic therapy that focuses on developing compassionate self-to-other and self-to-self relating, and as such is particularly relevant for those who experience high levels of shame and self-criticism (Gilbert, 2010). CFT theory is rooted in evolutionary psychology and affective neuroscience research, and focuses on the importance of social mentalities and emotion-regulation systems in mental health.

Social Mentality Theory

Evolved biosocial goals

Gilbert (1989, 1995, 2005) developed the term *social mentalities* to loosely describe how people become mentally and physically organised in terms of attention, emotion, cognitive processing styles and behaviour, in order to engage in certain types of relationships that are guided by evolved biosocial goals. Examples of such goals include care-giving, care-receiving, cooperation, mating, and competition/social ranking (Buss, 2005). SMT is concerned with the behavioural strategies used to achieve these goals, the emotional experience of meeting, trying to meet, or failing to meet these goals, and the cognitive capacities humans have developed in line with these goals (Gilbert, 2014).

Early interpersonal experiences and social mentalities

Early experiences of safeness, appropriate mirroring, and warmth and care are considered to support the development of a sense of self that is safe in relationships, cared for and understood (Gilbert, 2005). These experiences are thought to set the stage for activation of the care-giving, care-receiving, and cooperative social mentalities in later life (Gilbert, 2005). Through such early experiences individuals are taught to develop regulation skills that partly involve self-soothing and soothing through social connection when threat arises (Cozolino, 2014; Gilbert, 2005; Schore, 2000). In contrast, early experiences of threat and non-investment from the care-giver may prime the individual's defence system for greater activation, contribute to the individual experiencing social interactions as threatening, and leave the individual with limited experience of social connection as soothing, and a sense that they are viewed negatively by others (Cozolino, 2014; Gilbert, 2005). In this way, insecure attachment patterns or early interpersonal trauma may create a setting for less activation of caring or cooperative mentalities and greater activation of a competitive social mentality (Gilbert et al., 2007; Matos, Ferreira, Duarte, & Pinto-Gouveia, 2014; Troop & Hiskey, 2013; Sloman & Taylor, 2016). Gilbert et al. (2009) found that those who feel unsafe in relationships and who strive to compete in social situations experience more depression, anxiety and stress. McEwan, Gilbert, and Duarte (2012) found a strong association between feeling unsuccessful in competition and depression. Within the attachment literature, research has suggested that insecure attachment style is an important risk factor for a wide range of health problems (Mikulincer & Shaver, 2012).

Emotion regulation systems and social mentalities

CFT categorises emotions by their functions for: (1) alert to threat and activation of defence behaviours, (2) incentivisation of seeking behavior, and (3) to allow for rest and digest (Gilbert, 2014). These have been named the threat system, drive system, and soothing system. For many, the soothing system is activated by social connection, during which people tend to experience peace, contentment and social safeness. The ways in which these three systems regulate each other is considered important in understanding mental health and ill health. For example, when an individual experiences threat, but is then able to activate the soothing system in the appropriate context, this is considered conducive to mental health (Gilbert, 2014). However, if an individual's threat system is activated and they struggle to regulate this through the soothing or drive systems, or if they primarily rely on the drive system for regulation, they may experience ill health.

CFT suggests that the development of a compassionate social mentality can aid in emotion regulation by developing compassionate self-to-self, self-to-other, and other-to-self relating, along with activation of the soothing system and experiences of social safeness (Gilbert, 2015).

Compassion-Focused Therapy for Eating Disorders

Through functional analysis of the three emotion systems among those with ED, Goss and Gilbert (2002) suggest two affect regulation models that may contribute to the development and maintenance of restrictive and binge/purge patterns. In both, genetics, temperament, early attachment history, experiences of rejection or abuse, and cultural messages regarding weight and shape are considered to predispose an individual to experiencing high levels of shame, contributing to the development of an ED. In restrictive eating cycles, the experience of excessive shame may drive a focus toward body image and weight control, in line with cultural messages, in order to defend against negative social outcomes. When control is successful they may experience pride; when it is unsuccessful, more shame. In this way, restriction is reinforced positively by pride, and negatively by avoidance of shame, that is, a shame-pride cycle (Goss & Gilbert, 2002). In binge cycles, experiences of shame are proposed to contribute to affect instability, particularly in interpersonal contexts. This leads to the use of binging for short-term affect management, which may be reinforced by dissociation from negative feelings and a potential increase in positive feelings. In the long run, binging is thought to lead to fear of discovery, concealment and self-disgust, contributing to greater shame, that is, a shame-shame cycle (Goss & Gilbert, 2002).

Goss and Allan (2010) integrated elements of CFT into an existing CBT group intervention for those with ED, from which they have developed CFT-E. CFT-E suggests that the efficacy of existing therapies is limited by the individual experiencing heightened levels of threat and difficulties in accessing the social soothing system. Thus, a key aim is to help the individual increase access to this system through the practice of compassionate self-to-self, self-to-other, and other-to-self relating. Gale, Gilbert, Read, and Goss (2014) report that 73% of those with BN, 30% of those with EDNOS, and 21% of those with AN were considered recovered after a CFT-E intervention. An RCT comparing CFT-E and CBT-E is currently underway, with a specific focus on the relevance of early trauma on outcomes in each group (Vrabel, 2016).

There is emerging evidence to suggest that ED difficulties can be conceptualised through a SMT framework. High levels of unfavourable social rank perceptions, insecure striving, and social comparison among those with ED may suggest a heightened competitive social mentality (Matos et al., 2014; Pinto-Gouveia, Ferreira, & Duarte, 2014). Furthermore, initial decreases in shame during treatment are associated with faster decreases in ED symptomology, highlighting the importance of targeting shame in ED treatment (Kelly, Carter, & Borairi, 2014).

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The Present Review

There is emerging evidence to suggest that ED difficulties can be conceptualised through a SMT framework. High levels of unfavourable social rank perceptions, insecure striving, and social comparison among those with ED may suggest a heightened competitive social mentality (Matos et al., 2014; Pinto-Gouveia et al., 2014). There are many ED theories and research streams that offer useful understanding of ED. Because SMT tries to offer a broad understanding of human functioning, it may be able to act as a meta-theory or framework within which to integrate a number of these otherwise distinct research streams. Thus, the aim of the present review is to use SMT as a framework to guide a scoping review of existing systematic reviews and meta-analyses, integrating and presenting a large body of ED research to add further understanding to existing ED research and theories.

Method

The methodology for this scoping review was based on the frameworks set out by Arksey and O'Malley (2005) and Levac, Colquhoun, and O'Brien (2010). The review involved five stages: (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data, and (5) collating, summarising and reporting results.

Research Question

The review was guided by the question, 'How does existing eating disorder (ED) research fit with Gilbert's (1989, 1995, 2005) concept of social mentalities?' A scoping review was considered appropriate as it offers a methodology to address a broad research question by systematically searching and collating a large body of research regarding a complex and heterogeneous topic (Arksey & O'Malley, 2005; Levac et al., 2010). The initial aim was to review primary research articles; however, there were a large number of systematic reviews and meta-analyses returned in the search. Given that such reviews aim to synthesise a large body of research while taking into account quality of evidence, a review of reviews was considered a useful approach in addressing the research question.

Search Strategy

A number of steps were taken in order to choose relevant search terms. First, a systematic search was carried out on Psycinfo using the term "social mentalit*", yielding 18 results. Of these, six were book chapters that were not accessible, one was a duplicate, and five were not relevant to SMT. Two further articles were identified after reviewing the reference lists of identified articles. These eight articles were reviewed and terms that were relevant to SMT were identified. These terms reflected the core concept behind SMT, that people engage in different evolved relational patterns, in particular involving care, cooperation, and competition with others and within themselves. These terms were combined with the ED search terms, "eating disorder*" or "anore*" or "bulimi*", or "binge eat*". A systematic search was then carried out on August 10, 2016, in PsycINFO. The specific searches carried out are outlined in Table 1. See Figure 1 for a flow diagram of the search process.

Table 1. Search Terms and Identified Reviews (Before Duplicates Removed)

Search	Terms ("eating disorder" or anore* or bulimi* or "binge eat") AND:	Total	English, peer reviewed, adolescents and adults	Systematic reviews	Systematic reviews meeting eligibility criteria
1	"care-giv*" or "care giv*" or "care-receiv*" or "care receiv*" or "care-seek" or "care seek" or "care-elicit" or "care elicit" or "self-care" or "self care" or nurtur* or "social safe*"	43	32	1	1
2	attachment	419	225	5	4
3	cooperation or co-operation or affiliation or "help* behavior" or closeness or belong* or loneliness or connect*	179	95	4	1
4	sexual or romantic or intimate or partner	1367	752	7	3
5	"social compet*" or "social rank" or dominan* or submissi* or "social status" or "social comparison" or inferior or superior or "self criticism" or "self-criticism" or "self-hostility" or "self hostility" or "shame" or "pride" or perfec*	191	124	4	1
6	Compassion or "self-compassion" or "self compassion"	55	35	2	1
7	complian* or selfless* or altruis* or prosocial or "help* behavior"	218	140	6	0
8	parent* or family	4826	2344	32	4
9	interpersonal	1193	1041	18	4
10	"mentalis*" or "mentaliz*" or empathy or "social cognition" or "theory of mind" or "reflective function*" or "meta-cognition" or "metacognition"	56	31	2	2
Total		8547	4819	81	21

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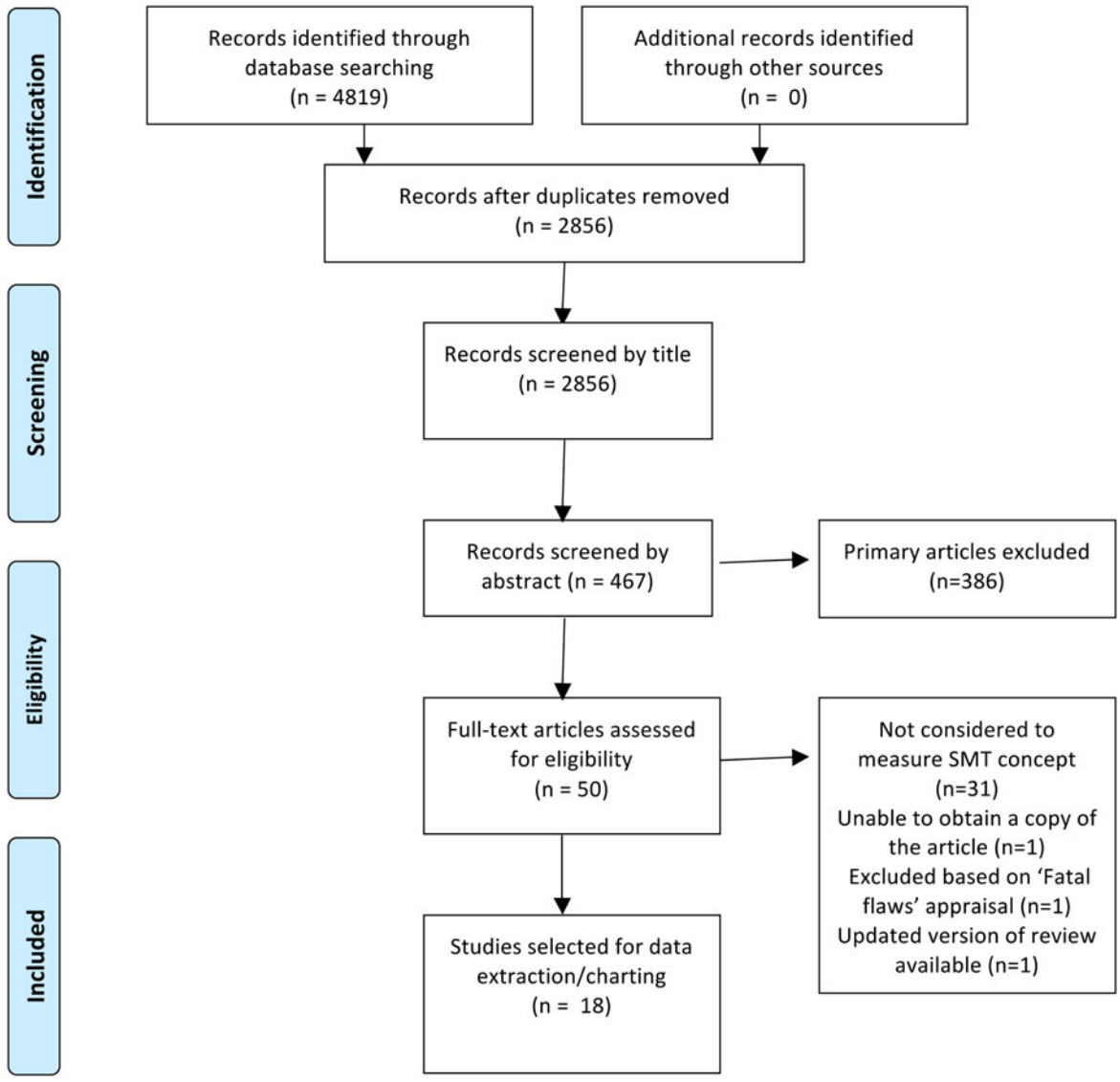


Fig. 1. Flow diagram of study selection process.

Eligibility Criteria

The following eligibility criteria guided study selection. Two reviewers independently reviewed search results according to the eligibility criteria below. The key search terms guided decisions as to whether a concept relevant to SMT was addressed. Where reviewers were unsure, this was discussed with reference to key SMT texts, and a joint decision was made to include or exclude the study. The eligibility criteria were: (1) English language; (2) peer-reviewed journal articles; (3) systematic reviews or meta-analyses; (4) adult or adolescent participants who met the diagnosis for ED or experiencing clinical ED symptoms; where all participants were non-clinical, the study was excluded; where all participants were children, the study was excluded; (5) quantitative or qualitative data regarding a concept considered relevant to SMT. Studies that focused exclusively on intervention outcome were excluded.

Quality Check Framework

There are mixed views regarding the need to appraise study quality in scoping reviews (Arksey & O'Malley, 2005; Levac et al., 2010). By their nature, systematic reviews and meta-analyses generally select high quality studies to synthesise. However, to ensure a basic level of quality appraisal in this review, Dixon-Woods et al.'s (2006) 'fatal flaws' criteria were applied. This criteria asks: Are the aims and objectives of the research clearly stated? Is the research design clearly specified and appropriate for the aims and objectives of the research? Do the researchers display enough data to support their interpretations and conclusions? Do the researchers provide a clear account of the process by which their findings were produced? Is the method of analysis appropriate and adequately explicated? Only one study was judged of poor quality and excluded. The quality of remaining reviews was assessed by whether they applied the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) or similar guidelines, how they considered biases in primary studies, and whether they considered these in reporting of their findings.

Data Extraction

A form was developed to extract study characteristics, including authors, publication year, study design, participant characteristics, measure of ED, measure of SMT concept, and relevant finding(s).

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Data Summary and Synthesis

The above information was then presented in Tables 2 and 3, with an accompanying narrative. These findings were then considered, using SMT as a framework through which to interpret the findings.

Results

Methodological Characteristics

Eighteen systematic reviews were included; of these, five conducted meta-analyses. The methodological characteristics and key relevant finding(s) of included reviews are presented in Table 2. Reviews were published between 2001 and 2016, 17 of which were between 2012 and 2016. Reported pooled sample sizes ranged from 233 to 22,853. Ten reviews reported information regarding age. Of these, seven included adolescent and adult populations, one included children and adolescents, and two included only adults. The oldest reported mean age was 44 years. Ten reviews reported gender. The majority of participants was female. Seven reviews reported male participants. Four of these consisted of less than 10% males. Three reviews that investigated father-child relationships and romantic relationships included more male participants without ED. Almost all explicitly stated review aims and all reported eligibility criteria. Of these, 12 reported only including English language studies, one reported the inclusion of Spanish language, and one reported no language restriction. All measured ED by either diagnosis or a validated measure of ED symptomology. All reported on multiple ED diagnoses, while most attempted to separate findings according to diagnosis. Eight studies reported following PRISMA guidelines (Reviews [R] 1, 2, 3, 4, 8, 10, 11, 12, 13, 15). Four studies reported using alternative review guidelines or tools to appraise quality of primary studies (R 7, 9, 13, 15). Five studies did not report following guidelines or detailed appraisal of quality of the primary studies beyond meeting eligibility criteria and limited consideration in the discussion (R 5, 6, 14, 16, 18).

Measurement of social mentality theory concepts

Various measures were used to address the concepts considered relevant to SMT. These are listed in Table 3, with a brief description regarding measurement. The majority of measures were observational or experimental for theory of mind, social cognition and mentalisation, and self-report for other constructs. Interview and coding forms of measurement were also used in attachment research.

Overview of Findings

The identified reviews covered a number of concepts considered relevant to SMT. These included attachment style and experiences of parental bonding (K = 4), family functioning (K = 3), caregiving to those with ED (K = 1), childhood emotional, physical and sexual abuse (K = 1), social competition (K = 1), social cognition (K = 4), interpersonal functioning (K = 6), and self-compassion (K = 1). Some studies covered more than one relevant concept.

Attachment and parental bonding

The findings suggest that those with ED are likely to experience insecure attachment styles, and report lower parental care and greater parental over-protection compared to healthy controls (R1, R5, R6). R5 and R9 propose that maladaptive perfectionism and emotion regulation may be such mechanisms. There is some evidence that attachment style may also contribute to the efficacy of certain interventions. R5 reported that avoidance has been associated with greater drop out, and better treatment outcomes have been observed among those with attachment anxiety in interpersonal group therapy.

Family functioning and care-giving experiences

Families of those with ED report poorer family functioning than healthy controls (R10, R12). No specific style of dysfunction was observed generally, or between diagnoses (R10). Those with ED perceived worse family functioning than other family members (R10). Those who reported better family functioning generally experienced better treatment outcomes, with a small to moderate effect (R12). Gale, Cluett, and Laver-Bradbury's (2013) qualitative review (R9) suggests that unresolved conflict, conflictual communication, and communication that fosters rigidity and conformity between father and child may present a risk factor for the development of ED. R8 found that care-givers of people with ED reported experiencing difficulties in their role, with high levels of enabling behaviours, expressed emotion, and psychological distress. Participants caring for individuals with a longer illness duration reported greater care-giving burden. However, some participants also report positive aspects of care-giving likely related to the positive aspects of their relationship (R8).

Child abuse

Those with any ED were 3.21 times more likely to have experienced any child abuse compared to community samples (R11). A consistent significant association was not found between AN and child sexual abuse (CSA), while those with BN and BED were 2.73 and 2.31 times more likely, respectively, to have experienced CSA (R11). Child physical abuse (CPA) was 3.31 times more likely among AN, 2.65 times more likely among BN, and 3.1 times more likely among BED (R11). Childhood emotional abuse (CEA) was 4.15 times more likely among BN and 3.7 times more likely among BED (R11).

Interpersonal functioning

Relationship difficulties in adulthood were reported in multiple reviews (R12, 13, 14, 15, 16, 17). Arcelus et al.'s (2013) review suggest that the most prevailing interpersonal difficulties for those with restrictive symptomology are a fear of negative evaluation and of expressing emotions, while interpersonal distrust and conflictual interactions are most reported for those with binge/purge symptomology. These experiences are thought to contribute to social anxiety and fear of intimacy, and subsequently, poorer emotional support (R13).

Pretreatment interpersonal problems were associated with poorer treatment outcome (R5, R12, R14), with a small effect size (R12). In line with Tasca and Balfour's (2014; R5) finding regarding avoidance, anxiety and treatment outcome, Jones, Lindekilde, Lubeck, and Clausen (2015; R14) highlight that social avoidance may be somewhat detrimental for outcome potentially by contributing to poorer therapeutic relationship and social support. In contrast, social anxiety may improve treatment outcome for some, where need for positive appraisal may contribute to treatment completion. Note that R5 and R14 are reviews that did not report a detailed quality appraisal. A small positive association between interpersonal dependency and ED was identified, with higher levels reported as people experience higher levels of

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Table 2. Overview of Review Characteristics and Relevant Findings

Review number	Concepts reviewed related to social mentality theory	Author, year; design; number of studies	Sample	Mean age	Gender	ED diagnoses	Review aims	Eligibility criteria	Quality check	Relevant findings
1	1. Attachment and affiliation 2. Understanding of others' mental states 3. Alexithymia 4. Social dominance	Caglar-Nazali et al. (2014) Systematic review and meta-analysis	1. K = 36 *N* = 5,405 (ED = 2,358) (HC = 3047) 2. K = 22 *N* = 1,766 (ED = 934) (HC = 832) 3. K = 32 *N* = 3,532 (ED = 1620) (HC = 1,912) 4. K = 8 *N* = 5,604 (ED = 952) (HC = 4652)	M = 24.1 R = 13.6-36	NR	AN BN ED BED AN-Rec	To conduct a systematic review and meta-analysis of literature related to psychopathology of ED based on the constructs within the NIMH RDoC domain of 'Systems for Social Processes'.	• Studies investigating a construct/ subconstruct within the NIMH RDoC 'Systems for Social Processes' domain, • Including a clinical sample of people with ED diagnosed with a clinical instrument (participants with comorbidity included) • Including a health control comparison group who never suffered from an ED or any psychiatric condition (minimum of 15 participants per control group). • Report standard quantitative information based on self-report or behavioral instruments related to the constructs of interest	Author's consisted of a large research team who report a number of consensus meetings in the planning and execution of the review. Authors report following PRISMA guidelines. Tested for publication bias and performed trim and fill method to adjust effect size.	1. Those with ED are more likely to experience insecure attachment than healthy controls (d = 1.13), and to report lower perceived parental care (d = 0.51) and greater parental overprotection (d = 0.14) 2. After correcting for publication bias, there was a small effect for poorer understanding of mental states by those with ED (d = 0.32), as measured by experimental tasks. Some evidence of poorer self-reported understanding of mental states by those with ED, compared to controls. 3. Those with ED had higher levels of alexithymia with a large effect (d = 0.99) 4. Those with ED report experiencing greater feelings of social inferiority than healthy controls, with a large effect size (d = 1.08). One primary study measured high levels of social comparison.
2	Theory of mind (ToM)	Bora & Kose (2016) Meta-analysis	K = 15 *N* = 1,191 (ED = 677) (HC = 514)	M = 25.6 R = 14.9-29	All female	AN BN AN-Rec	1. To investigate ToM abilities and their relationship with demographic and clinical variables in ED. 2. To compare the severity of ToM deficits in AN and BN.	• Compared ToM performances of females with ED and HC • Having a diagnosis of AN, BN, or EDNOS-bulimic type • Reporting sufficient data to calculate the effect size • Studies with male participants and EDNOS- subtype not clarified were excluded	Authors report following PRISMA guidelines. Specifically, authors assessed primary study quality by peer review status, medium of publication, diagnostic procedure and procedure for performing social cognitive tests in MRI studies.	Overall, ToM was significantly impaired in ED (d = 0.50). Large deficits were observed in perspective taking and decoding ToM in acute AN (d = 0.67). Small deficits were observed in recovered AN (d = 0.34). In BN there were modest impairments for decoding (d = 0.33), but no significant impairment in perspective taking. Longer duration of illness, lower BMI and depressive symptoms were associated with greater deficits in ToM.
3	1. Attachment (findings not reported here as participants were predominantly children) 2. Mentalisation	Jewell et al. (2016) Systematic review	2. K = 7 *N* = 541 (ED = 318) (HC = 223)	*M* = 15.57 R = 10.3-21.3	2. All female (K = 4), not reported (K = 3)	AN BN EDNOS 1 High risk for ED sample	A review of studies of child and adolescent eating pathology and its association with attachment and mentalization to inform etiological models of ED.	• Published studies in English • A measure of eating pathology, attachment, and mentalisation • Including participants who were children or adolescents, with an upper age limit of 20 years • Case studies and studies of obesity excluded	Authors report following PRISMA guidelines. Authors used a critical appraisal checklist that assessed representativeness of sample, acceptability of control group, quality of the measure of eating pathology, quality of the measure, attrition, and blindness of assessors where relevant. A risk of bias was identified among primary articles due to a non-consecutive sampling approach in clinical samples and use of poorly validated measures. Not all studies included a comparison group.	Mentalising difficulties and eating pathology were correlated in all seven studies. An association was observed in one primary study that measured both attachment and mentalising.

4	Social cognition	DeJong et al. (2013) Systematic review	K = 5 *N* = 546 (BN = 187) (EDNOS-BN = 34) (HC = 325)	M = 24.98 R = 19.3–28.5	NR	BN EDNOS-BN	To systematically review studies of social cognition, and to evaluate whether social cognitive deficits exist in BN.	• Peer-reviewed published studies in English • A DSM-IV or ICD-10 diagnosis of BN or EDNOS-BN • Presence of a HC comparison group • Sufficient information reported to analyse results for BN /EDNOS-BN alone • Use of a behavioural task to measure SC	Authors report following PRISMA guidelines. Use of behavioral measure to avoid low measure of self-report SC which may be due to negative self-concept.	BN participants showed poorer levels of emotional awareness on one task in one study, however it is not clear whether this was related to naming one's own emotions, or perspective taking. Two studies showed no difference using the Reading the Mind in the Eyes task. In one study, the BN group showed greater attentional bias to angry facial expressions. Mixed findings were identified for facial expression recognition in two studies.
5	Attachment	Tasca & Balfour (2014) Systematic review	K = 32 *N* = NR	NR	NR	ED	To provide a review of the current state of attachment research in ED, for both self-report and AAI measures in relation to the following domains: (1) prevalence of insecurity and level of reflective functioning, (2) the association between attachment insecurity and ED diagnosis or symptomology, (3) mechanisms by which attachment may affect ED, (4) associations with trauma and disorganised mental states, and (5) the impact on treatment processes and outcomes.	• English language • Empirical research with greater than six participants including adults with a diagnosis of ED between 2000-2014 • A standard and valid self-report measure of attachment or standard coding of AAI • Studies that provide findings relevant to attachment related functions of (1) affect regulation, (2) interpersonal style, (3) coherence of mind, and (4) reflective functioning.	Authors do not report following PRISMA or similar guidelines. Though 46 studies met selection criteria, only 30 were included in the narrative summary. The narrative summary was written according to four predetermined themes of affect regulation, interpersonal style, coherence of mind and reflective styles, thus a number of demographic and methodological details of primary studies were not included in this review and findings are not presented systematically.	Findings from primary studies were presented that suggest reduced mentalisation among participants with ED. Disorganised mental states were also reported among ED participants and were also prevalent among mothers in one primary study. Attachment insecurity, specifically, need for approval was reported to be associated with ED psychopathology and body dissatisfaction. Research tentatively suggests that maladaptive perfectionism and maladaptive affect regulation may partly mediate insecurity and ED symptoms. Primary studies suggest that self-reported attachment style may impact of therapy process and outcome. Avoidance was associated with greater drop-out. Better treatment outcomes were reported for those with attachment anxiety in interpersonal group therapy.
6	Attachment	Zachrisson & Skarderud (2010) Systematic review	K = 9 *N* = 233 (ED = 233)	NR	All female	ED AN AN-R AN-B BN EDNOS BED	To provide an update on theoretical and empirical developments in the field of attachment and eating disorders.	• English language • Published journal article of book • Addressing functional or etiological aspects of ED Addressing attachment in the Bowlby tradition	Authors do not report following PRISMA or similar guidelines. Authors note limitations in interpretation of findings due to variation in methods of AAI analysis and limited sample descriptions.	There is a low level of secure attachment classifications among participants with ED who have completed the AAI. Preoccupied classifications were somewhat more common among those with BN or ED with mood component, while dismissing classifications appeared slightly more common among those with AN-R.
7	Parental bonding	Tetley, Moghaddam, Dawson, & Rennoldson (2014)	K = 24 *N* = 4,492 (ED = 1,862)	R = 14.7–40.3	All female	ED	To update previous reviews on parental bonding (the parental contribution to parent-child relationships). The aims were to: (1) identify the extent to which parental bonding, as defined by Parker et al. (1979), is found to differ for people with eating disorders relative to non-clinical samples in the studies published since 1999; (2) assess the methodological quality of this research and identify what	• English language, peer-reviewed articles • Studies that assessed parental bonding, as defined by Parker et al. (1979), in people with ED before age 16 years, compared to a non-clinical group • Studies that were cross-sectional, case-control, longitudinal, or comparative twin studies.	Authors created a bespoke measure to assess for bias in primary studies addressing: (1) design issues, including validity and reliability, (2) sample representativeness, (3) confounding factors, (4) suitability of statistical methods, and (5) conflicts of interest. Most studies did not control for confounding characteristics. No studies reported whether analysis was adequately powered, 58% failed to control for type 1 errors; 17% were judged to have a high susceptibility to bias, 58% to have a medium	Women with ED generally reported lower levels of parental care and higher levels of parental protection compared to non-clinical, but not psychiatric comparison groups or between ED diagnoses. Some evidence (two out of five studies) that the schemas, vulnerability to harm, abandonment, and defectiveness, and avoidant problem social style mediate the relationship between poorer parental bonding and ED symptomology.

(*Continued*)

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Table 2. (*Continued.*)

Review number	Concepts reviewed related to social mentality theory	Author, year; design; number of studies	Sample	Mean age	Gender	ED diagnoses	Review aims	Eligibility criteria	Quality check	Relevant findings
							further research is required; and (3) identify any mediators of the relationship between parental bonding and eating disorders.		susceptibility, and 25% to have a low susceptibility.	
8	Care-giving	Anastasiadou, Medina-Pradas, Sepulveda, & Treasure (2014) Systematic review	K = 29 *N* = 4,584 (ED = 2,015) (Carer = 2569)	*M* = 20.2 R = 13.3–28	NR	AN AN-R AN-P BN EDNOS BED	To review systematically the available new evidence on family caregiving in eating disorders (ED), updating the study of Zabala, Macdonald, and Treasure (2009).	• English or Spanish language studies • Containing quantitative data related to caregiving experience, accommodation and enabling, expressed emotion, and/or psychological distress in caregivers	Authors report following PRISMA guidelines. Authors excluded some studies where there were multiple publications of the same data.	The majority of studies report high levels of negative aspects of care-giving, enabling behaviours, expressed emotion and psychological distress in people who care for those with an ED. Some positive experiences and emotions were also identified.
9	Father-child relationship	Gale et al. (2013)	K = 8 *N* = 2,105 (ED = 323) Including 4 non-clinical, university samples.	R = 12–23	R = 41 — 100% female	AN BN	To present a literary review of the key themes in the literature regarding father-child relationship and its potential contribution to the development and maintenance of either AN or BN in adolescence or young adulthood.	• English language primary research papers published between 2002 and 2012 • Studies that focused on adolescents and young adults with clinical or sub clinical diagnoses of AN or BN • Studies in which there were specific data relating to the father-child relationship • Studies focusing on BED and other ED were excluded	Authors do not report following PRISMA or similar guidelines. However, a quantitative tool by Rees (1994) was used to appraise the methodological quality of studies that met the inclusion criteria. Based on this, studies that were not deemed of a high quality were not included.	The aspects of the father-child relationship that have been studied and found to be of some relevance to the development/maintenance of ED include: (1) communication and conflict resolution style, (2) parental overprotection and psychological control, (3) emotion regulation and self-esteem, and (4) perfectionism. Results are not clear regarding communication and conflict, however, these concepts appear to be relevant. Controlling or intrusive fathering does appear to increase risk for AN or BN. Three studies point to the importance of feelings of shame and being unloved by parents. Three studies suggest that perfectionism may be an important factor related to both quality of fathering and development of ED.
10	Family functioning	Holtom-Viesel & Allan (2014)	K = 17 *N* = 3,562 (ED = 693) 13 studies included control groups All studies used self-report measures,	R = 14.5–24.4	97.8% female	AN BN EDNOS	To systematically review the evidence on family functioning in ED families to answer the following four questions. 1) Are there differences in family functioning between ED families and control families and are these differences in line with any particular models of family functioning? 2) Are there significant differences in family functioning by ED diagnosis? 3) Are there consistent differences in the perceptions of family functioning between family members? 4) Is there any relationship between family functioning and recovery from an eating disorder?	• English language journal article • Studies that use a quantitative methodology, • Studies that focused on family functioning and eating disorders, and addressed one of the review questions. • Studies that did not focus on family functioning as an etiological factor • Studies that included participants with a diagnosis of ED using DSM or ICD criteria, or their family members	Authors report being informed by the NHS CRD (2008) guidelines for data extraction and quality assessment. Authors excluded case studies and commentaries to enhance generalizability of findings. Additionally, 10 of 17 studies included a sample size which limited power, increasing likelihood of type 2 error.	Families with a member with an ED reported worse family functioning than control families, but there was no clear pattern of family dysfunction observed generally or between ED diagnosis. Those with ED reported worse functioning than their family members. Those with more positive perceptions of family functioning generally experienced more positive outcomes.

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11	Childhood sexual abuse (K = 32; *n* = 14,169), Childhood physical abuse (K = 14; *n* = 7,363), Childhood emotional abuse (K = 6; *n* = 2,208)	Caslini et al. (2016) Systematic review and meta-analysis	K = 32 *N* = 14,169 (ED = 1,141) (AN = 453) (BN = 1,381) (BED = 618) (Com = 3,020) 15 clinical samples 17 community samples	R = 14-65	Most samples >90% female (five studies included males)	AN BN BED	To estimate the association between distinct types of child abuse — sexual (CSA), physical (CPA), and emotional (CEA) — and different eating disorders (EDs).	• Peer-reviewed articles without language restriction • Observational studies with a comparative estimation of non-rates of CSA, CPA, and/or CEA between people with and without ED • Excluding studies without an appropriate comparison group, and that did not clearly specify that abuse happened before age 18 years	Authors report followed MOOSE guidelines. To reduce risk of misclassification bias, authors report including only high quality studies, with unequivocal definitions of different types of abuse (sexual, physical, emotional) and standardized methods to assess ED. Authors tested for publication bias and performed trim and fill method to adjust effect size.	A consistent association between childhood abuse and ED was identified (*OR* = 3.21). CSA AN: a positive history in 108 out of 453 individuals with AN. Non-significant association after adjusting for publication bias (*OR* = 1.06). BN: 1682 participants reported a positive history out of 1381 individuals with BN and 7408 without. A significant positive association between BN and CSA (*OR* = 2.73). BED: a positive history in 840 individuals out of 618 with BED and 4552 without. A significant positive association (*OR* = 2.31). CPA AN: a positive history in 21 out of 210 individuals with AN. A significant association (*OR* = 3.31). BN: a positive history in 466 individuals out of 764 with BN and 1536 without. A significant association (*OR* = 2.65). BED: a positive history in 1107 individuals out of 559 with BED and 4250 without. A significant association (*OR* = 3.1). CEA AN: a positive history in 43 out of 111 individuals with AN. Non-significant association (*OR* = 2.13). BN: a positive history in 291 individuals out of 256 with BN and 179 without. A significant association (*OR* = 4.15). BED: a positive history in 487 individuals out of 321 with BED and 1263 without. A significant association (*OR* = 3.7).
12	Interpersonal functioning and family problems	Vall & Wade, (2015) Review and meta-analysis	Qual synthesis K = 147 Meta-analysis K = 126 *N* = 22,853	Adults and adolescents	NR	AN BN OSFED EDNOS	To systematically examine the existing literature across all eating disorders and present a rigorous summary of the evidence for predictors of treatment outcome in individuals with an eating disorder.	• English language peer-reviewed publication from 1984-2014 • Participants with ED diagnosis who have received specialist ED treatment	Authors reported following PRISMA guidelines. Risk of publication bias was addressed by calculating the Fail-safe N for each meta-analysis conducted, to improve robustness of observed relationship.	Better interpersonal functioning at baseline predicated outcome at end of treatment and follow-up, with a small effect. Effect sizes were generally larger for BN and BED than AN. More family problems predicated worse outcomes at end of treatment and follow up, with a small to moderate effect among BN and AN groups, half of whom were adolescents.
13	Interpersonal functioning	Arcelus et al. (2013) Systematic review	K = 35 *N* = 10,104 (ED = 1,735) Of these samples, 24 included those with ED. 18 compared ED and comparison group. 11 included an exclusively non-clinical sample.	*M* = 25.1 R = 18.7–32.8	Mostly female	ED EDNOS AN BN	To systematically evaluate the empirical literature relating to the interpersonal functioning of those with ED psychopathology ad present a preliminary model to help the formulation of clients' difficulties	• English language, peer reviewed articles • Addressing interpersonal difficulties and ED • Articles concerning only body image or dissatisfaction were excluded • Qualitative studies were included • Case studies were excluded • Studies that focused solely on treatment outcome were excluded	Employed Gilbert's (2009) checklist regarding methodological review of cross-sectional studies and the NICE (2004) rating system for methodological quality of studies ranging from good, to reasonable, to poor quality.	From the literature they present a model of interpersonal functioning. The model suggests that maladaptive childhood attachment plats a role in the development of both interpersonal problems and eating disorders. It hypothesises that people with restrictive psychopathology present with fears of negative evaluation and a negative attitude towards the expression of their emotions, which may maintain social anxiety. Those with binge/purge pathology were found to have difficulties trusting others, and possibly related to this, experience high levels of negative interaction and conflicts with others. This may lead to social anxiety, fear of intimacy, and poor emotional support. For all with ED it appears that poor social support helps to maintain ED psychopathology.

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Table 2. (*Continued.*)

Review number	Concepts reviewed related to social mentality theory	Author, year; design; number of studies	Sample	Mean age	Gender	ED diagnoses	Review aims	Eligibility criteria	Quality check	Relevant findings
14	Interpersonal functioning impact on treatment outcome	Jones et al. (2015)	K = 11 *N* = 1,519 (AN = 764) (BN = 707) (EDNOS = 48) No comparison groups	Adult (K = 9) Adolescent (K = 1) Adult and adolescent (K = 1)	Mostly female (91.1-100%)	AN BN EDNOS	To review systematically the eating disorder literature in order to examine the association between pretreatment interpersonal problems and treatment outcome in people diagnosed with an eating disorder.	• English language, peer reviewed, including patients diagnosed with AN, BN, or EDNOS • Studies that include a psychological intervention targeting ED pathology, with pathology measured at both pre- and post-treatment, or treatment completion. • Studies that reported the association between the pretreatment measure of interpersonal problems and treatment outcome. • Single case studies and those focusing on disordered eating in non-clinical populations, obesity, and body dissatisfaction were not included.	Authors did not report following PRISMA or similar guidelines. However, in their discussion they write that 'the research methodology differed in quality, with methodological issues due to small sample sizes or limited external validity observed in some of the studies'.	Eight out of ten studies reported a significant relationship between pretreatment interpersonal problems and treatment outcome (as measured by symptomology or drop out/ completion). Social avoidance appeared to be a detrimental for outcome, particularly in binge-purge ED. Some suggestion that interpersonal difficulties may affect outcomes via impact on the therapeutic relationship, and social network. However, anxious attachment and social anxiety may be associated with better treatment outcome, possibly due to greater need for positive appraisable.
15	Dependent interpersonal style	Bornstein (2001) Meta-analysis	K = 38 Q1: *N* = 3,157 Q2: *N* = 1,040 Q3: *N* = 116	Adults	Female (K = 17) Male and female (K = 3)	AN BN	To use meta-analytic techniques to examine the strength, specificity, and temporal stability of the dependency–eating-disorders relationship. Three questions are addressed: (1) How strong is the association between dependency scores and eating disorder symptoms/diagnoses?; (2) Are observed personality–eating-disorder links specific to dependency or are other traits associated with anorexia and bulimia as well?; and (3) Do dependency levels remain elevated even after eating disorder symptoms diminish, or do dependency levels decrease when symptoms remit?	• Q1: Studies that assess ED symptomology/ diagnosis and interpersonal dependency levels or dependent personality disorder symptoms (K = 20) and studies that assessed these separately for AN and BN groups (K = 9). • Q2: Studies that provide sufficient information to compare base rates of DPD diagnoses and other personality disorder diagnoses in AN and BN groups (K = 19; AN = 6; BN = 13) • Q3: Studies that provide sufficient information to compare DPD base-rates in AN/BN groups pre and post-treatment or compare DPD base rates in match samples of currently ED versus previously ED (K = 3)	This article was published before PRISMA guidelines and likely other review guidelines. However, within each meta-analysis, risk of publication bias was addressed by calculating the fail-safe *N* for each combined *z*. The author uses a wide variety of measures and there may be some question regarding whether the various measures are measuring the same concept or multiple different concepts. In line with this the operational definition of interpersonal dependency is somewhat unclear.	A small positive significant association between interpersonal dependency and eating disorder symptomology was observed. The author defines interpersonal dependency as the tendency to rely on others for nurturance, protection and support. When ED symptoms remit, interpersonal dependency reduces. Overall, dependency scores consistently accounted for approximately 6% of the variance in eating disorder symptoms. Both AN and BN were found to be associated with elevated levels of dependent, avoidant, borderline and histrionic characteristics. Obsessive-compulsive PD occurred more often in AN and schizotypal PD occurred more often in BN.

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16	Romantic relationships	Arcelus, Yates, & Whiteley (2012) Systematic review	K = 20 *N* = 11,632 (ED = 537) 7 sub clinical/ non-clinical samples. K = 4 utilised a comparison group	NR	Female (K = 16) 554 male participants among four studies	AN BN BED ED	To review the available literature in the field of eating disorders and intimate/romantic relationships.	• English language, peer review, quantitative or qualitative studies • Studies that describing other relationships (e.g. mothers or friends) were excluded	The authors do not report following PRISMA or similar guidelines.	Studies involving non-clinical populations have identified an association between subclinical eating disorders (including body dissatisfaction) and relationship and intimacy difficulties. Sexual functioning and satisfaction was found to be low among ED samples. Those with AN, BN or BED were found to experience relationship, intimacy and marital difficulties.
17	Intimate partner violence	Bundock et al. 2013 Systematic review	K = 8 *N* = 11,632 (ED = 538) 5 clinical samples 3 non-clinical large scale epidemiological samples	R = 17.7–44	58% female	ED	To estimate the prevalence and risk of lifetime and past year intimate partner violence (IPV) among males and females with eating disorders.	• Studies that include people who were 13 years or older and were assessed for having an ED using a validated diagnostic instrument or screening tool • Studies that presented peer-reviewed results on experimental, pre/ post, interrupted time series, cohort, case-control, or cross-sectional designs • Studies that measured the prevalence or risk of IPV (physical, sexual or emotional abuse, and/or a range of controlling or coercive behaviours)	Authors reported following MOOSE and PRISMA guidelines and that the protocol was pre-registered with the PROSPERO database. Studies were given a quality appraisal score, using a validate tool to assess study selection and measurement bias.	AN: Lifetime prevalence of physical IPV among women = 18.8%; among men = 25% BN: Lifetime prevalence of physical IPV among women = 22.7–40%; among men = 66.7% Lifetime prevalence of sexual IPV among women = 15.4% BED: Lifetime prevalence of physical IPV among women = 18.8%; among men = 12.5% ED unspecified: Women with probable ED were more likely to reported lifetime physical or emotional IPV (60.4%; *OR* = 5.4). 34.3% of men with a probable ED reported lifetime physical or emotional IPV (non-significant; *OR* = 2.8). A large scale past year prevalence study found that both men (16.4%; *OR* = 4.8) and women (25.1%, 63.6%; *OR* = 9.2, 7.3) with ED were more likely to experience IPV.
18	Self-compassion	Braun et al. (2016)	K = 28 K = 20 used non clinical samples K = 1 combined ED and non-clinical ppts K = 8 used ED samples (ED = 405) Of these, K = 3 used comparison group	Adults	Female (K = 17) NR (K = 11)	ED	To systematically review evidence implicating self-compassion as a protective factor in the context of body image and eating pathology.	• Original peer-reviewed English studies. • Studies that measure self-reported self-compassion and its relationship with at least on variable related to body image or eating pathology. • Theoretical, qualitative and single-participant case studies were excluded.	The authors do not report following PRISMA or similar guidelines and no studies were excluded based on methodological limitations due to the preliminary nature of the topic. However, they note methodological considerations, specifically potential differences in the conceptualisation and measurement of compassion. The authors note that two research groups contributed six and five studies respectively, raising the possibility of researcher allegiance effects.	Findings suggest that self-compassion may serve as a protective factor against eating pathology through decreasing ED-related outcomes directly, preventing the initial occurrence of a risk factor of a maladaptive outcome, interacting with a risk factor to interrupt a deleterious effect, and disrupting the meditational chain through which a risk factor operates.

Note: AN = anorexia nervosa, BED = binge eating disorder, BN = bulimia nervosa, ED = eating disorder, EDNOS = eating disorder not otherwise specified, K = number of studies, MOOSE = Meta-Analysis of Observational Studies in Epidemiology (Stroup et al., 2000), NHS CRD = National Health Service (UK) Centre for Reviews and Dissemination, NR = not reported, *OR* = odds ratio, OSFED = other specified feeding or eating disorder, PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Moher, Liberati, Tetzlaff, Altman, D& The PRISMA Group, 2009).

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Table 3. Measures of Concepts Relevant to Social Mentality Theory Across 18 Included Reviews

Author and year; social mentality concept	Measure of social mentality concept	Information regarding measurement
R1. Caglar Nazali et al. (2014) 1. Attachment and affiliation 2. Understanding mental states 3. Alexithymia 4. Social dominance	1. Self-report: Attachment Styles Questionnaire (K = 4) Parental bonding inventory (K = 25) Attachment History Questionnaire (K = 1) Adult Attachment Style (K = 2) Autobiographical narrative (K = 1) Dimensional Assessment of Personality Pathology Basic questionnaire (K = 2) Social Anhedonia Scale (K = 1) Reciprocal Attachment Questionnaire (K = 1) Inventory of Parent and Peer Attachment (K = 1) Separation Anxiety Symptom Inventory (K = 2) Interview & coding Adult Attachment Interview (K = 1) CaMir Q-sort (K = 1)	1. Most self-report measures of attachment were based on adult romantic relationships and feelings of anxiety or avoidance associated with this. In contrast, the Attachment History and Parental Bonding Inventory asks adults to retrospectively rate their relationship with their parents. The Adult Attachment Interview is a semi structured clinical interview that aims to elicit style of information processing and emotion regulation through accessing attachment memories, focused on early relationships with care-givers.
	2. Reading the Mind in the Eyes Test (K = 9) Empathy Quotient Questionnaire (K = 2) Interpersonal Reactivity Index (K = 3) Francesca Happe's cartoons (K = 3) Internal, Personal and Situational Attributions Questionnaire (K = 2) Interpersonal Perception Task (K = 1) Perspective-Taking Scale (K = 1) Social Cognition and Object Relations Scale (K = 2)	2. Measures included experimental tasks (further described below) and self-report measures that are concerned with understanding others' internal mental experiences, including emotions, perspective, thoughts, and actions.
	3. Toronto Alexithymia Scale (K = 29) Levels of Emotional Awareness (K = 3)	3. Alexithymia refers to difficulties related to perceiving, differentiating, and expressing emotions. These self-report measures ask participants to rate their level of awareness and understanding of their own emotions.
	4. Other as Shamer Scale (K = 2) Submissive Behavior Scale (K = 3) Inventory or Interpersonal Problems (K = 2) Experience of Shame Scale (K = 2) Internal Shame Scale (K = 1) Social Comparison Rating Scale (K = 1) Young Schema Questionnaire (K = 1)	4. Measures were self-report questionnaires that asked participants about experiences of feeling shame or inferiority in a social context.
R2. Bora & Kose (2016) 1. Theory of mind	Reading the Mind in the Eyes Test (RMET; K = 10) Faux Pas (K = 2) Francesca Happe's cartoons (K = 3)	In the RMET, participants are asked to look at a series of photographs of just the eye region of the face and pick which of four words best describe the person in the photo's feelings/thoughts. The Faux Pas measure involved tasks of recognizing faux pas in a series of short stories. The cartoon measure asked participants to attributing mental states to characters in a cartoon story.
R3. Jewell et al. (2016) 1. Mentalisation	Emotion recognition (K = 3) Shape motion recognition (K = 1) Point light walker task (K = 1) Thematic Apperception Test (K = 1) Object Representation Inventory (K = 1)	Emotion recognition tasks were based on images from Matsumoto and Ekman. Videos were experimental paradigms involving videos of moving geometric shapes. Point light walker task involves recognizing biological motion through figures moving made up of lights outlining a human like figure.

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4. DeJong et al. (2013) 1. Social cognition	Reading the Mind in the Eyes Test (K = 2) Levels of Emotional Awareness Scale (LEAS; K = 1) Emotional Stroop (K = 20) Facial Expresses Emotion Labeling (FEEL) task (K = 1) Japanese and Caucasian Facial Expressions of Emotion (JACFEE; K = 1)	The LEAS measures participants' ability to describe their own and others' emotional experiences through the use of vignettes involving interpersonal situations The Emotional Stroop measures response times to facial expressions, neutral expressions and non-facial objects. The FEEL and JACFEE ask participants to label emotional expression from photographs of faces. Other measures are described above.
R5. Tasca & Balfour (2015) 1. Attachment	Self-report: Not reported Interview & coding: Adult Attachment Interview	The AAI is described above.
R6. Zachrisson & Skarderud, (2010) 1. Attachment	Adult Attachment Interview (K = 9)	The AAI is described above.
R7. Tetley et al. (2014) 1. Attachment	Parental Bonding Inventory (PBI) Memories of parental rearing Parental Attitude Scale Young Parenting Inventory-Revised Childhood Experience of Care and Abuse Interview	The PBI was designed to map onto Parker's (1979) construct of parental bonding. It measures dimensions of care ranging from (1) affection, emotional warmth, empathy, and closeness, to emotional coldness, indifference and neglect; and (2) from control, overprotection, intrusion, infantilisation, and prevention of independent behaviour to allowance of independence and autonomy. Other measures were included that mapped onto a similar construct.
R8. Anastasiadou et al. (2014) 1. Care-giving	Camberwell Family Inventory (K = 1) Standardised Clinical Family Interview (K = 1) Five Minute Speech Sample (K = 3) Level of Expressed Emotion (K = 4) Family Questionnaire (K = 9) General Health Questionnaire-12 (K = 7) Hammilton Anxiety and Depression Scale (K = 8) Depression Anxiety Stress Scales (K = 3) State Trait Anxiety Inventory (K = 2) Symptom Checklist-90 (K = 2)	Measures of caregiving experience, accommodation of enabling behaviors, expressed emotion, and psychological distress.
R9. Gale et al. (2013) 1. Father-child relationship	Not reported	
R10. Holtom-Viesel & Allan (2014) 1. Family Functioning	Family Assessment Measure (K = 2) Family Adaption and Cohesion Evaluation Scale (K = 1) The Family Implicit Rules Profile (K = 1) The McMaster Family Assessment Device (K = 5) The Subjective Family Image Test (K = 1) Semi-structured decision making tasks (K = 1) The Leuven Family Questionnaire (K = 1) Family Assessment Device-General Functioning Scale (K = 1) Family Environment Scale (K = 3) Family Dynamics Survey (K = 1) Family Relations Scale (K = 2) Klinston-Loader Family Interview (K = 1) Family Climate Scale (K = 1) Beavers Family Competence and Family Style (K = 1) Observed tasks (discussing a problem and solving a puzzle)	A variety of self-report measures of family functioning and family relationships were used. One family observation task was used.

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Table 3. (*Continued.*)

Author and year; social mentality concept	Measure of social mentality concept	Information regarding measurement
R11. Caslini et al. (2016) 1. Childhood abuse	Presence of childhood sexual abuse (CSA), childhood emotional abuse (CEA), and childhood physical abuse (CPA) established by standardize questionnaire (13), interview (19) and by following an established definition (1)	CSA was defined by the occurrence of at least one of the following scenarios in an individual younger than 18 years: (1) a sexual relationship with physical contact with a family member; (2) unwanted or forced sexual relationships with physical contact with a non-family adult member; and (3) a sexual relationship with a person at least 5 years older. CPA was defined as 'a continuous physical assault by a person older than 18 years which leads to identifiable pain in a subject under the age of 18'. CEA was defined as an act of omission and commission, judged based on community standards and professional expertise to be psychologically damaging. It is committed by parents or significant others who are in a position of differential power that render the child vulnerable, damaging immediately or ultimately the behavioral, cognitive, affective, social, and physiological functioning of the child.
R12. Vall & Wade (2015) 1. Interpersonal functioning 2. Family problems	1. Inventory of Interpersonal Problems (K = 4) Social Adjustment Scale (K = 3) Social Quality of Life Score (K = 1). 2. Paternal substance abuse (K = 1) Maternal critical comments (K = 2) Family environment scale (K = 1) Maternal depression (K = 1) Not having an intact family (K = 1)	Self-report measures regarding social difficulties and family functioning difficulties were used.
R13. Arcelus et al. (2013) 1. Interpersonal functioning	Social Adjustment Scale (K = 6) Social Appearance Anxiety Scale (K = 1) Social Interaction Anxiety Scale (K = 1) Adult Self-Expression Scale (K = 1) College Women Assertiveness Scale (K = 1) Perceived Support Scale (K = 1) Quality of Relationships Inventory (K = 1) Fear of Intimacy Scale (K = 1) Self-Consciousness Scale (K = 1) Sensitivity to Critics Scale (K = 1) Rathus Assertiveness Schedule (K = 1) Hostility and Direction of Hostility Questionnaire (K = 1) Young Loneliness Inventory (K = 1) Observational (K = 1) Significant Others Scale (K = 2) Interpersonal Support Evaluation List (K = 1) Life Events and Difficulties Schedule (K = 1) State Trait Anger Expression Inventory (K = 1) Fear of Negative Evaluation Scale (K = 4) Iowa–Netherlands Comparison Orientation Measure (K = 1) Kikuchi's Social Skill Sale (K = 1) Life Assessment Scale for The Mentally Ill (K = 1) Life Skills Profile (K = 1) Submissive Behavioral Scale (K = 1) Social Comparison Rating Scale (K = 1) Inventory of Interpersonal Problem (K = 5) Attitudes Towards Emotional Expression (K = 1)	A variety of self-report measures that asked participants about their interpersonal functioning and difficulties.

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R14. Jones at al (2015) 1. Interpersonal functioning	A variety of self-report measures that asked participants about their interpersonal functioning and difficulties. Inventory of Interpersonal Problems-64 (K = 5) Inventory of Interpersonal Problems-32 (K = 2) Social Adjustment Scale-Self Report (K = 3) Social phobia (K = 1) World Health Organization: Quality of social relationships (K = 1) Levels of Expressed Emotion (K = 1) Social Phobia Scale (K = 1) Social Interaction Anxiety Scale (K = 1) The avoidant personality index (K = 1) Attachment Styles Questionnaire (K = 1)	A variety of self-report measures that asked participants about their interpersonal functioning and difficulties.
R15. Bornstein (2001) 1. Dependent interpersonal style	Depressive Experiences Questionnaire (K = 1) Rorschach Oral Dependency Scale (K = 2) Personal Style Inventory (K = 2) Sociotropy–Autonomy Scale (K = 2) Adjective Check List (K = 1) Structured Clinical Interview for DSM-III-R Personality Disorders (K = 3) Hand Test (K = 1) Millon Clinical Multiaxial Inventory (K = 2) Interpersonal Dependency Inventory (K = 2) Personality Disorder Examination (K = 1) Family Environment Scale (K = 1) Systems Affective Profile (K = 1) Personality Diagnostic Questionnaire (K = 2) Diagnostic Interview for Personality Disorders (K = 1)	Measures used included structured interview or self-report questionnaires assessing DSM personality disorder symptomology, or self-report questionnaires measuring some form of dependency in relationships.
R16. Arcelus et al. (2012) 1. Romantic relationships	Adult Attachment Style (K = 1) Marital and Body Image Questionnaire (K = 1) Perceived Social Support Questionnaire (K = 1) Interview (K = 3) Fear of Intimacy Scale (K = 1) Experiences in Close Relationships Scale (K = 1) Maudsley Marital Questionnaire (K = 1) Dyadic Adjustment Scale (K = 1) Conflict Inventory (K = 1) Relationship belief inventory (K = 1) Waring Intimacy Questionnaire (K = 1)	Self-report measures and interviews were used to assess relationship satisfaction. A number of studies reported the use of non-validated tools to define dissatisfaction in relationships.
R17. Bundock et al. (2013) 1. Intimate partner violence	Lifetime or past year physical, sexual, emotional violence, or coercive/controlling behavior	
Braun et al. (2016) 1. Self-compassion	Self-compassion scale (K = 4) Self-compassion scale-short form (K = 4) Fears of self-compassion (K = 3)	The Self-Compassion Scale is a 26-item, self-report measure developed by Neff (2003) based on her conceptualisation of self-compassion as being self-kindness, low self-judgment, mindfulness, low over-identification, common humanity, and low isolation. The Self-Compassion Scale — Short form is a shortened version, consisting of 12 items, with a near perfect correlation with the original; however, the subscales show lower reliability.

Note: K = number of studies.

symptomology (R17). Bornstein (2001) defines interpersonal dependency as looking to others for support, nurturance and protection; however, it is not clear whether the included measures meet this definition.

There is some evidence from R16 (which did not include a detailed quality appraisal) that people with ED tend to experience dissatisfaction in their romantic relationships along with poorer sexual functioning and satisfaction. Those with ED have also been found to have a higher past year prevalence and lifetime likelihood of experiencing intimate partner violence, with lifetime prevalence ranging from 12.5–66.7%, and past year prevalence at 16.4% for males and 25.1–63.6% for women (R17).

Social cognition

Evidence suggests that those with ED may demonstrate poorer recognition or understanding of mental or emotional states of others (R1, R2, R3, R4), and of themselves (R1). These results are primarily from asking participants to name emotions in photographs of faces or the eyes specifically, and to identify emotion and socially relevant information in cartoons or scenarios, both in experimental settings. R1 report an overall small effect after adjusting for publication bias. R2 report a large deficit in perspective taking (e.g., recognising a faux pas in a series of short stories or attributing mental states to characters in a short story) and decoding (correctly naming mental states of a person based on a picture of their eyes) among those with acute AN, compared to controls. These participants had greater depressive symptoms, longer illness duration, and lower BMI. Those who were recovered from AN showed a modest impairment in both aspects, while those with BN showed a modest impairment in decoding, but not in perspective taking (R2). R3 also demonstrates an association between metalising difficulties and eating pathology among adolescents, but highlights the likely risk of bias among primary studies. R4 included experimental tasks of perspective taking, recognising emotions and mind states, and processing emotion words. They report inconclusive or no difference among four studies. In one study, those with BN showed greater attentional bias to angry faces, and in another they showed poorer global emotional recognition. However, the primary authors did not state whether scores of lower emotional recognition are for self or other understanding.

Social rank

Caglar-Nazali et al. (2014; R1) reported that those with ED report experiencing greater feelings of social inferiority, submissive behaviour and shame, compared to healthy controls, with a large effect. One primary study also reported increased social comparison among those with ED.

Self-compassion

Braun, Park, and Gorin (2016; R18) identified self-compassion as a consistently relevant construct regarding eating pathology. Primary studies with clinical and non-clinical populations suggest an association between higher self-compassion and lower ED symptomology. Primary studies with community samples also found negative associations between self-compassion and theorised ED risk factors, including body dissatisfaction, social comparison, thin-ideal internalisation, and drive for thinness. A small number of primary studies also reported associations between self-compassion and protective factors such as body image flexibility, body appreciation, and mindful or intuitive eating. Furthermore, one primary study suggested that low self-compassion can have a negative impact on intervention outcome.

Discussion

This article presents a large body of psychological ED research summarised and critiqued in eighteen systematic reviews, through the lens of Gilbert's (1989, 1995, 2005) social mentality theory (SMT). This review highlights the importance of interpersonal difficulties among those with ED. These difficulties are apparent through findings of higher levels of insecure attachment, poorer perceived family functioning, and higher levels of child abuse.

The interpersonal difficulties were reflected in different measurements, including poorer theory of mind and mentalising tasks, trouble expressing emotions and trusting others, heightened conflict, and higher levels of interpersonal partner violence. Interpersonal difficulties were also identified in treatment outcome research, with poorer interpersonal and family functioning associated with poorer outcomes. In terms of intrapersonal relating, those experiencing ED reported greater feelings of shame and inferiority. Conversely, a compassionate self-relationship was negatively associated with ED symptomology.

Though the findings clearly demonstrate the presence of interpersonal difficulties, it is more difficult to clarify their causes. Given the heightened prevalence of insecure attachment and child abuse, it is likely that these experiences contribute to future insecurity and lack of safeness in adult relationships, along with other posttrauma responses such as emotion-regulation difficulties, negative self-view, and submissive, dominant or inhibited social strategies that aim to manage relational fear (Johnstone & Boyle, 2018; Pascuzzo, Moss, & Cyr, 2015).

One explanation that has been offered in the literature to explain the findings of poorer mentalising among those with ED is the suggestion that many who experience ED may also meet a diagnosis of autism spectrum disorder (ASD; Huke, Turk, Saeidi, Kent, & Morgan, 2013). However, in contrast, recent smaller scale research has reported superior mentalisation skills among those with ED (Pedersen, Lunn, Katznelson, & Poulsen, 2012; Pedersen, Pulsen, & Lunn, 2015). Thus, it may be that individuals at both ends of the social cognitive spectrum are more vulnerable to experiencing interpersonal difficulties or to developing an ED. Indeed, greater social sensitivity has been suggested as a relevant dimension for mental health difficulties (Dinsdale, Mokkonen, & Crespi, 2016).

While neurodiversity may be relevant, this does not detract from the importance of recognising the role of early interpersonal trauma and attachment dynamics in later interpersonal difficulties. From a SMT perspective, early attachment or other relational experiences of danger, fear or incongruence likely contribute to lower levels of social safeness and greater levels of perceived threat in future relationships, facilitating competitive mentalities rather than caring mentalities in otherwise caring relationships (Liotti & Gilbert, 2011), thus leading to increased threat, which inhibits mentalising and reduced soothing and safeness that may otherwise facilitate mentalising (Liotti & Gilbert, 2011). Additionally, in heightened experiences of threat, individuals may experience both inhibition or activation of cognition (Kozlowska, Walker, McLean, & Carrive, 2015). Thus, past social threat may shape future templates for social cognition, even if the social threat is no longer present. In this way the interpersonal difficulties identified in this review, such as imbalanced negative or positive social comparison, difficulty trusting others, or greater attentional bias

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towards angry facial expressions, can be conceptualised as learned responses to past social threat or interpersonal trauma.

There are a number of limitations to the measures used within the primary studies. It is possible that higher levels of shame among those with ED that could contribute to a negative response bias in self-report measures is a self-conscious affect that involves perceiving the self in a negative light (Nisbett & Wilson, 1977). The experimental tasks used to measure social cognition, asking individuals to consider pictures and videos of facial expressions, may lack ecological validity (Henry, Cowan, Lee, & Sachdev, 2015). Additionally, they do not consider what state of mind the individual is in when completing the task, which from a SMT perspective could affect social cognition performance (Liotti & Gilbert, 2011).

Implications for Research

Further discussion outlining the theoretical and methodological similarities or differences between the concepts of theory of mind, mentalisation, reflective functioning and social cognition would be useful. Further research could explore whether: (1) social cognition that is dependent on state of mind or social mentality is warranted — for example, whether social cognitive abilities vary according to levels of social threat or social safeness; (2) there is any identifiable pattern in social cognition abilities that may or may not be in line with past social experiences; and (3) social cognition abilities can be trained among individuals to support recovery from an ED. Recent research has found that after specific and repeated mind training (such as meditation, mental imagery exercises, and interpersonal perspective-taking exercises), healthy adults show improvement in social cognitive behavioural outcomes, along with corresponding changes in magnetic resonance imaging of corresponding brain networks (Valk et al., 2017).

An additional area of future research would be to develop measures of social mentalities through assessing motivation, attention, cognition, emotion and physiology in the context of relationships. The development of a comprehensive multimodal assessment may be necessary for this; for example, including self-report questionnaires, third-party reports, social cognition tasks with greater ecological validity, and relatively accessible physiological measures such as heart rate variability, endocrinology, and/or neuro-imaging (e.g., Het et al., 2015; Ranzenhofer et al., 2016; von Hausswolff-Juhlin, Brooks, & Larsson, 2015). A recently developed self-report questionnaire relevant to this is Gilbert et al.'s (2017) Compassionate Engagement and Action Scales for Self and Other, which can help to identify compassionate or caring social mentalities.

Last, the present review highlights areas for future systematic syntheses, including shame, self-criticism, pride, loneliness, selflessness/prosocial behaviour, mentalisation as measured by reflective functioning measures such as the Reflective Functioning Scale (Fonagy, Target, Steele, & Steele, 1998) or the Reflective Functioning Questionnaire (Fonagy et al., 2016), and biological processes considered relevant to SMT.

Implications for Practice

The present findings have important implications for clinical practice. First, within assessment and formulation, clinicians should assess for interpersonal difficulties, their potential role in maintaining the individual's ED, and whether they may be related to attachment style, response to interpersonal trauma, and/or a predisposition towards reduced or heightened social cognition.

Findings point to the importance of the development of a safe therapeutic relationship in which individuals are supported to understand their own and others' experiences (mentalisation), and to be able to communicate emotions and needs. Additionally, it is important to recognise that caring relationships may be complex for many who have an ED, particularly if previous caring relationships have been threatening (Liotti & Gilbert, 2011), therefore amplifying the importance of being attuned to the process of care-seeking and care-receiving that develops within the therapeutic relationship, regardless of therapeutic modality (e.g., McCluskey, 2005).

Findings emphasise the importance of supporting individuals to develop socially safe relationships with people who can support them in recovery. Related to SMT, CFT-E emphasises the importance of social support, and qualitative research has found that participants report a strengthening of relationships outside of those within the therapy group after attending CFT-E (Mullen, Dowling, Doyle, & O'Reilly, 2018). CFT-E also addresses issues of dominant, submissive and inhibited relating styles that may be a part of relational difficulties for clients.

Limitations

This article has offered a demonstration of how SMT may be used to integrate and consider existing ED research; however, it has been limited to psychological literature. It is likely that some systematic reviews regarding the same topic included the same primary articles, and thus must be considered when interpreting these findings. By only including systematic reviews, some relevant topics were left out; however, these are suggested as areas for future syntheses. The review did not search for evidence that is not consistent with SMT, and thus it was not testing the evidence for SMT, but rather applying SMT as an organising framework for existing findings.

Conclusion

The present review highlights research that suggests that individuals with ED often also experience relationship difficulties, emphasising their importance in conceptualisation and intervention. Interpersonal difficulties appear to often be related to past experiences of social threat and trauma, though the relevance of neurodiversity should also be considered. Regardless of aetiology, it is likely that facilitating clients to develop relationships in which they feel safe and connected, where they can seek a balance for issues of power and care, is important in ED recovery.

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