Eating Pathology: Beyond Traditional Psychotherapeutic Approaches

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Declaration

This work has not been submitted for any other degree or to any other institution.

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Abstract

First, a systematic literature review assessed the efficacy of third-wave interventions to treat individuals who have been diagnosed with an eating disorder. Twenty-three studies which cover five forms of intervention were considered - Acceptance and Commitment Therapy, Compassion Focussed Therapy, Dialectical Behaviour Therapy, Mindfulness-Based Interventions, and Schema Therapy. At present, this field of research is in its infancy, as is reflected in the quantity and quality of the studies available for this review. Dialectical Behaviour Therapy appears to be the most robust third-wave intervention in this field. A lack of meaningful comparisons means that further research is required to compare third-wave interventions with other evidenced-based psychological interventions.

Second, the empirical report developed an eating-pathology-specific measure of interpersonal problems, intended to have greater clinical utility for eating pathology than a generic interpersonal problems measure. A large community sample of participants completed online psychometric measures including a novel eating-specific interpersonal problems questionnaire - the Interpersonal Problems in Eating Disorders scale (IR-ED). Participants also completed a generic measure of interpersonal problems and measures of depression, anxiety, social anxiety and eating pathology. The IR-ED has strong psychometric validity. In comparison to the generic measure of interpersonal problems, the final 15-item version of the IR-ED shows similar associations with depression and anxiety and a superior ability to detect and predict eating pathology.

The two components of this thesis expand upon traditional approaches of psychological intervention for people who experience eating pathology by considering the context within which individuals cognitions occur.

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Section 1

Literature Review

A Systematic Review of Third-Wave Psychotherapy Interventions for Individuals Diagnosed with an Eating Disorder

Abstract

Objectives. The aim of this review was to evaluate the effectiveness of third-wave interventions as a potential alternative to traditionally recommended psychological interventions for people diagnosed with an eating disorder, such as cognitive behaviour therapy, cognitive analytic therapy or family based treatment.

Method. A systematic literature search was conducted using the PsycInfo and Web of Science electronic databases in February 2017. Databases were searched using terms focussing on both eating disorders and recognised third-wave psychological interventions. All studies included in this review were subjected to independent quality analysis.

Results. Twenty-three studies were included in this review. Studies incorporated five main types of third wave interventions; Acceptance and Commitment Therapy, Compassion Focussed Therapy, Dialectical Behaviour Therapy, Mindfulness-based interventions and Schema Therapy. Overall, within-group effect sizes suggested large reductions in eating pathology. Mixed and group based interventions yielded greater effect sizes compared to individual-based protocols. Several methodological weaknesses were identified in this field of research, and recommendations are made.

Conclusions. Due to the infancy of the research field, and the methodological weaknesses identified within this review, it is not possible to formally recommend the use of third-wave interventions to treat people diagnosed with an eating disorder. Third-wave interventions do however show promise as an alternative to conventional psychotherapy for people diagnosed with eating disorders, and this initial promise warrants further investigation.

Practitioner Points

Clinical Implications

- Third-wave interventions show early promise in being effective treatments for eating pathology in those diagnosed with an eating disorder.
- At present, Dialectical Behaviour Therapy is the most robust third-wave intervention for the treatment of people diagnosed with an eating disorder.
- While clinicians should implement existing evidence-based models, third-wave interventions could be considered as an alternative when traditionally recommended interventions fail to be effective for an individual.

Limitations

- Only papers published in English were used in this review.
- Effect sizes were not calculated for the impact of third-wave interventions for non-eating-specific psychopathology.

Introduction

Psychological Interventions for the treatment of Eating Disorders

The National Institute of Health and Care Excellence (NICE, 2004) recommends that psychological interventions should play a central role in the treatment of individuals diagnosed with eating disorders such as Anorexia Nervosa, Bulimia Nervosa, Binge Eating Disorder, and Eating Disorder Not Otherwise Specified (EDNOS). Presently the recommended psychological interventions for treating individuals diagnosed with an eating disorder are Cognitive Behavioural Therapy (CBT), Interpersonal Psychotherapy (IPT) and Cognitive Analytic Therapy (CAT). It is possible that these recommendations will change with the new NICE guidelines, due for publication in May 2017.

Despite the recommendations by NICE (2004), research suggests that these forms of psychological intervention are not effective for all people. Byrne, Fursland, Allen and Watson (2011) and Fairburn et al. (2015) both found that approximately one-third of participants who underwent CBT for eating disorders did not meet with full or partial remission at the end of treatment, with Fairburn et al. (2015) also finding that two-thirds of participants did not meet remission following Interpersonal Psychotherapy. A meta-analysis conducted by Shapiro, Berkman, Brownley, Sedway, Lohr and Bulik (2007) suggests that CBT studies for people diagnosed with Bulimia Nervosa experience a typical attrition rate of around 25%. These studies indicate that while CBT and Interpersonal Psychotherapy can be effective treatments for some people who experience eating pathology, they are not universally beneficial. Research is therefore warranted to investigate other potential therapeutic interventions which could supplement the already recommended intervention packages.

Third-Wave Psychotherapies

A group of psychological therapies that have gained attention in the literature are third-wave cognitive behavioural interventions. Hayes (2004) first proposed the term "third-wave" psychological intervention in response to an observation that new forms of psychotherapy were moving their focus away from the frequency and form of cognitions towards focussing on the function of cognitions within the individual's context. The term third-wave psychotherapy now encompasses several different therapeutic models, as detailed in Table 1.

Table 1. Third-wave Psychological interventions (Dimidjian et al., 2016)

Therapeutic Model
Acceptance and Commitment Therapy
Cognitive Behavioural Analysis of Psychotherapy
Compassion Focussed Therapy
Compassionate Mind Training
Dialectical Behaviour Therapy
Functional Analytic Psychotherapy
Metacognitive Therapy
Mindfulness
Mindfulness Based Cognitive Therapy
Mindfulness Based Stress Reduction
Mode Deactivation Therapy
Schema Therapy
Unified Protocol

Are third-wave interventions effective in treating eating pathology?

While third-wave interventions have growing evidence bases in relation to their effectiveness in treating chronic psychopathology such as depression, anxiety or the psychological impacts of specific chronic physical health conditions (Dimidjian et al., 2016), the position is less clear in relation to eating disorders. However, both

Acceptance and Commitment Therapy (ACT; Heffner, Sperry, Eifert, & Detweiler, 2002) and Compassion Focussed Therapy (Goss, & Allan, 2010) have been hypothesised to be effective in the treatment of eating pathology, and both ACT (Manlick, Cochran, & Koon, 2013) and Dialectical Behaviour Therapy (DBT; Lenz, Taylor, Flemming, & Serman, 2014) have been investigated using systematic reviews.

Heffner et al. (2002) suggest that ACT for eating disorders should focus on undermining control and avoidance strategies, allowing the individual to accept unwanted thoughts and feelings while engaging in a more valued life. Goss and Allan (2010) hypothesise that CFT's focus on associated emotional regulation difficulties, shame and self-directed hostility could also prove beneficial to some individuals who experience eating pathology. The focus suggested for either ACT or CFT would be different from that of traditional CBT, and therefore could provide an alternative therapeutic approach to the treatment of eating pathology.

Existing reviews. Given the recent development of many third-wave therapies, the evidence for their effectiveness is not as established as it is for other therapies. Manlick et al. (2013) have reviewed Acceptance and Commitment Therapy's effectiveness in treating eating pathology. They identified a large number of studies focusing on eating pathology, which support the theoretical underpinnings of ACT (e.g., the roles of experiential avoidance, control agendas, and mood intolerance). Unfortunately, they found little clinical evidence for the efficacy of ACT in treating eating disorder populations, other than some promising early results from case studies.

Further evidence for the use of third-wave interventions to treat eating pathology comes from a review conducted by Lenz et al. (2014), who focussed on Dialectical Behaviour Therapy (DBT). Evidence suggested that DBT demonstrated

moderate to large effect sizes when compared to treatment as usual or wait-list controls. However, no active psychotherapeutic condition was used in any of the studies reviewed.

To summarise, theoretical arguments have been made for the use of third-wave interventions for people diagnosed with eating disorders (Goss & Allen, 2010; Heffner et al., 2002). However, in some cases early reviews have failed to support this argument, or have not compared the therapies with active treatments. In short, there has been no review of the comparative effectiveness of the range of third-wave interventions when considering outcomes for eating disorder patients.

Aim and Scope of this Review

This systematic review aims to expand upon prior reviews by Manlick et al. (2013) and Lenz et al. (2014), by evaluating third-wave interventions' effectiveness in the treatment of eating pathology. Where available data exist, the third wave therapies will be compared to active therapies.

Method

Search Strategy

A literature search was conducted using the PsycInfo and Web of Science electronic databases in February 2017. Search terms were based upon combinations of key words that can be found in Table 2. Search terms were divided into two categories based upon the population under study and the therapeutic model used. The Boolean search term of "OR" was used to search within each category, and the term "AND" was used to search between the categories. Articles returned from the initial searches were screened, first by title relevance and then by abstract content. Ancestral searches were

conducted by looking through the reference sections of each study that was included following the abstract sift. The search process is outlined in a PRISMA diagram in Figure 1.

Inclusion Criteria

For inclusion in this review, studies needed to be published in a peer-reviewed journal and written in English. Included studies were required to test the efficacy of a third-wave intervention for use in the treatment of eating pathology. For the purposes of this review, a third-wave psychological intervention is any of the intervention models listed in the Therapeutic model column of Table 2. The only exception to traditional third-wave interventions was motivational interviewing, which was included to ensure that potentially relevant studies were not overlooked. Study samples were required to consist primarily of individuals diagnosed with an eating disorder, and to have a total sample size of greater than five. Eating disorders are classified as any of the following: Anorexia Nervosa, Bulimia Nervosa, Binge Eating Disorder, Binge/Purge behaviours, Eating Disorder Not Otherwise Specified (EDNOS), or Other Specified Feeding or Eating Disorder (OSFED).

Table 2. Search Term Combinations

Population	Therapeutic model
• Eating disorder	• Third wave
• Eating pathology	• 3rd wave
• Anorexia	• Acceptance and commitment therapy
• Bulimia	• Behavioural activation
• EDNOS	• Cognitive behavioural analysis system of psychotherapy
• OSFED	• Dialectical behaviour therapy
	• Metacognitive therapy
	• Meta cognitive therapy
	• Mindfulness based cognitive therapy
	• Schema therapy
	• Functional analytic psychotherapy
	• Integrative couple behaviour therapy
	• Compassion focussed therapy
	• Compassionate mind training
	• Motivational interviewing

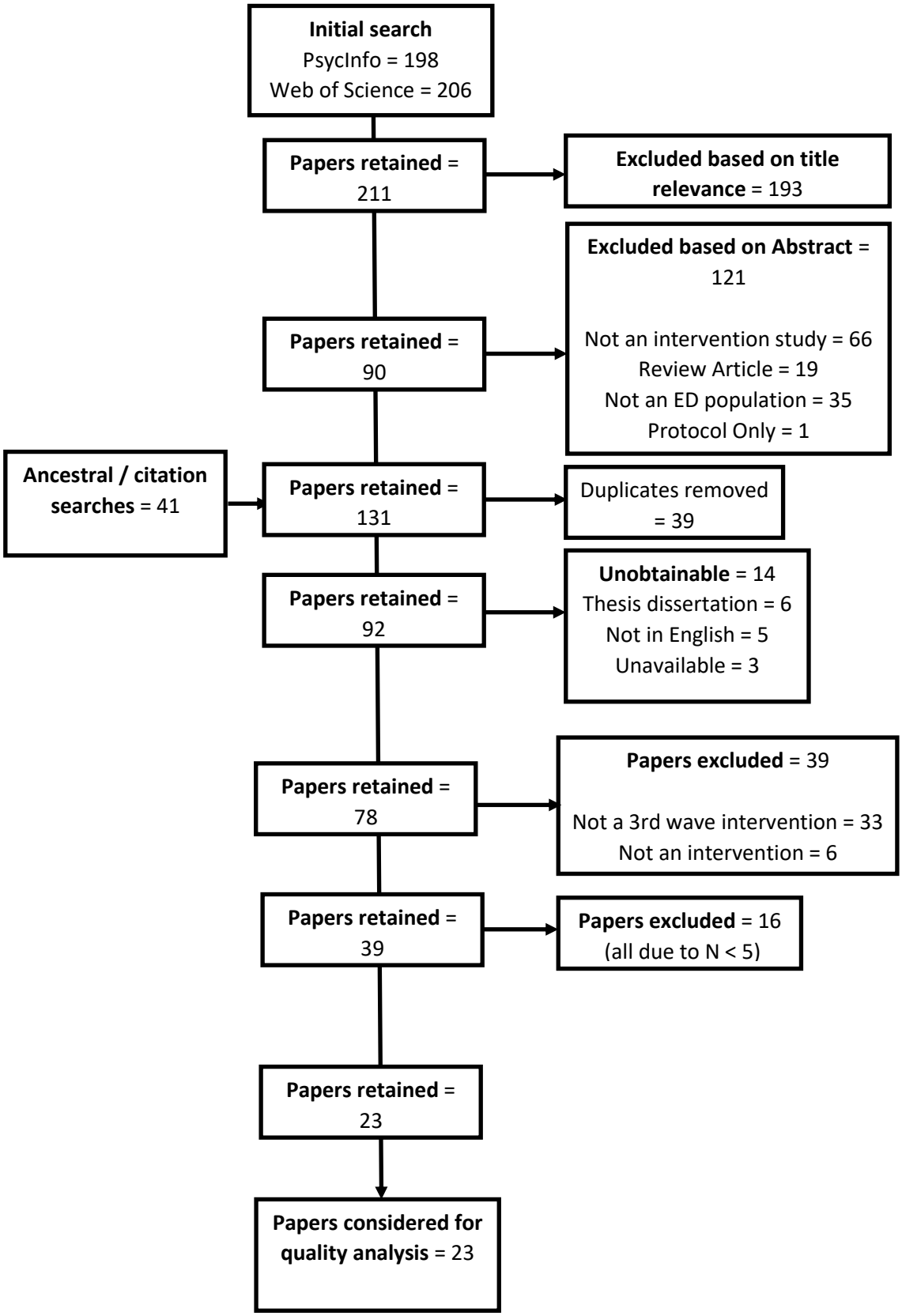

Figure 1. PRISMA search process

Quality Assessment

Twenty-three papers were eligible for the review. One study was omitted from the quality review (Safer, & Joyce, 2011) as it was a supplementary analysis using the same participants as Safer, Robinson and Jo (2010). The inclusion of Safer and Joyce (2011) could therefore have confounded the quality analysis due to including the same data twice. The remaining twenty-two studies were subjected to quality analysis using the Psychotherapy Outcome Study Methodology Assessment Tool (POSMAT; Appendix 1), which was developed specifically for psychotherapy trials, and was first used in Ost's (2008) systematic review of third-wave therapies. Following training in how to use the POSMAT, the raters in Ost's (2008) review demonstrated an inter-rater reliability rating of 75%. A maximum score for this quality assessment tool is 44.

Studies included in this review were independently evaluated by two Trainee Clinical Psychologists. Of the twenty-two studies included in the quality analysis the initial inter-rater agreement was 63.56%. All disagreements were discussed and resolved prior to continuing the review.

The mean quality of the papers included in this review was 21.73 (standard deviation = 7.09). This figure is similar to the findings from Ost (2008), who reviewed 32 third-wave therapy trials and found a mean quality rating of 19.6 (standard deviation = 4.9).

Several studies scored zero or "poor" on POSMAT items. A breakdown of what proportion of third-wave interventions scored "poor" on each POSMAT item can be found in Table 3, alongside an overall quality rating. Overall, studies describe and use appropriate outcome measures and describe their planned intervention well. Conversely, studies tended to not use blind assessors during screening and often did not

report an *a priori* power analysis. Many of the studies included in this review were service-based research and were not set up as randomised controlled trials, which may have limited the possibilities of imposing strict methodological procedures from the outset.

Scores on the quality assessment measure indicate that the field of third-wave psychological therapies in eating disorders has several methodological weaknesses. These weaknesses need to be carefully considered and addressed as the field progresses. Only five of the studies included in this review utilised an active treatment comparison, with most studies either being a single pre-post cohort study or a comparison of treatment against a wait-list control. Item 22 on the POSMAT (which is specific to non-waitlist control comparison designs) is therefore largely non-applicable to this sample. This pattern highlights the lack of studies comparing a third-wave psychotherapy intervention against another active treatment, such as CBT.

Table 3. Percentage of studies which scored a "0" or "poor" rating on the psychotherapy outcome study methodology assessment tool (POSMAT)

	Overall n =22	ACT n = 5	CFT n = 1	DBT n = 10	Mindfulness n = 3	Schema n = 3
1. Clarity of sample description	0%	0%	0%	0%	0%	0%
2. Severity / Chronicity of disorder	27.27%	20%	0%	20%	100%	0%
3. Representativeness of sample	0%	0%	0%	0%	0%	0%
4. Reliability of diagnosis in question	18.18%	0%	100%	10%	66.67%	0%
5. Specificity of outcome measure	4.55%	0%	0%	10%	0%	0%
6. Reliability and validity of outcome measures	9.09%	0%	0%	20%	0%	0%
7. Use of blind evaluators	72.73%	80%	100%	60%	100%	66.67%
8. Assessor training	54.55%	60%	100%	30%	66.67%	100%
9. Assignment to treatment	54.55%	40%	100%	50%	66.67%	66.67%
10. Design	68.13%	40%	100%	80%	66.67%	66.67%
11. Power Analysis	86.36%	80%	100%	100%	66.67%	66.67%
12. Assessment points	40.91%	60%	100%	30%	33.33%	33.33%
13. Manualized, replicable, specific treatment programs	0%	0%	0%	0%	0%	0%
14. Number of therapists	13.64%	0%	100%	10%	33.33%	0%
15. Therapist training and experience	13.64%	0%	0%	20%	33.33%	0%
16. Checks for treatment adherence	45.45%	20%	100%	50%	66.67%	33.33%
17. Checks for therapist competence	45.45%	20%	100%	50%	66.67%	33.33%
18. Control of concomitant treatments	59.09%	60%	100%	50%	66.67%	66.67%
19. Handling of attrition	31.82%	20%	1005	30%	66.67%	0%
20. Statistical analysis and presentation of results	9.09%	20%	0%	10%	0%	0%
21. Clinical significance	36.36%	40%	0%	30%	66.67%	33.33%
22. Equality of Therapy hours (non-WLC designs only)	72.27%	60%	100%	80%	100%	66.67%
Mean Quality Score	21.73	22.6	14	23	15	25.33

Note: ACT, Acceptance and Commitment Therapy; CFT, Compassion Focussed Therapy; DBT, Dialectical Behaviour Therapy; WLC, Wait-list control.

Results

A total of one-thousand and thirty participants were included in the studies, with six-hundred and twenty-four participants undergoing a third-wave intervention to treat eating pathology. The sample was overwhelmingly female (94.27%). The overall study attrition rate, which was calculated from when participants were assigned to interventions or wait-list controls, was 24.85%, compared to an attrition rate of 20.19% for participants who were only assigned to third-wave interventions.

Effect sizes of reviewed studies

To assess the effectiveness of third-wave interventions for the treatment of eating pathology effect sizes were, where possible, calculated for the papers included in this review (Table 4). Effect sizes were calculated based upon the primary outcome for eating pathology in each study, as assessed by instruments such as the Eating Disorder Examination (EDE; Cooper & Fairburn 1987) or Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994). Eating-pathology specific effect sizes were calculable for seventeen papers, of which thirteen offered within-group effect sizes for a third-wave intervention over time. A fourteenth paper (McIntosh et al., 2016) looked at a within-group effect size. However, this was a pooled intervention effect size, which combined Mindfulness, CBT and CBT-A over time. Therefore, the true effect of mindfulness per se is not reported, and the paper was excluded from the effect size analysis.

Table 4. Individual summaries of the studies included in this review

Therapy	Author	Diagnosis	N	Study Quality	Primary Outcome Measures	Key Results	Eating Pathology Effect Size (*d*)
Acceptance and Commitment Therapy	Hartmann, Thomas, Greenberg, Rosenfield, & Wilhelm. (2015)	AN, BDD	Distraction = 20 Acceptance mindfulness = 21 Cognitive restructuring = 22	21	Brown Assessment of Beliefs Scale, EDE, SCID, Yale Brown Obsessive Compulsive Scale Modified for Body Dysmorphic Disorder, Body Image Disturbance Questionnaire, BDI, PANAS	AN, BDD and Controls all showed reduction in appearance related thoughts irrespective of intervention (acceptance, cognitive restructuring or distraction). BDD group benefitted from acceptance condition with regards to positive affect, the opposite was found for controls. AN showed greater acceptance during cognitive restructuring whereas this was not true for BDD. Controls showed most acceptance when using distraction.	N/C
	Juarascio et al. (2013)	AN, BN	ACT = 66 TAU = 74	23	EDE-Q, SCID, Drexel Food Scale, Acceptance and Action Questionnaire, Difficulties in Emotional Regulation, Food Challenge Task, Brief Symptom Questionnaire, Rehospitalisation, Height, Weight, Treatment Acceptability Questionnaire	Most variables measured showed a trend towards greater improvement in the ACT group but this was mostly non-significant. Thirty-eight percent of participants in the ACT group moved from clinically significant EDE-Q scores to non-clinically significant, only 17% of the Treatment as Usual (TAU) group did the same. Attendance at the ACT group was strongly associated with reductions on the EDE-Q. The lack of significant difference between the groups may be due to the relatively good outcomes of the TAU group.	ACT (WG) = 0.65 (data unavailable for TAU)
	Merwin, Zucker, & Timko. (2013)	AN	6	17	Credibility and Expectancy Questionnaire, EDE, EDE-Q, Behaviour Assessment System for Children-2 Adolescent Version, Youth Quality of Life-Revised, ABOS, Avoidance and Fusion Questionnaire, Experience of Caregiving Inventory, Quality of Life Inventory, AAQ	Five out of six participants showed increased BMI post intervention and four out of six showed an overall decrease on the EDE-Q, although subscale scores varied. Half showed a reduction in anxiety, while four out of six showed reductions in depression.	ACT (WG) = 0.98

	Parling, Cernvall, Holmgren, & Ghaderi. (2016)	AN	ACT = 24 TAU = 19	31	SCID, EDE, EDE-Q, Montgomery Asberg Depression Rating Scale, Quality of Life Inventory, Percieved Social Support, SCL-90-R, RSES, Body Shape Questionnaire, Ways of Coping Questionnaire, Eating Disorder Inventory-2, BMI	No overall significant difference found between TAU group and ACT group. ACT group showed less drop-out over course of intervention and had less hospital admissions or visits to psychiatrist in 12 months post-intervention. BMI and EDE-Q scores both showed significant improvements over time in both groups.	ACT (WG) = 1.02 TAU (WG) = 0.98
	Timko, Zucker, Herbert, Rodriguez, & Merwin. (2015)	AN	47 families	21	EDE, Body Mass Index, ABOS, Remission Status, Family Questionnaire, Difficulties in Emotional Regulation Scale, AAQ-Youth, AAQ	Significant improvements on EDE-Q subscales. Forty-eight percent of adolescents met criteria for full remission post-treatment and 30% met partial remission. Significant improvements were observed for parental acceptance and experiential avoidance, whereas for adolescents, only experiential avoidance improved.	ACT (WG) = 0.78
Compassion Focussed Therapy	Gale, Gilbert, Read, & Goss. (2014)	AN, BN, EDNOS	139	14	EDE-Q, Stirling Eating Disorders Scale, Clinical Outcomes in Routine Evaluation – Outcome Measure	Found significant improvements in all measures studied. Appeared to have a greater impact upon BN participants than other diagnoses groups. At the end of intervention 71% of BN considered to have recovered compared to 30% EDNOS and 21% of AN.	CFT (WG) = 0.47
Dialectical Behaviour Therapy	Ben-Porath, Wisniewski, & Warren (2009)	AN, BN, EDNOS + BPD	ED = 24 ED + BPD = 16		EDE-Q, NMRS, BDI-II, BAI-II, Personality Disorder Questionnaire-4	Both those diagnosed with and without BPD showed significant reductions on EDE-Q, BDI-II and BAI-II scores; however, no group effects were observed. Participants diagnosed with BPD + ED scored significantly lower on measures of negative mood compared to those diagnosed only with ED. The differences in the presence of negative mood were not significant post-intervention.	N/C
	Chen, Matthews, Allen, Kuo, & Linehan. (2008)	BED, BN	8	21	EDE, Suicide Attempt and Self-Injury Inventory, Social History Interview, Longitudinal Interval Follow-up Evaluation	Pre-post DBT effect sizes were large for objective binge episodes and EDE scores. Self injury, suicidal behaviour and additional axis-1 symptoms showed medium effect sizes. All measures showed large effect sizes when looking at pre-DBT scores compared to 6-month follow-up.	DBT (WG) = 1.66
	Courbasson, Nishikawa, & Dixon. (2012)	AN, BN, BED + Substance Misuse	25		Addiction Severity Index, Drug-Taking Confidence Questionnaire-8, EDE, EDI, EES, NMRS.	Significant improvements on EDE scores, BDI and NMRS subscales were observed as well as reduced substance misuse.	DBT (WG) = 1.8

	Hill, Craighead, & Safer. (2011)	BP	DBT = 18 Wait-list = 14	26	SCID Examination, EDE-Self Report, MACSQ-R, Interoceptive Awareness Scale-Expanded, Preoccupation with Weight and Shape Scale, Height, Weight, EES, NMRS, PANAS, BDI	Participants in the treatment condition demonstrated significant reductions in objective binge episodes, vomiting episodes, EDE-Q scores, MACSQ-R, Preoccupation with food, eating shape and weight. Significant improvements were also found in positive affect and interoceptive awareness. 61.5% of the sample no longer met full diagnostic criteria for BN post-treatment.	DBT vs WLC (BG) = 0.77
	Kroger et al. (2010)	AN, BN	AN + BPD = 9 BN + BDD = 15		EDI-2, Global Severity Index, Global Assessment of Functioning, BMI, Binge Eating Episodes	Significant reduction in number of Axis 1 comorbidities at 15-month follow-up for both AN and BN participants. Moderate to large effect sizes were seen for all other measures maintained at follow-up with the exception of BN+BPD participants who showed a small effect size with respect to BMI and Global Severity index change.	DBT for AN + BPD (WG) = 0.99 DBT for BN + BPD (WG) = 0.76
	Palmer, Birchall, Damani, Gatward, McGrain, & Parker (2003)	BN / BED / EDNOS	7	14	Number of hospital days, Episodes of Notable Self-Harm	Levels of self-harm and hospital days reduced for six out of seven participants. Three of seven participants were no longer classified as having an ED diagnosis at follow-up, a further three participants diagnoses moved from BN to EDNOS with the 7th participant starting and finishing the program with an EDNOS diagnosis.	N/C
	Safer, & Joyce. (2011)	BED	DBT = 50 Active comparison Group = 51		EDE, TFEQ, BDI, Questionnaire on Eating and Weight Patterns, Objective Binge Episodes, BMI	Drop-out rate was three times higher for participants who did not rapidly respond to treatment from DBT or the control condition. Significantly higher binge eating abstinence from rapid responders to DBT compared to non-rapid responders.	N/C
	Safer, Robinson, & Jo. (2010)	BED	DBT = 50 Active comparison Group = 51		EDE, BDI, RSE, NMRS, EES, PANAS, Difficulties in Emotion Regulation Scale, BMI, Binge Eating Episodes	DBT group showed significantly greater binge eating abstinence compared to controls post-treatment; however, this effect did not persist at follow-up due to an increase in abstinence in the control group. Small to moderate effect sizes for eating pathology were seen favouring the DBT condition.	DBT vs Active Comparison Group Therapy (BG) = 0.46
	Safer, Telch, & Agras (2001)	BN	DBT = 16 Waitlist = 15	20	Number of binge / purge episodes, NMRS, BDI, EES, Multidimensional Personality Scale, PANAS, RSES	DBT group showed significant reductions in binge/purge behaviour compared to wait-list controls. No other significant differences were found; however, this may be due to bonferonni correction which led the p value to be set at 0.0045	N/C
	Telch, Agras, & Linehan. (2000)	BED	11		EDE, weight, BES, EES, RSE, BDI, PANAS, NMRS	Eighty-two percent of participants were abstinent from binge eating post intervention. Large effect sizes were seen for EDE subscales of weight, shape and eating concern as well as depression.	DBT (WG) = 1

	Telch, Agras, & Linehan. (2001)	BED	DBT = 22 Wait-list = 22	24	EDE, Binge Eating Scale, EES, RSES, BDI, PANAS, NMRS, Height and Weight	DBT group showed significant reductions in binge eating behaviours, EDE scores and anger. No other outcome measures showed significant differences post-intervention.	DBT vs Waitlist control (BG) = 0.77
Mindfulness	Baer, Fischer, & Huss. (200**6**)	BED	10	10	EDE, BES, Eating Expectancy Inventory, Kentucky Inventory of Mindfulness Skills, BDI	Moderate to large treatment effect sizes in most measures studied. Scores on the EDE were mixed with restraint, eating and shape concern improving and weight concern worsening. Attention to, and acceptance of internal experiences also showed significant improvement over time.	Mindfulness (WG) = 0.86
	Kristeller & Hallett (1999)	BED	21	9	Binge Eating Scale, BDI, BAI, No of Binge Episodes	Number of binge episodes reduced significantly. Eating control, mindfulness, hunger awareness and satiety awareness all showed improvement. Scores on binge eating scale, depression and anxiety all significantly improved.	Mindfulness (WG) = 2.7
	Kristeller, Wolever, & Sheets. (2014)	BED	Mindfulness = 53 Cognitive Based Psycho-ed = 50 Waitlist = 47	26	BES, Three-Factor Eating Questionnaire, Power of Food Scale, Eating Self-Efficacy Scale, BDI, RSES, BMI, Homework Records	All variables with the exception of BMI showed significant improvements in mindfulness and psychoeducation interventions compared to controls. Similar outcomes observed post-intervention; however, at 4-months post the mindfulness intervention 68% no longer met BED status compared to 46% in the psychoeducation arm and 36% of wait list controls.	Mindfulness (WG) = 1.64 Cognitive Based Psycho-ed (WG) = 1.69 Wait-list controls (WG) = 0.46
Schema Therapy	George, Thornton, Touyz, Waller, & Beaumont (2004)	AN / EDNOS	8	16	Anorexia Nervosa Stages of Change Questionnaire, Extended Satisfaction with Life Scale, Eating Attitudes Test, GHQ, YSQ, BMI, binge/ purge episodes.	No changes were found in eating pathology or health. Motivation for change did significantly improve and participants were able to identify salient schemas.	N/C

	McIntosh et al. (2016)	BED	CBT = 38 CBT-A = 36 Schema Therapy = 38	37	Frequency of Objective Binge Episodes, Binge Episode Abstinence, Eating Disorder Inventory-2, SCL-90-R	No significant differences were found between CBT, appetite focussed CBT or schema therapy. Significant improvements in binge eating and psychopathology for all treatment conditions. Suggests that Schema therapy and appetite-focussed CBT had similar effects to traditional CBT.	Schema + CBT + CBT-A (WG) = 1.29 (effect size based on pooled change across all interventions – no significant differences found between them)
	Simpson, Morrow, van Vreeswij, & Reid (2010)	BP	8	23	EDE-Q, CORE-OM, SCl-90-R, RSES, Schema Mode Inventory, Working Alliance Inventory	EDE-Q scores fell from clinically severe levels to below clinical cut-offs post treatment and this effect was maintained at one-month follow-up. Vomiting and purging episodes fell over the course of therapy as did psychological distress as measured by the CORE-OM. All 12 schema-focussed outcomes were within 1 standard deviation of the normal range post-treatment compared to only 6/12 pre-treatment.	Schema (WG) = 0.75

Note: AN = Anorexia Nervosa, BDD = Body Dysmorphia Disorder, BN = Bulimia Nervosa, BPD = Borderline Personality Disorder, EDNOS = Eating Disorder Not Otherwise Specified, BED = Binge Eating Disorder, BP = Binge Purge Disorder, ACT = Acceptance and Commitment Therapy, DBT = Dialetical Behaviour Therapy, MBCT = Mindfulness Based Cognitive Therapy, BMI = Body Mass Index, EDE = Eating Disorder Examination, BDI = Beck Depression Inventory-II, PANAS = Positive and Negative Affect Schedule, SCID = Structured Clinical Assessment for DSM-IV, EES = Emotional Eating Scale, NMRS = Negative Mood Regulation Scale, BAI = Beck Anxiety Inventory, BES = Binge Eating Scale, RSES = Rosenberg Self-Esteem Scale, SCL-90-R = Symptoms Checlist-90-Revised, EDE-Q = Eating Disorder Examination-Questionnaire, AAQ = Acceptance and Action Questionaire, BI-AAQ = Body Image – Acceptance and Action Questionnaire, YSQ = Young Schema Questionnaire, CIA 3.0 = Clinical Impairment Assessment 3.0, N/C = Not calculable, WG = Within Group Comparison, BG = Between Group Comparison.

Using Pearson's correlations, there were no significant relationships between quality score and within-group effect size (r = -0.13, p = 0.671) or between sample size and within-group effect size (r = -0.296, p = 0.326). Independent samples t-tests were used to compare the effect sizes of the lowest quality rated studies and the highest (divided by median split), and to compare the effect sizes of the studies with larger and smaller sample sizes (median split). The cut-off points for the high and low grouping variable were 23 for quality rating and 24 for sample size. No significant differences were observed between the effect sizes of the highest and lowest rated studies for either quality (t(11) = -0.382, p = 0.71) or sample size (t(11) = -0.837, p = 0.42). Therefore, neither quality or sample size impacted on the observed eating pathology effect sizes.

Summary of Findings

The following summaries are a synthesis of the data presented in Table 4. For an overview of each individual study included in this review, please refer to Table 4.

Dialectical Behaviour Therapy (DBT): DBT is the most studied third-wave intervention for use in people diagnosed with an eating disorder. Little of this evidence is in comparison to other forms of psychotherapy, meaning that it is impossible to make direct comparisons. However, the early evidence is encouraging. See Table 4 for an outline of each of the included studies.

Individual DBT has been tested by one study (Hill, Craighead, & Safer, 2011), which used 12 weekly sessions of DBT for people experiencing Binge-Purge disorder. Compared to wait-list controls, individual DBT demonstrated effectiveness in relation to general eating pathology and more specifically to binge/purge behaviours (*d* = 0.77). Due to the small sample size (N = 32) and this being the only trial of individual DBT

sessions, it is difficult to generalise these findings beyond the early promise offered by this trial.

Six studies have evaluated group-based DBT. Four have focussed on people diagnosed with Binge-eating disorder (Safer, & Joyce, 2011; Safer, Robinson, & Jo, 2010; Telch, Agras, & Linehan, 2000; Telch, Agras, & Linehan, 2001). All four studies have found significant improvements in terms of binge eating abstinence or binge eating behaviour either pre-post intervention (Telch et al., 2001; *d* = 1.00), compared to waitlist controls (Telch et al., 2000; *d* = 0.77), or compared to an Active comparison group (Safer, et al., 2010; *d* = 0.46). Safer and Joyce (2011) expanded on the benefits of DBT by suggesting that a sub-group of participants who derive an early benefit from the protocol show significantly greater outcomes compared to those who do not. Two further studies have focused on group-based DBT for people diagnosed with either bulimia nervosa (Safer, Telch, & Agras, 2001) or a mixed eating disorder diagnosis group with or without borderline personality disorder (Ben-Porath, Wisniewski, & Warren, 2009). Both studies showed significant reductions in eating pathology following group-based DBT. However, effect sizes were not calculable based on the data provided in the papers, making it difficult to summarise their overall effect. Group-based DBT demonstrated less consistent outcomes for other behaviours or for mood compared to the generally consistent outcome observed for eating pathology.

Four studies have focused on DBT interventions that incorporate both individual and group sessions for mixed eating disorder samples. Three of these studies (Chen, Matthews, Allen, Kuo, & Linehan, 2008; Courbasson, Nishikawa, & Dixon, 2012; Kroger, et al., 2010) have demonstrated significant improvements in both eating and non-eating psychopathology (DBT: *d* = 1.66-1.8, DBT vs Waitlist control: *d* = 0.77*)*. The remaining

study (Palmer, Birchall, Damani, Gatward, McGrain, & Parker, 2003) did not measure psychopathology specifically, but did show a significantly reduced number of hospital stays following DBT.

To summarise, DBT has been associated with positive outcomes for eating pathology, especially in respect to Binge Eating Disorder. Mixed and group DBT formats currently have the greater pool of evidence, with mixed interventions yielding higher effect sizes compared to group or individual protocols. The evidence for DBT's effectiveness in non-eating pathology is less consistent and requires further investigation.

Acceptance and Commitment Therapy (ACT): Five studies, which are outlined in Table 4, have investigated the effectiveness of ACT for use in people diagnosed with an eating disorder. Both Merwin, Zucker and Timko (2013) and Timko, Zucker, Herbert, Rodriguez and Merwin (2015) investigated Acceptance-based Separated Family Treatment (ASFT) for adolescents aged between 12 and 18 years old. Both studies found similar reductions of eating pathology over time (*d* = 0.78-0.98). Both of these interventions also demonstrated benefits for parents in terms of reduced anxiety and caregiver burden (Merwin et al., 2013), and acceptance and experiential avoidance (Timko et al., 2015).

Individual-based ACT was employed by Parling, Cernvall, Holmgren and Ghaderi (2016) with a sample of participants diagnosed with Anorexia Nervosa. Significant improvements in eating pathology were found in the ACT group (d = 1.02). However, this effect was not significantly different from improvements found in an intensive TAU package (*d* = 0.98). With respect to comparing ACT to a TAU condition, Jurascio et al. (2013) found significant improvements over time on eating pathology when employing

a group-based ACT protocol (*d* = 0.65). However, like the Parling et al. (2016) study, differences in eating pathology were not significantly different when compared to an intensive TAU. Another individual protocol was employed by Hartmann, Thomas, Greenberg, Rosenfield and Wilhelm (2015). Within this paper, participants with Anorexia Nervosa or Body Dysmorphic Disorder were invited to take part in a small 5-minute exercise focussing on distraction, acceptance or cognitive restructuring techniques. Differences emerged from this study suggesting that individuals diagnosed with Body Dysmorphic Disorder benefitted more from the acceptance condition whereas the Anorexia Nervosa group benefitted more from the cognitive restructuring exercise.

In summary, studies focusing on the use of ACT have demonstrated significant improvements in eating pathology over time. However, in some studies improvements in eating pathology are not over and above the improvements seen in established TAU programs. ASFT has shown an ability to improve not only eating pathology, but also parental psychological health. Further research is required to compare ASFT against evidence based family interventions.

Mindfulness: Interventions that focus on mindfulness as the primary component have been evaluated in three studies. All of these studies have used group-based protocols focussing on Binge Eating Disorder. Each of the studies included in this section is outlined in Table 4. Interventions which focus on mindfulness have varied in how they are delivered with Baer, Fischer and Huss (2006) using Mindfulness-Based Cognitive Therapy, Kristeller and Hallett (1999) using Mindfulness meditations and mindful eating, and Kristeller, Wolever and Sheets (2014) using Mindfulness-Based Eating Awareness Training. All studies have found significant reductions in binge-eating behaviour and

eating pathology (*d* = 0.86-1.64). Effects of mindfulness in Kristeller, Wolever and Sheets' (2014) study were similar to those of a cognitive-based psychoeducation program (*d* = 1.69), which also found significant reductions in eating pathology. It is worth noting that all effect sizes were higher than those found in a wait-list control group *(d* = 0.46).

To summarise, results from studies investigating the effectiveness of mindfulness for people who experience eating pathology have shown a reduction in eating pathology. However, due to the study populations used, these findings can only be applied to participants who experience Binge-Eating Disorder. The interventions which have focussed on mindfulness contain substantial heterogeneity with respect to their protocols. The effectiveness of mindfulness as an individual intervention technique is therefore difficult to ascertain due to variations in treatment delivery. Mindfulness has shown similar effectiveness to Cognitive-Based Psychoeducation programs and is superior to wait-list controls.

Schema therapy: Three studies (outlined in Table 4) have focussed on the efficacy of Schema Therapy for people diagnosed with Eating Disorders. Each of the studies focussing on Schema Therapy have utilised different diagnostic groups within their samples: Anorexia Nervosa and EDNOS (George, Thornton, Touyz, Waller, & Beaumont, 2004), Binge-Eating Disorder (McIntosh, Jordan, Carter, Frampton, McKenzie, Latner, & Joyce, 2016) and Binge/Purge disorder (Simpson, Morrow, van Vreeswij, & Reid, 2010). The two studies focussing on group-based schema therapy (George et al., 2004, Simpson et al., 2010) have found conflicting results, with one finding no changes (effect size not calculable) in eating pathology and one finding much more positive results indicating improvements in eating pathology (*d* = 0.75). It is

possible that George et al.'s (2004) lack of eating pathology improvement can be attributed to the decision to purposefully select a difficult-to-treat sub-population of people diagnosed with long-term eating disorders. Despite a lack of improvement in eating pathology, George et al. (2004) did find significant improvements in motivation to change following intervention. Further long-term follow-up of this sample would have helped to evaluate if this initial shift in motivation led to long term improvements in eating pathology.

A further trial focussing on individual schema therapy (McIntosh et al., 2016) found significant improvement over time in terms of eating pathology, but that change was not significantly different from standard CBT or appetite-focussed CBT. The overall effect size for the three types of intervention over time was *d* = 1.29. A separate effect size for each of the three therapies was not presented.

To summarise, the overall results from trials of schema therapy are mixed. Both group and individual interventions have demonstrated improvements in eating pathology over time, with an individual intervention being comparable to CBT. While Schema therapy does not appear as effective for individuals with long-term Anorexia Nervosa for treating eating pathology, improvements in motivation to change may help facilitate change in the long term. However, this hypothesis would need to be confirmed via future research.

Compassion Focussed Therapy (CFT): Only one study, which is detailed in Table 4, has investigated CFT for use in people diagnosed with an eating disorder. Gale, Gilbert, Read and Goss (2014) used a mixed sample of participants diagnosed with Anorexia Nervosa, Bulimia Nervosa and EDNOS, and found moderate improvements for eating pathology (*d* = 0.47) and all other measures studied. Different recovery rates were found

between the three diagnostic categories, suggesting that CFT may be more beneficial for Bulimia Nervosa (71% recovered) than for EDNOS (30% recovered) or Anorexia Nervosa (21% recovered).

Discussion

Synthesis of Findings

Overall, third-wave interventions show promise as therapeutic approaches for people who have been diagnosed with an Eating Disorder. At present, the variant of third-wave intervention with the most robust evidence base is DBT. Other variants of third-wave interventions such as Mindfulness-based interventions, ACT and Schema Therapy show promise for treating eating pathology. However, the pool of evidence to support them is relatively shallow. CFT has shown small effects over time for people with Anorexia Nervosa and EDNOS and high recovery rates for people diagnosed with Bulimia Nervosa. However, findings were only from one study, limiting their generalisability.

Research Limitations

A comprehensive literature search yielded only twenty-three acceptable studies that focussed on third-wave interventions for people diagnosed with an eating disorder, suggesting that this field is still in its infancy. Much of the published research is case studies or case series. While case studies and case series are useful as proof-of-concept, they are not generalizable to a wider population in isolation and therefore were not included in this review. Several studies were also excluded from this review as they did not sufficiently include diagnostic criteria, indicating more extensive weaknesses in the literature to date.

The majority of research conducted in this field is limited to pre-post single cohort designs. When a comparison group is utilised, it is often a waiting list or TAU group. The true effectiveness of the interventions in comparison to other evidence-based interventions is therefore difficult to evaluate.

Quality levels were weak in similar ways across many studies. They often did not report *a priori* power calculations, meaning that some studies that found non-significant results were likely to be underpowered due to small sample sizes. In future, planning sample sizes prior to beginning an investigation will be necessary to gain greater certainty of whether a null hypothesis should or should not be accepted.

Many of the studies do not report how intervention fidelity was maintained and measured. While this failure does not necessarily mean that the treatment deviated from what was expected, it does lead to concerns about whether the outcomes truly represent the effectiveness of the intervention in question. Participants who undergo eating disorder treatment might experience changes in their medication or re-feeding regimes, and many studies did not control for these changes. Therefore, the impact of these changes on the effectiveness of third-wave interventions cannot be fully considered.

Clinical Implications

At present the evidence base for third-wave interventions for people diagnosed with an eating disorder is relatively small compared to the evidence base for other therapies (e.g., NICE, 2004). Furthermore, methodological weaknesses have been identified in the research. It is therefore difficult to recommend any of the individual third-wave interventions covered by this review as an alternative to CBT, IPT or CAT at present.

Despite the methodological concerns about this pool of research, it appears that group and mixed intervention protocols yield greater effect sizes when compared to individual based interventions. Clinicians and researchers may therefore wish to incorporate group of mixed interventions into their practice as opposed to individual protocols.

DBT, as the most widely evidenced third-wave therapy in this review, has been evaluated in mixed, group and individual protocols, most of which have been adapted from the original Linehan (1993a, 1993b) protocol. Practitioners who wish to employ DBT interventions for people diagnosed with an eating disorder would therefore be encouraged to utilise the adapted versions of the Linehan (1993a, 1993) protocol.

The attrition rate for participants in the intervention arms of studies included in this review was 20.19%, which is similar to the 25% found by Shapiro et al. (2007), who investigated CBT for people diagnosed with Bulimia Nervosa. The findings that one-fifth of participants dropped out of third-wave interventions suggests that these treatments are not universally acceptable to clients. Clinicians therefore need to carefully consider which individuals are assigned to different treatments in clinical practice to maximise potential benefits.

Limitations of the review

The current review included only studies that had a sample size of greater than five. A number of case studies and case series were therefore excluded from this review. Many of these case studies may have found positive results with respect to third-wave interventions' efficacy in treating eating pathology. However, due to their very small sample sizes it would have been very difficult to generalise their effectiveness to wider patient groups, making it difficult to judge their impact upon the wider research.

It is also possible that publication bias was involved, with a greater likelihood of successful case series being reported and biasing the outcomes accordingly. A decision was also made to exclude papers that were not published in English, which limits the generalisability of this review to non-English speaking cultures. Egger et al. (1997) highlight that researchers are more likely to publish significant results in English journals compared to non-English journals. While Egger et al. (1997) raise the possibility of an English-language bias, a recent meta-analysis compared reviews which do, or do not, exclude non-English papers and found no evidence of bias (Morrison et al., 2012). Given the conflicting arguments surrounding a non-English publication bias, the influence of excluding non-English papers in this review needs to be considered.

The review obtained studies from two electronic databases, PsycInfo and Web of Science. These databases were judged to be appropriate for the purposes and scope of the review as they contained the most commonly used specialist eating disorder journals. It should be noted, however, that some studies may not have been published in the most commonly used journals, and therefore might not have been captured using only two databases. Future replication of this review might therefore include additional databases such as EMBASE, PubMed or The Cochrane Library.

It was not possible to calculate effect sizes for all studies included in this review due to missing data. It is therefore difficult to assess the effectiveness of these interventions in-line with studies that did provide enough data to calculate effect sizes. More weight has been given to the conclusions of studies from which effect sizes could be calculated, which might have influenced the outcomes of this review. It should therefore be considered that conclusions of this review may not necessarily a true reflection of the outcomes from therapy, but instead a reflection of how the data have been presented in the research so far.

Due to the scope of this study, all effect sizes were calculated based upon changes in eating pathology. It should be noted that third-wave interventions might have had differing effects on non-eating psychopathology, which were not evaluated in this review. Future reviews should consider the effect sizes of non-eating psychopathology to evaluate the full range of potential benefits of third-wave interventions for people diagnosed with an eating disorder.

A meta-analysis was not conducted within this review. The substantial heterogeneity within the clinical populations, types of intervention and outcome measures would have made coherent groupings difficult. Higgins and Thompson (2002) suggest the use of the I^2 statistic to summarise the impact of heterogeneity upon the outcomes of a meta-analysis. However, within this study it would have been in the presence of the additional conceptual difficulty of combining disparate psychotherapeutic interventions into one category.

Two trainee Clinical Psychologists co-rated the quality of each paper included in this study, using the bespoke POSMAT tool. A percentage agreement of 63% was obtained following the first round of quality analysis. While this level of agreement was discussed and disagreements were resolved prior to the completion of the review, 63% is still substantially lower than the 75% recorded by Ost (2008) in the first study to use the POSMAT. It is worth considering that the reviewers in Ost (2008) received specialist training in the instrument prior to their review, which was not feasible to the two reviewers for this paper.

Further Research

It is worth noting that effect sizes shown for third-wave interventions are similar to those found for NICE (2004) recommended psychological interventions. Fairburn et al. (2015) found within-group effect sizes for eating pathology improvements of *d* = 1.11

for CBT-E and *d* = 1.29 for IPT within a sample of people diagnosed with various eating disorders. Similarly, Wonderlich, Peterson, Crosby, Smith, Klein and Crow (2014) found effect sizes for CBT-E of *d* = 0.71-1.3, and *d* = 0.83-1.5 for Integrated Cognitive Affective Therapy (ICAT) in a sample of participants diagnosed with Bulimia Nervosa. These are similar to the effect sizes found for DBT, ACT, Mindfulness and Schema Therapy found within this review. The similarities of within-group effect sizes for improvements in eating pathology suggest that future research is warranted to build a robust evidence base for third-wave interventions and to allow a true comparison to the currently recommended interventions.

Future research into the efficacy of third-wave interventions for people diagnosed with an eating disorder should address the methodological weaknesses highlighted in this review. The primary focus of future research should be to test the efficacy of third-wave interventions against previously established treatment protocols such as CBT, CAT or IPT. The use of randomised controlled trials (RCTs) is recommended. At present, the use of RCTs is sparse within this field of research, making meaningful comparisons between the therapeutic interventions difficult. Comparisons between third-wave and other established therapies should also consider any potential moderators that predict if pre-treatment factors indicate who should be offered specific interventions, or if some participants are more likely to benefit from one type over the other.

Future research should also investigate whether any sub-groups of people diagnosed with an eating disorder are more likely to drop-out of psychological intervention. Results from this review show that one-fifth of participants dropped-out of third-wave interventions and a previous review into CBT (Shapiro et al. 2007) demonstrated a one-quarter drop-out rate suggesting that not all participants are able

to engage with therapy. At present, it is unknown if those who drop out from CBT or third-wave interventions share any overlap or if they are differing populations. Future comparative studies could help show if those who drop-out of either form of intervention share characteristics, or if one form of intervention is more acceptable to certain individuals.

Conclusions

Several third wave interventions show early promise in terms of their effectiveness in treating eating pathology among those diagnosed with an eating disorder. At present, the evidence for third-wave interventions is not sufficient to recommend the use of any of these interventions as an alternative to NICE (2004) recommended psychotherapies, such as CBT, IPT and CAT. Future research should look to build on the early promise of third-wave interventions, focusing on the use of randomised controlled studies that directly compare third-wave interventions to more established psychological therapies, and determine who benefits most from which therapeutic approach.

References

Baer, R. A., Fischer, S., & Huss, D. B. (2005). Mindfulness and acceptance in the treatment of disorder eating. *Journal of Rational-Emotive & Cognitive-Behaviour Therapy, 23,* 281-300. doi:10.1007/s10942-005-0015-9

Ben-Porath, D. D., Wisniewski, L., Warren, M. (2009). Differential treatment response for eating disordered patient with and without comorbid borderline personality diagnosis using a dialectical behaviour therapy (DBT) informed approach. *Eating Disorders, 17,* 225-241. doi:10.1080/10640260902848576

Byrne, S. M., Fursland, A., Allen, K. L., & Watson, H. (2011). The effectiveness of enhanced cognitive behavioural therapy for eating disorders: An open trial. *Behaviour Research and Therapy, 49,* 219-226. doi: 10.1016/j.brat.2011.01.006

Chen, E. Y., Matthews, L., Allen, C., Kuo, J. R., & Linehan, M. M. (2008). Dialectical behaviour therapy for clients with binge-eating disorder or bulimia nervosa and borderline personality disorder. *International Journal of Eating Disorders, 41,* 505-512. doi:10.1002.eat.20522

Cooper, Z., & Fairburn, C. M. (1987). The Eating Disorder Examination: A semi-structured interview for the assessment of the specific psychopathology of eating disorders. *Eating Disorders, 6.* 1-8. doi:10.1002/1098-108X(198701)6:1<1::AID-EAT2260060102>3.0.CO;2-9

Courbasson, C., Nishikawa, Y., & Dixon, L. (2012), Outcome of dialectical behaviour therapy for concurrent eating and substance use disorders. *Clinical Psychology and Psychotherapy, 19,* 434-449. doi:10.1002/cpp.748

Dimidjian, S., Arch, J. J., Schneider, R. L., Desormeau, P., Felder, J. N., & Segal, Z. V. (2016). Considering meta-analysis, meaning, and metaphor: A systematic review and critical examination of "Third wave" cognitive and behavioural therapies. *Behaviour Therapy, 47,* 886-905. doi: 10.1016/j.beth.2916.07.002

Egger, M., Zellweger-Zahner, T., Schneider, M., Junker, C., Lengeler, C., & Antes, G. (1997). Language bias in randomised controlled trials published in English and German. *The Lancet, 350,* 326-329. Doi:10.1016/S0140-6736(97)02419-7

Fairburn, C. G., Bailey-Straebler, S., Basden. S., Doll, H. A., Jones, R., Murphy, R., …Cooper, Z. (2015). A transdiagnostic comparison of enhanced cognitive behaviour therapy (CBT-E) and interpersonal psychotherapy in the treatment of eating disorders. *Behaviour Research and Therapy, 70,* 64-71. doi.org/10.1016/j.brat.2015.04.010

Fairburn. C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self report questionnaire? *International Journal of Eating Disorders, 16.* 363-37, doi:10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.Co;2-#

Gale, C., Gilbert, P., Read, N., & Goss, K. (2014). An evaluation of the impact of introducing compassion focussed therapy to a standard treatment programme for people with eating disorders. *Clinical Psychology and Psychotherapy, 21,* 1-12. doi: 10.1002/cpp.1806

George, L., Thornton, C., Touyz, S. W., Waller, G., & Beumont, P. J. V. (2004). Motivational enhancement and schema-focussed cognitive behavioural therapy in the treatment of chronic eating disorders. *Clinical Psychologist, 8.* 81-85. doi:10.1080/13284200412331304054

Goss, K., & Allan, S. (2010). Compassion focussed therapy for eating disorders. *International Journal of Cognitive Therapy, 3,* 141-158. doi:10.1521/ijct.2010.3.2.141

Hartmann, A. S., Thomas, J. J., Greenberg, J. L., Rosenfield, E. H., & Wilhelm, S. (2015). Accept, distract or reframe? An exploratory experimental comparison of strategies for coping with intrusive body image thoughts in anorexia nervosa and body dysmorphic disorder. *Psychiatry Research, 225,* 643-650. doi:10.1016/j/psychres.2014.11031

Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioural and cognitive therapies. *Behavior Therapy, 35,* 639-665. doi:10.1016/s0005-7894(04)80013-3

Heffner, M., Sperry, J., Eifert, G. H., Detweiler, M. (2002). Acceptance and commitment therapy in the treatment of an adolescent female with anorexia nervosa: A case example. *Cognitive and Behavioral Practice, 9,* 232-236. doi:10.1016/S1077-7229(02)00053-0

Higgins, J. P. T., & Thompson, S. G. (2002). Quantifying heterogeneity in a meta-analysis. *Statistics in Medicine, 21,* 1539-1558. doi:10.1002/sim.1186

Hill, D. M., Craighead, L. W., & Safer, D. L. (2011). Appetite-focussed dialectical behaviour therapy for the treatment of binge eating with purging: A preliminary trial. *International Journal of Eating Disorders, 44,* 249-261. doi:10.1002/eat.20812

Juarascio, A., Shaw, J., Forman, E., Timko,. C. A., Herbert, J., Butryn, M., Bunnell, D., Matteucci, A., & Lowe, M. (2013). Acceptance and commitment therapy as a

novel treatment for eating disorders: An initial test of efficacy and mediation. *Behavior Modification, 37,* 459-489. doi:10.1177/0145445513478633

Kristeller, J. L., & Hallett, C. B. (1999). An exploratory study of a meditation-based intervention for binge eating disorder. *Journal of Health Psychology, 4,* 357-363. doi:10.1177/135910539900400305

Kristeller, J., Wolever, R. Q., & Sheets, V. (2014). Mindfulness-based eating awareness training (MB-EAT) for binge eating: A randomised clinical trial. *Mindfulness, 5.* 282-297. doi:10.1007/s12671-012-0179-1

Kroger, C., Schweiger, U., Sipos, V., Kliem, S., Arnold, R., Schunert, T., & Reinecker, H. (2010). Dialectical behaviour therapy and an added cognitive behavioural treatment module for eating disorders in women with borderline personality disorder and anorexia nervosa who failed to respond to previous treatments. An open trial with 15-month follow-up. *Journal of Behavior Therapy and Experimental Psychiatry, 41,* 381-388. doi:10.1016/j.jbtep.2010.04.001

Lenz, S. A., Taylor, R., Fleming, M., Serman, N. (2014). Effectiveness of dialectical behaviour therapy for treating eating disorders. *Journal of Counselling and Development, 92,* 26-35. doi:10.1002/j.1556-6676.2014.001127

Linehan, M. M. (1993a). *Cognitive-Behavioural Treatment of Borderline Personality Disorder*. New York, NY: Guilford Press

Linehan, M. M. (1993b). *Skills Training Manual for Treating Borderline Personality Disorder.* New York, NY: Guilford Press

McIntosh, V. V. W., Jordan, J., Carter, J. D., Framptom, C. M. A., McKenzie, J. M., Latner, J. D., & Joyce, P. R. (2016). Psychotherapy for transdiagnostic binge

eating: A randomised controlled trial of cognitive-behavioural therapy, appetite-focussed cognitive-behavioural therapy and schema therapy. *Psychiatry Research, 240,* 412-420. doi:10.1016/j.psychres.2016.04.080

Manlick, C. F., Cochran, S. M., & Koon, J. (2013). Acceptance and commitment therapy for eating disorders: Rationale and literature review. *Journal of Contemporary Psychotherapy, 43,* 115-122. doi: 10.1007/s10879-012-9223-7

Merwin, R. M., Zucker, N. L., & Timko, C. A. (2013). A pilot study of an acceptance-based separated family treatment for adolescent anorexia nervosa. *Cognitive and Behavioural Practice, 20.* 485-500, doi:10.1016/j.cbpra.2012.11.001

Morrison, A., Polisena, J., Husereau, D., Moulton, K., Clark, M., Fiander, M., …Rabb, D. (2012). The effect of English-language restriction on systematic review-based meta-analyses: A systematic review of empirical studies. *International Journal of Technology Assessment in Health Care, 28,* 138-144. doi:10.1017/S0266462312000086

National Institute of Health and Care Excellence. (2004). *Clinical Guidance 9: Eating Disorders in over 8's: management.* Retrieved from: https://www.nice.org.uk/guidance/cg9

Ost, L. G. (2008). Efficacy of the third wave of behavioural therapies: A systematic review and meta-analysis. *Behaviour Research and Therapy, 46,* 296-321. doi:10.1016/j.brat.2007.12.005

Palmer, R. L., BIrchall, H., Damani, S., Gatward, N., McGrain, L., & Parker, L. (2003). A dialectical behaviour therapy program for people with an eating disorder and

borderline personality disorder – description and outcome. *International Journal of Eating Disorders, 33,* 281-286. doi:10.1002/eat.10141

Parling, T., Cernvall, M., Ramklint, M., Holmgren, S., & Ghaderi, A. (2016). A randomised trial of acceptance and commitment therapy for anorexia nervsa after daycare treatment, including five-year follow-up. *BMC Psychiatry, 16.* doi:10.1186/s12888-016-0975-6

Safer, D. L., & Joyce, E. E. (2011). Does rapid response to two group psychotherapies for binge eating disorder predict abstinence? *Behaviour Research and Therapy, 49,* 339-345. doi:10.1016/j.brat.2011.03.001

Safer, D. L., Robinson, A. H., & Jo. B. (2010). Outcome from a randomised controlled trial of group therapy for binge eating disorder: comparing dialectical behaviour therapy adapted for binge eating to an active comparison group therapy. *Behavior Therapy, 41,* 106-120. doi:10.1016/j.beth.2009.01.006

Safer, D. L., Telch, C. F., & Agras, S. (2001). Dialectical behaviour therapy for bulimia nervosa. *American Journal of Psychiatry, 158,* 632-634. doi: 10.1176/appi.ajp.158.4.632

Shapiro, Berkman, N. D., Brownley, K. A., Sedway, J. A., Lohr, K. N., & Bulik, C. M. (2007). Bulimia nervosa treatment: A systematic review of randomised controlled trials. *International Journal of Eating Disorders, 40,* 321-336. doi:10.1002/eat.20372

Simpson, S. G., Morrow, E., van Vreeswijk, M., & Reid, C. (2010). Group schema therapy for eating disorder: A pilot study. *Frontiers in Psychology, 1,* 182. doi:10.3389/fpsyg.2010.00182

Telch, C. F., Agras, S., & Linehan, M. M. (2000). Group dialectical behaviour therapy for binge-eating disorder: A preliminary, uncontrolled trial. *Behavior Therapy, 31,* 569-582. doi:10.1016/s0005-7894(00)80031-3

Telch, C. F., Agras, S., & Linehan, M. M. (2001). Dialectical behaviour therapy for binge eating disorder. *Journal of Consulting and Clinical Psychology, 69,* 1061-1065. doi:10.1037//0022-006X.69.6.1061

Timko, C. A., Zucker, N. L., Herbert, J. D., Rodriguez, D., Merwin, R. M. (2015). An open trial of acceptance-based separated family treatment (ASFT) for adolescents with anorexia nervosa. *Behaviour Research and Therapy, 69,* 63-74. doi:10.1016/j.brat.2015.03.011

Wonderlich, S. A., Peterson, C. B., Crosby, R. D., Smith, T. L., Klein, M. H., Mitchell, J. E., & Crow, S. J. (2014). A randomized controlled comparison of integrative cognitive-affective therapy (ICAT) and enhanced cognitive-behavioural therapy (CBT-E) for bulimia nervosa. *Psychological Medicine, 44,* 543-553. doi:10.1017/S0033291713001098

Section 2

Research Report

The development and validation of a measure of eating-specific interpersonal problems: The Interpersonal Relationships in Eating Disorders (IR-ED) scale

Abstract

Objectives. Clinical reports suggest that interpersonal problems are associated with the onset and maintenance of eating pathology. Therefore, the aim of this study was to develop an eating-pathology-specific measure of interpersonal problems, with strong psychometric characteristics and better clinical utility than existing generic measures of interpersonal problems.

Method. A new eating-pathology-specific measure of interpersonal problems, known as the Interpersonal Relationships in Eating Disorders (IR-ED) was created by the study team. A community sample completed online psychometric questionnaires, including the IR-ED, a generic measure of interpersonal problems, and measures of depression, anxiety, social anxiety, and eating pathology. Principal components analysis determined the internal structure of the IR-ED, and a series of tests investigated the convergent and discriminant validity of the IR-ED.

Results. A final 15-item version of the IR-ED demonstrated three distinct and reliable sub-factors - Food-related isolation; Avoidance of body evaluation; and Food-related interpersonal tension. The IR-ED was related to the generic measure of interpersonal problems, and both were associated with depression, anxiety and social anxiety. However, the IR-ED was more strongly associated with eating pathology than the generic interpersonal problems measure. The IR-ED was also superior in distinguishing those who reported a history of being diagnosed with an eating disorder, and in differentiating individuals who fell within different body mass index categories.

Conclusions. The IR-ED has strong psychometric properties. It is equivalent to a more generic measure of interpersonal problems in explaining mood and anxiety problems, but the IR-ED is superior in explaining eating pathology.

Practitioner Points

Clinical Implications

- The IR-ED is a robust and reliable measure of eating-specific interpersonal problems, suitable for use in clinical settings.
- In understanding eating pathology, the IR-ED is superior to a generic measure of interpersonal problems.
- The IR-ED has the potential to assist in the formulation of cases and in assessing progress and outcomes in the treatment of eating disorders.

Limitations

- The IR-ED's factor structure was based on a sample of healthy females. Therefore, further work is needed to replicate the factor structure among other groups, including people who experience clinical eating pathology.
- The overwhelming majority of the sample used were from within the UK.

Introduction

Interpersonal Problems

Interpersonal problems are difficulties in how people relate to, compare themselves to, or interact with others. Interpersonal problems have been linked with many psychological difficulties, such as compulsive hoarding (Grisham, Steketee, & Frost, 2008), agoraphobia (Kleiner, & Marshall, 1987), anxiety (Eng, & Heimberg, 2006), borderline personality disorder (Lazarus, Cheavens, Festa, & Rosenthal, 2014), and major depressive disorder (Barrett, & Barber, 2007).

The contemporary literature often measures interpersonal problems using generic measures, such as the Inventory of Interpersonal Problems–32 (IIP-32; Barkham, Hardy, & Startup, 1996). As the above research suggests, such measures can be useful in detecting interpersonal problems in general. However, within some clinical domains there are problems with using such generic measures as a clinical tool. In particular, McEvoy, Burgess, Page, Nathan and Fursland (2013) suggest that the IIP-32 has limited utility in detecting interpersonal problems in eating disorder patients. Five out of eight IIP-32 subscales were not related to variance in eating pathology, limiting the tool's clinical value.

Interpersonal Problems in Eating Behaviour

Reports suggest that interpersonal problems can influence non-clinical eating concerns and behaviours (Lieberman, Gauvin, Bukowski, & White, 2001; Broberg, Hjalmers, & Novenen, 2001, Tanofsky-Kraff, Wilfrey, & Spurrell, 2000) and clinical eating disorders (Lampard, Byrne, & McLean, 2011; Rieger et al., 2010). Such interpersonal problems are relatively generic, including: non-assertiveness, submissiveness, social inhibition, being dependent on the opinions of others, being unable to express feelings

to others, not understanding others' perspectives, a lower capacity to deal with strangers, and expressing distress (Arcelus, Haslam, Farrow, & Meyer, 2013; Carter, Kelly, & Norwood, 2012; Duchesne et al., 2012; Hartmann, Zeeck, & Barrett, 2009; Hilbert et al., 2007; Lampard, Byrne, & McLean, 2011).

There are also several interpersonal consequences of abnormal eating that appear to maintain eating concerns (e.g., Abraham, & Beumont, 1982; Murphy, Straebler, Basden, Cooper, & Fairburn, 2012; Schmidt, & Treasure, 2006). These difficulties include: a lack of intimacy, interpersonal role disputes, deceit, secrecy, isolating the self, role transitions, complicated grief, and achieving life goals. These are generally more specific to eating related behaviours, and overlap only partially with the more general constructs measured by non-eating measures such as the IIP-32. Further to specific interpersonal problems, the general concepts of interpersonal problems have been hypothesised as being key factors in the onset and maintenance of eating pathology (Fairburn, Cooper, & Shafran, 2003). To understand the true link between interpersonal problems and eating pathology, it might be necessary to develop a measure that is more specific to this clinical presentation.

The present study details the development of an eating-pathology-specific measure of interpersonal problems. Being able to detect interpersonal problems that are specific to eating pathology could provide clinicians and those running prevention programmes with greater insight into what specific interpersonal problems are likely to be involved in disordered eating. Thus, an eating pathology-specific interpersonal problems measure could inform formulation and treatment, allowing more focused and targeted interventions or prevention programmes.

Aim and Hypotheses

The aim of this study is to generate and validate a measure of interpersonal problems related to eating pathology. To demonstrate psychometric and clinical utility, the measure should:

1) Display a clear factor structure with adequate internal consistency of the resulting scales.
2) Show strong stability over time (test-retest reliability).
3) Correlate moderately with generic measures of interpersonal problems.
4) Predict a strong degree of variance in measures of social anxiety, anxiety and depression (comparable with a generic measure of interpersonal problems).
5) Predict a greater degree of eating pathology than a generic interpersonal problems measure.

Method

Ethics

Ethical approval for this study was provided by the University of Sheffield Ethical Review Committee (Application Reference Number: 007874, Appendix B).

Participants were required to read and acknowledge a study information sheet (Appendix C) and to provide their informed consent (Appendix D) prior to accessing the study. After completing the study, participants were shown an electronic debrief sheet (Appendix E), which explained the purpose of the study and signposted them to further information or support should they wish to access it. Participants were asked to provide their email addresses upon completion of the study, allowing them to be contacted two weeks post-completion to request their participation in the follow-up. Once the two

data sets were linked, participants' email addresses and IP addresses were deleted from the data files.

Design

The study utilised a mixed correlational and comparative design to validate the newly developed measure. The aim was to validate the new interpersonal problems measure by recruiting a community sample of participants. As such, participants who reported an eating disorder were not included in the development stage. However, those who reported a past or current eating disorder diagnosis were compared with the non-clinical participants in the validation stage.

Participants

Participants were recruited into this study using the University of Sheffield's student recruitment email list, which sent an email invitation (Appendix F) to all currently enrolled students and staff who had not asked to be excluded from the list. In addition, participants were also recruited by placing adverts on Facebook (Appendix G) and Twitter (Appendix H).

Figure 1 shows the numbers of potential participants who completed the different stages of the study. One-thousand and ninety-one people logged onto the study, but 502 (46%) dropped out without completing any of the measures. A further 58 participants dropped out while completing the various measures, meaning that 531 participants completed all study measures. A total of 261 completers provided their email addresses and consented to be contacted for a follow-up, with 142 participants going on to complete the re-test stage (54.4%).

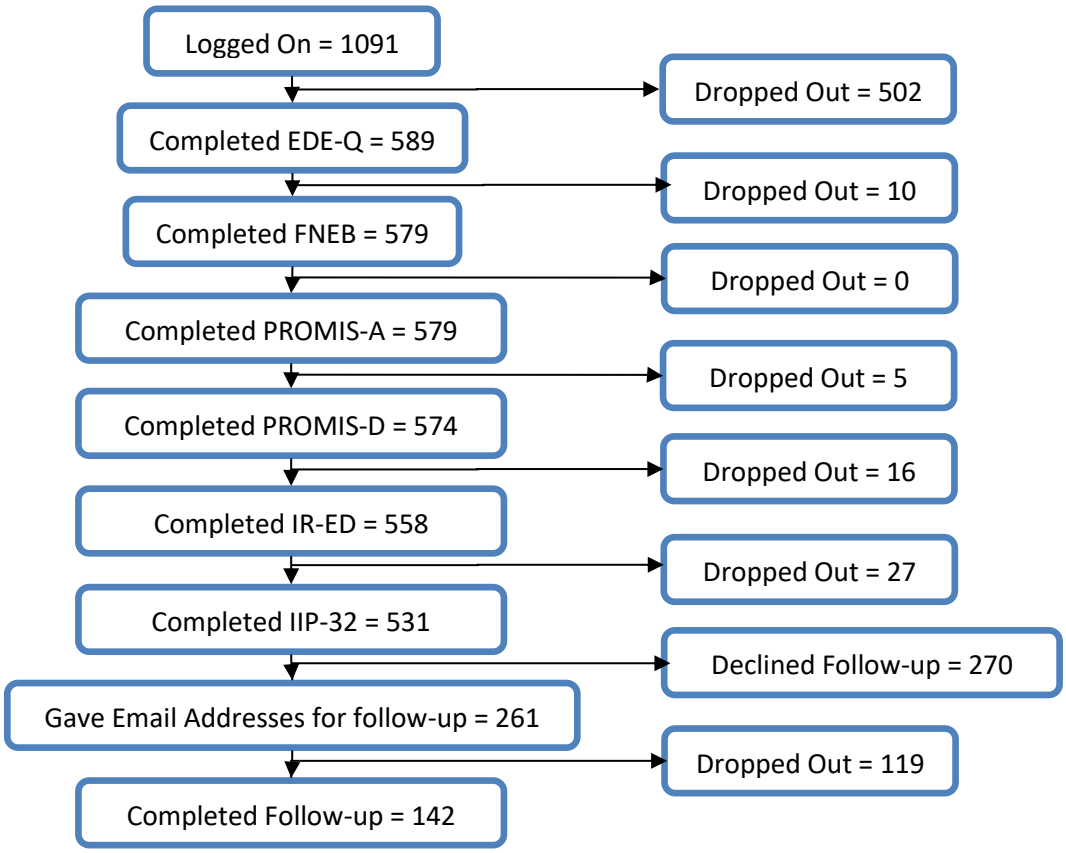

Figure 1. Participant drop-out. *Note:* EDE-Q, Eating Disorder Examination - Questionnaire; FNEB, Fear of Negative Evaluation – Brief; PROMIS-A, Patient Reported Outcomes Measurement Information System – Anxiety; PROMIS-D, Patient Reported Outcomes Measurement Information System – Depression; IR-ED, Interpersonal Relationships in Eating Disorders; IIP-32, Inventory of Interpersonal Problems – 32.

Characteristics of the 531 participants who completed all study measures can be found in Table 1. Thirty-one participants (5.83%) reported that they had a current or past eating disorder diagnosis. Participants who did not report an eating disorder diagnosis had mean Body Mass Index (BMI) levels that were slightly overweight (>25.0), but in the normal range for the United Kingdom (Barker, 2017). Most of the sample were UK-based (91%), with the next largest contributor being the USA (2.64%) (see Appendix I).

Table 1. Demographic information for participants who completed all measures.

	Without Diagnosis					With Eating Disorder Diagnosis				
	N	Age	(*SD)*	BMI	*(SD)*	N	Age	*(SD)*	BMI	*(SD)*
Male	134	37.43	*(13.57)*	26.64	*(4.66)*	2	23.00	*(7.07)*	31.50	*(9.73)*
Female	364	33.13	*(11.38)*	25.10	*(6.49)*	29	26.34	*(8.05)*	21.15	*(4.16)*
Unknown	2	24.50	*(7.78)*	23.56	*(4.76)*	0	-	-	-	-

Measures

Each participant completed the following six measures.

Interpersonal Relationships in Eating Disorders scale (IR-ED, Appendix J; 26 item version). The IR-ED was developed for the purposes of this study and originally consisted of 26 items. The measure asked participants to rate the presence of the questionnaire items, using a 5-point Likert scale ranging from 1 ("Not at all") to 5 ("All the time"). A detailed description of the IR-ED's development is detailed below (see Procedure).

Inventory of Interpersonal Problems (IIP-32, Barkham, Hardy & Startup, 1996; Appendix K). The IIP-32 is a 32-item questionnaire, with each item scored on a 5-point Likert scale ranging from "not at all" (0) to "extremely" (4). Confirmatory factor analysis suggests an eight-factor structure, and validation studies suggest that the global scale has acceptable reliability ($\alpha = 0.87$) and test-retest reliability ($r = 0.7$) (Barkham, Hardy, & Startup, 1996).

Eating Disorder Examination Questionnaire (EDE-Q, Fairburn, 2008; Appendix L). The EDE-Q is a 41-item measure which was adapted from the Eating Disorder Examination clinical interview by Fairburn and Beglin (1994). The EDE-Q has four attitudinal sub-scales; Restraint, Weight Concern, Shape Concern and Eating Concern. The EDE-Q shows significant positive correlations with eating disorder symptomology

such as binge eating, self-induced vomiting, laxative misuse and diuretic misuse. In addition, reliability coefficients range from 0.78 to 0.93 for the four subscales, and all sub-scales are significantly correlated at 2-week retest follow-up (Luce, & Crowther, 1999). The EDE-Q also asks the participant to self-report their height and weight, which were used to calculate BMI. The EDE-Q scores used to assess eating pathology in this study were calculated using the mean of the four attitudinal subscale totals. The behavioural frequency items (13-18) were not assessed.

Fear of Negative Evaluation Brief (FNEB, Leary, 1983; Appendix M). The FNEB is a 12-item measure of social anxiety. Items are rated on a five-point Likert scale. It has high internal consistency ($\alpha = 0.97$), and discriminates people with social phobia and panic disorder, and those from a community sample (Collins, Westra, Dozois, & Stewart, 2005). Test-retest reliability is also high ($r = 0.94$).

Patient-Reported Outcomes Measurement Information System – Depression (PROMIS-D, Pilinkos et al., 2011; Appendix N). The PROMIS-D is an eight-item questionnaire measuring depression (Pilinkos et al., 2011). The measure uses a 5-point Likert scale ranging from "never" to "always". The measure has high internal consistency ($\alpha = 0.95$) and convergent validity ($r = 0.83$).

Patient-Reported Outcomes Measurement Information System – Anxiety (PROMIS-A, Pilinkos et al., 2011; Appendix O). The PROMIS-A is a seven-item questionnaire measuring anxiety (Pilinkos et al., 2011). The measure uses a 5-point Likert scale ranging from "never" to "always". It has high internal consistency ($\alpha = 0.93$) and high convergent validity ($r = 0.8$).

Procedure

The IR-ED was developed through several iterations by the research team. An initial draft containing 28 items was developed by SJ and GW based upon clinical

experience and a prior literature search of interpersonal problems in eating disorders. The initial draft measure was shared with research colleagues in Australia (SB, BR & AF), who reviewed the initial draft and added in items based upon their own clinical experience. The resultant draft contained 49 items, which were reviewed iteratively by the research teams, leading to similar items being omitted or merged. This iterative process led to a final measure containing 26 items. The research team reviewed the final measure and agreed on the initial face validity of the items before moving forward with the project. The scoring system involved asking participants to endorse the items based on a 5-item Likert scale, where higher scores indicate a greater presence of the specific item based on their experience over the past 28 days. A 5-point Likert scale was used to balance precision of response with ease of completion. The choice to ask participants to rate their experiences over the past 28 days aimed to protect against daily fluctuations from overly influencing the outcomes of the measure, and to gain a more stable picture of the client's experience over time in a similar way to the commonly used EDE-Q.

This measure was completed on two occasions, to determine its test-retest reliability.

All measures in this study were presented using the Qualtrics system (Qualtrics, 2016). The Qualtrics system allows participants to remotely log on to the study by following a bespoke hyperlink, and then stores data securely ready to be downloaded for analysis. The Qualtrics system also records the IP address of the computer used to complete the study, and this information was used to identify the participants' locations. A second Qualtrics survey contained only the IR-ED for follow-up. A bespoke hyperlink to the follow-up IR-ED was emailed to consenting participants two weeks after they completed the initial study. After the follow-up, both email addresses and IP addresses were removed from the data set to maintain confidentiality.

Analysis

Hypothesis 1: Display a clear factor structure with adequate internal consistency. For this portion of the analysis, only female participants who did not report an eating disorder diagnosis were selected (*n* = 380) to protect against heterogeneity of participants overly influencing the factor analysis. Gorsuch (1983) suggests that a meaningful factor analysis requires 5-10 participants for each questionnaire item. The sub-sample of 380 participants used in this analysis far exceeded Gorsuch's (1983) requirement of 130-260 for a robust factor analysis.

Principal components analysis (PCA) was used to investigate the factor structure of the IR-ED. Different rotations were compared and the most appropriate model was used based on the coherence of the factors that emerged. Factors were retained if they had an eigenvalue of >1 (Dancey & Reidy, 2004) and following visual inspection of scree plots. Tang et al. (1998) recommend that individual items should be retained only if they load onto a specific factor by at least 0.4. For this study, a more stringent cut-off of 0.6 was used to ensure a more robust measure. Individual items were excluded if substantial cross-loading was detected (i.e., the difference in loadings between factors was less than 0.2), to ensure that the factors were as distinct as possible.

Cronbach's alpha was used to determine the internal consistency of the emergent factors within the IR-ED. Tavakol and Dennik (2011) suggest that a Cronbach's alpha of > .7 demonstrates acceptable reliability, while Streiner (2003) suggests that values > .9 suggest possible redundancy within the measure. Therefore, this range in alpha levels was regarded as desirable.

Hypothesis 2: Show strong stability over time (test-retest reliability). Test-retest reliability of the IR-ED was analysed using Pearson's correlations and paired t-tests. This subsample consisted of the 35 male and 107 female participants who

completed the study at time 1 and time 2, but who did not report any history of an eating disorder.

Hypothesis 3: Correlate moderately with generic measures of interpersonal problems. Pearson's correlations were used to determine the relationship between the IR-ED and the more generic IIP-32. O'Rourke and Hatcher (2013) suggest that the following values indicate the strength of correlation coefficients: weak (< .2), moderate (> .2 to < .8) or strong (> .8). All participants who completed both the IR-ED and the IIP-32 and who did not report any eating disorder history were included in this analysis (*n* = 500).

Hypothesis 4: Predict a strong degree of variance in measures of social anxiety, anxiety and depression (comparable to generic measures of interpersonal problems). The IR-ED and the IIP-32 were correlated with the relevant measures of psychopathology used within this study - PROMIS-A, PROMIS-D and FNEB. This analysis was carried out separately for males and females. Thereafter, simultaneous entry multiple regression was used to determine the levels of variance in psychopathology explained independently by the IR-ED and the IIP-32. All male (*n* = 134*)* and female (*n* = 364) participants who did not report an eating disorder diagnosis and who stated their gender were included in this analysis.

Hypothesis 5: Predict a greater degree of eating pathology than generic measures of interpersonal problems. Pearson's correlations were used to determine the EDE-Q's relationship with the IR-ED and the IIP-32. Simultaneous entry method multiple regression was used to assess the level of eating pathology variance explained by the IR-ED and the IIP-32. Finally, partial Pearson's correlations were used to determine the relationship between the EDE-Q and the IR-ED and IIP-32 when controlling for other areas of psychopathology (PROMIS-A, PROMIS-D and FNEB). All

participants who did not report the presence of an eating disorder were included in these analyses (*n* = 500).

Supplementary Analyses: Participants who completed the study measures and provided their height and weight information (*n* = 515) were divided into four BMI categories – underweight (BMI < 18.5), healthy weight (BMI between 18.5 and 24.9), overweight (BMI between 25 and 29.9), and obese (BMI > 30) using current NHS guidelines (NHS Choices, 2016). ANOVAs (with post hoc Tukey's HSD tests) were conducted to investigate whether those in the different BMI categories significantly differed in their IR-ED and IIP-32 scores.

A series of independent samples t-tests were used to determine whether there were differences between scores on the IR-ED and the IIP-32 for participants who reported any history of an eating disorder and those who did not.

Results

Hypothesis 1: Display a clear factor structure with adequate internal consistency.

Table 2 shows the results of the factor analysis. A varimax rotation provided the best solution (with strong, psychologically meaningful factors). It revealed three factors, based on 15 of the 26 original IR-ED items. None of the items needed to be excluded for reasons of cross-loading. The relatively stringent cut-off of including only loadings greater than 0.6 made no difference to the number of items that would have been retained if a cut-off of 0.4 had been used.

The first of the three factors was labelled Food-Related Isolation (FRI). It consisted of items 3, 5, 15, 18, 22 and 25, and accounted for 17.56% of the variance in scores. The second factor was Avoidance of Body Evaluation (ABE), which contained items 1, 6, 9, 11 and 24 and accounted for 15.63% of the variance in scores. The final

factor was Food-related Interpersonal Tension (FIT), which consisted of items 8, 12, 16 and 23 and accounted for 12.32% of variance in scores. Internal consistencies for each scale are also shown in Table 2 and show that all three scales meet the criteria for acceptable internal consistency without redundancy of items. Thus, these findings support hypothesis 1, regarding the factor structure and internal consistency of the IR-ED.

Item mean scores on the three IR-ED scales were calculated (sum of the relevant items/number of items). These are reported in Table 2. The final, 15-item version of the IR-ED and scoring key are presented in Appendix P.

Hypothesis 2: Show strong stability over time (test-retest reliability).

Results from test-retest analysis can be found in Table 3. All IR-ED factors demonstrated significant correlations between time 1 and time 2 ($r \geq .74$). No scales showed significant differences between time 1 and time 2 testing, except for Avoidance of Body Evaluation in females, where there was a small but significant increase over time. Thus, hypothesis 2 is broadly supported.

Hypothesis 3: Correlate moderately with generic measures of interpersonal problems.

Table 4 reports individual correlation coefficients between the sub-scales of the IR-ED and the IIP-32. Due to the number of correlations undertaken, an alpha value of 0.001 was set to protect against type 1 errors. All IR-ED sub-scales were associated with the IIP-32 sub-scales except for the IR-ED Food-Related Interpersonal Tension and the IIP-32 Too Open scale. Most of the significant correlation coefficients were above the "weak" criterion of >.2, with many being within the "moderate" range (between .4 and .8). Results from the correlation analysis suggest a relationship between the IR-ED and the IIP-32, which supports hypothesis 3.

Table 2.

Principal Components Analysis (Varimax rotation) of the IR-ED measure for females who did not report an eating disorder diagnosis (*N* = 380) with item mean scores and internal consistency of resulting scales. Items where loadings are in bold were retained in that factor in the final version of the IR-ED.

	Items *Thinking about your experiences with others over the past 28 days, how much would you say the following statements have applied to you?*	**Factor 1** Food- related isolation	**Factor 2** Avoidance of body evaluation	**Factor 3** Food-related interpersonal tension
1	I find it hard to spend time with others because I worry what they think about my body	.422	**.656**	.147
2	I worry what others would think of my if they knew how I eat	.553	.508	.257
3	I avoid social situations where eating is involved	**.748**	.320	.077
4	My appearance allows me to stand out amongst my peers	.100	.310	.056
5	I avoid getting into conversations with others about food	**.708**	.304	.097
6	I avoid socialising with people who are likely to comment on my body or appearance	.344	**.715**	.131
7	Eating the way I do helps me to cope with my anxiety in social situations	.384	.287	.261
8	Other people try to pressure me into eating differently	.120	.239	**.718**
9	I avoid intimacy because I worry what others will think of my body	.202	**.759**	.127
10	Others admire my ability to control what I eat	.172	-.172	.083
11	I avoid certain activities that would mean other people might judge my body	.187	**.761**	.053
12	My pattern of eating often leads to disagreements or tension with others	.172	.180	**.742**
13	My appearance helps me feel that I fit in and am more accepted by others	-.141	-.071	.108
14	Other people try to pressure me into changing my appearance	-.063	.491	.583

15	My eating patterns make it hard for me to socialise as much as I would like to	**.759**	.190	.094
16	Other people worry about what I eat	.211	.045	**.795**
17	When I experience tension with others, I focus more on controlling my eating / weight	.242	.185	.229
18	I prefer to eat alone to avoid conflict with others about what I eat	**.710**	.225	.381
19	I worry that I spend too much time taking with other people about my appearance	.089	.160	.161
20	Controlling my weight helps me to feel more confident in social situations	.129	.225	.055
21	Worrying about my weight and appearance makes it difficult to feel really “connected” when I am with other people	.399	.496	.140
22	My eating patterns cause me to withdraw from others	**.697**	.188	.208
23	Eating the way I do makes it more likely that others will show concern for me	.322	-.058	**.616**
24	It is difficult to meet new people as I worry they are judging me or my appearance	.403	**.668**	.165
25	My eating patterns cause me to secretive or deceptive with others	**.646**	.204	.383
26	Eating the way I do helps me to communicate my feelings and needs to others	.194	.029	.290
	Eigenvalue	9.712	2.237	1.541
	Variance explained (Rotated)	17.56%	15.63%	12.32%
	Cronbach’s alpha	0.891	0.877	0.798
	Item mean (*SD*)	1.38 (0.70)	1.72 (0.93)	1.39 (0.6)

Table 3.

Test-retest reliability of IR-ED scales in males and females who did not report the presence of an eating disorder.

IRED Scale	Female (*N* = 107)						Male (*N* = 35)					
			Correlation		t-test				Correlation		t-test	
	Time 1 *Mean (SD)*	*Time 2* *Mean(SD)*	*r*	*P*	*t*	*P*	*Time 1* *Mean (SD)*	*Time 2* *Mean (SD)*	*r*	*P*	*t*	*p*
Food-related isolation	1.46 *(0.79)*	1.44 *(0.75)*	.922	.001	0.74	*NS*	1.25 *(0.63)*	1.31 *(0.70)*	.949	.001	1.78	*NS*
Avoidance of body evaluation	1.81 *(1.04)*	1.93 *(1.10)*	.924	.001	2.93	.004	1.35 *(0.69)*	1.52 *(0.79)*	.797	.001	2.03	*NS*
Food-related interpersonal tension	1.39 *(0.58)*	1.46 *(0.67)*	.832	.001	1.88	*NS*	1.24 *(0.46)*	1.34 *(0.49)*	.740	.001	1.72	*NS*

Table 4.

Pearson's correlations (*r*) between the IR-ED and Inventory of IIP-32, for all participants who did not report an eating disorder diagnosis *(N=500)*

	IIP-32 scale							
IR-ED scale	Hard to be sociable	Hard to be assertive	Too aggressive	Too open	Too caring	Hard to be supportive of others	Hard to be involved with others	Too dependent on others
Food-related isolation	.528*	.313*	.229*	-.209*	.347*	.267*	.438*	.354*
Avoidance of Body Evaluation	.554*	.357*	.291*	-.193*	.400*	.319*	.511*	.495*
Food-related interpersonal tension	.272*	.171*	.222*	-.004	.233*	.222*	.203*	.321*

* P<0.001

Hypothesis 4: Predict a strong degree of variance in measures of social anxiety, anxiety and depression (comparable to generic measures of interpersonal problems).

Correlations between measures of psychopathology and the IR-ED and IIP-32 are presented in Table 5. Due to the number of correlations undertaken, an alpha value of 0.001 was set to protect against type 1 errors. Most of the IR-ED and IIP-32 sub-scales significantly correlated with the PROMIS-A, PROMIS-D and the FNEB. In most cases, the correlations between psychopathology and the IR-ED or IIP-32 were stronger for females than for males. All correlations were moderate in strength, with none exceeding $r = .7$.

Results from the multiple regression analyses are divided by gender, and are presented in Tables 6 and 7. Both IR-ED and IIP-32 sub-scales contributed to the variance observed in the FNEB, PROMIS-A and PROMIS-D. IR-ED 'Avoidance of Body Evaluation' and IIP-32 'Too Dependent' were the sub-scales that significantly predicted scores on the most measures of psychopathology across both genders.

To summarise, the results from the correlational and regression analyses support hypothesis 4.

Table 5.

Pearson's correlations (*r*) between the IR-ED and the IIP-32) and PROMIS-D, PROMIS-A and the FNEB in non-clinical sample

	Female (N=364)			Male (N=134)		
	FNEB	PROMIS-A	PROMIS-D	FNEB	PROMIS-A	PROMIS-D
IR-ED scales						
Food-related isolation	.409*	.399*	.405*	.237	.231	.400*
Avoidance of body evaluation	.503*	.493*	.571*	.473*	.452*	.583*
Food-related interpersonal tension	.267*	.279*	.256*	.149	.175	.297*
IIP-32 scales						
Mean Total	.638*	.631*	.671*	.539*	.578*	.507*
Hard to be sociable	.528*	.564*	.567*	.398*	.341*	.349*
Hard to be assertive	.552*	.413*	.404*	.467*	.386*	.233
Too aggressive	.242*	.336*	.365*	.241*	.438*	.407*
Too open	-.165	-.142	-.190*	-.024	-.092	-.077
Too caring	.383*	.481*	.487*	.308*	.397*	.424*
Hard to be supportive of others	.242*	.302*	.349*	.378*	.383*	.287
Hard to be involved with others	.345*	.345*	.482*	.351*	.429*	.412*
Too dependent on others	.667*	.542*	.534*	.696*	.609*	.429*

* P < .001

Table 6.

Clinical validation of the IR-ED) and IIP-32 scales among a female non-clinical sample (*N* = 364), using multiple regressions to determine which scales are associated with clinical measures (PROMIS-A, PROMIS-D and the FNEB)

	Overall effect			Significant individual predictors			
Dependent variable	*F*	*P*	% variance explained	Independent variables	*t*	*P*	*Beta*
PROMIS-A	27.9	.001	44.9%	IR-ED Avoidance of Body Evaluation	2.64	.009	.152
				IIP Hard to be Sociable	4.35	.001	.270
				IIP Too Caring	4.67	.001	.214
				IIP Too Dependent	3.89	.001	.221
PROMIS-D	33.7	.001	49.8%	IR-ED Avoidance of Body Evaluation	4.61	.001	.254
				IIP Hard to be Sociable	3.37	.001	.199
				IIP Too Caring	4.52	.001	.198
				IIP Hard to be Involved	2.84	.005	.149
				IIP Too Dependent	3.42	.001	.185
FNEB	41.5	.001	55.1%	IR-ED Avoidance of Body Evaluation	3.37	.001	.176
				IIP Hard to be Assertive	4.39	.001	.212
				IIP Too Open	1.96	.05	-.081
				IIP Hard to be Supportive	2.25	.025	-.100
				IIP Too Dependent	9.69	.001	.496

Table 7.
Clinical validation of IR-ED and IIP-32 scales among a male non-clinical sample (*N* = 134), using multiple regressions to determine which scales are associated with clinical measures (PROMIS-A, PROMIS-D and the FNEB)

	Overall effect			Significant individual predictors			
Dependent variable	*F*	*P*	% variance explained	Independent variables	*t*	*P*	*Beta*
PROMIS-A	9.364	.001	41%	IIP Too Aggressive	2.65	.009	.212
				IIP Too Dependent	3.92	.001	.383
PROMIS-D	9.85	.001	42.3%	IR-ED Avoidance of Body Evaluation	3.55	.001	.374
				IIP Too Aggressive	2.77	.006	.218
				IIP Too Caring	2.14	.034	.175
FNEB	15.18	.001	54.0%	IRED Avoidance of Body Evaluation	2.83	.006	.266
				IIP Hard to be Assertive	2.05	.042	.169
				IIP Hard to be Involved	2.16	.033	-.230
				IIP Too Dependent	6.83	.001	.589

Hypothesis 5: Predict a greater degree of eating pathology than generic measures of interpersonal problems.

Pearson's correlations shown in Table 8 used an alpha of 0.001 to protect against type 1 error. Non-clinical male and females' EDE-Q scores generally had stronger relationships with the IR-ED subscales than with the IIP-32 sub-scales. When considering the male sample, only four of the IIP-32 subscales were significantly related to EDE-Q scores.

For males and females, the multiple regressions in Table 9 show that eating pathology was most strongly explained by the IR-ED Avoidance of Body Evaluation subscale.

When controlling for PROMIS-A, PROMIS-D and FNEB scores (Table 10), all IR-ED sub-scales for both males and females remained associated with EDE-Q scores. In contrast, far fewer of the IIP-32 scores remained associated with EDE-Q scores for males or females. Thus, it can be concluded that IR-ED scales' relationships with the EDE-Q are more robust than the IIP-32 scales. Given these findings, hypothesis 5 can be supported.

Supplementary Analyses

Association with BMI. Participants who gave their height and weight information were split into four categories based upon their Body Mass Index (BMI) - Underweight, Healthy Weight, Overweight, and Obese. ANOVAs showed that the IR-ED was far more effective in differentiating the four BMI groups than the IIP-32 (Table 11). The post hoc analyses suggest that the IR-ED is particularly viable for differentiating the normal/overweight groups from the more clinically concerning underweight and obese groups.

Association with self-reported eating disorders. Independent samples t-tests (Table 12) were used to compare the EDE-Q, IR-ED and IIP-32 scores of those participants who did and did not indicate they had an eating disorder diagnosis. Participants who reported an eating disorder scored significantly higher than participants who did not report an eating disorder on the EDE-Q, as would be expected. Those participants who indicated that they had recieved an eating disorder diagnosis scored significantly higher on all IR-ED subscales, but only on a subset of the IIP-32 scales. Effect sizes were higher for all of the IR-ED sub-scales than for the IIP-32, with approximately double the effect size for the mean overall score on the IR-ED relative to the IIP-32.

Table 8.

Pearson's correlations (*r*) between the IR-ED and the IIP-32) and the EDE-Q in non-clinical sample

	EDE-Q	
	Female (*n* = 364)	Male (*n* = 134)
IR-ED scales		
Food-related isolation	.572*	.456*
Avoidance of body evaluation	.683*	.497*
Food-related interpersonal tension	.426*	.327*
IIP-32 scales		
Mean Total	.499*	.282*
Hard to be sociable	.391*	.253*
Hard to be assertive	.264*	.066
Too aggressive	.270*	.217
Too open	-.111	-.028
Too caring	.384*	.266*
Hard to be supportive of others	.251*	.159
Hard to be involved with others	.339*	.191
Too dependent on others	.469*	.254*

* P <.001

Table 9.

Clinical validation of the IR-ED) and IIP-32 scales among the female and male non-clinical samples, using multiple regressions to determine which scales are associated with the EDE-Q.

	Overall effect			Significant individual predictors			
EDE-Q Sample	*F*	*P*	% variance explained	Independent variables	*t*	*P*	*Beta*
Female (*n = 364)*	38.4	.001	53.1%	IR-ED Food-Related Isolation	3.65	.001	.199
				IR-ED Avoidance of Body Evaluation	9.55	.001	.509
				IR-ED Food-Related Interpersonal Tension	1.99	.05	.088
				IIP Hard to be Sociable	2.13	.04	-.122
				IIP Too Caring	2.41	.02	.102
				IIP Too Dependent	3.37	.001	.176
Male (*n* = 134)	5.92	.001	28.9%	IR-ED Avoidance of Body Evaluation	2.89	.005	.338

Table 10.

Partial Pearson's correlations (*r*) between the IR-ED and the IIP-32 and EDE-Q. Controlling for PROMIS-A, PROMIS-D and the FNEB in non-clinical sample

	EDE-Q Total	
	Female (*N*=364)	Male (*N*=134)
IR-ED scales		
Food-related isolation	.426***	.364***
Avoidance of body evaluation	.528***	.388***
Food-related interpersonal tension	.328***	.261**
IIP-32 scales		
Mean Total	.156**	.179*
Hard to be social	.067	.137
Hard to be assertive	-.057	-.024
Too aggressive	.099	.166
Too open	.000	-.026
Too caring	.150**	.170
Hard to be supportive of others	.082	.090
Hard to be involved with others	.111*	.087
Too dependent on others	.150**	.172*

* P < .05; ** P < .01; *** P < .001.

Table 11.

Comparisons between Body Mass Index categories and scores on the IR-ED and IIP-32 sub-scales based on 515 participants who both completed the IR-ED, IIP-32 and gave their height and weight information.

	Underweight (UW)		Healthy Weight (HW)		Overweight (OW)		Obese (OB)		ANOVA		
	Mean	*(SD)*	Mean	*(SD)*	Mean	*(SD)*	Mean	*(SD)*	F	P	Tukey HSD
Interpersonal Relationships – Eating Disorders											
Food-Related Isolation	2.12	(1.27)	1.29	(0.64)	1.30	(0.64)	1.59	(.089)	13.07	.001	HW = OW < OB < UW
Avoidance of Body Evaluation	1.82	(0.94)	1.51	(0.78)	1.61	(0.91)	2.22	(1.10)	14.58	.001	HW = OW < OB
Food-Related Interpersonal Tension	2.02	(1.24)	1.38	(0.64)	1.31	(0.48)	1.54	(0.72)	9.39	.001	HW = OW < OB < UW
Inventory of Interpersonal Problems – 32											
Mean	1.92	(0.69)	1.87	(0.58)	1.81	(0.62)	1.99	(0.69)	1.57	*NS*	-
Hard to be Sociable	2.26	(1.19)	1.88	(0.95)	1.88	(1.01)	2.01	(1.07)	1.42	*NS*	-
Hard to be Assertive	2.27	(1.09)	2.22	(1.11)	1.98	(1.02)	2.04	(1.08)	1.86	*NS*	-
Too Aggressive	1.66	(0.70)	1.80	(0.78)	1.79	(0.82)	1.98	(0.90)	1.59	*NS*	-
Too Open	2.70	(0.82)	2.78	(0.77)	2.80	(0.74)	2.74	(0.76)	.21	*NS*	-
Too Caring	1.87	(0.94)	2.04	(0.83)	2.03	(0.84)	2.35	(0.94)	3.68	.01	HW = OW < OB
Hard to be Supportive	1.51	(0.83)	1.46	(0.76)	1.47	(0.80)	1.59	(0.83)	.62	*NS*	-
Hard to be Involved	1.85	(1.07)	1.67	(0.88)	1.57	(0.80)	1.86	(1.07)	2.09	*NS*	-
Too Dependent	1.98	(0.94)	2.07	(0.87)	1.86	(0.87)	2.10	(0.82)	2.19	*NS*	-

Table 12.

Comparisons between the IR-ED, IIP-32 and the EDE-) on participants with (*N*= 31) or without (*N*= 500) a disclosed history of eating disorder

	With reported eating disorder		Without reported eating disorder		t-test		
	Mean	(*SD)*	Mean	*(SD)*	*t*	*P*	*d*
IRED							
Food Related Isolation	2.34	(1.19)	1.32	(0.66)	7.83	.001	1.06
Avoidance of Body Evaluation	2.26	(0.87)	1.63	(0.90)	3.83	.001	0.71
Food-Related Interpersonal Tension	2.23	(1.14)	1.37	(0.61)	7.14	.001	0.94
Mean Effect Size							0.90
IIP-32							
Mean Total	2.29	(0.74)	1.85	(0.59)	3.91	.001	0.66
Hard to be sociable	2.45	(1.11)	1.89	(0.97)	3.12	.002	0.54
Hard to be assertive	2.76	(1.33)	2.09	(1.06)	3.35	.001	0.56
Too aggressive	1.86	(0.85)	1.81	(0.80)	0.31	*NS*	0.06
Too open	2.65	(0.88)	2.79	(0.76)	0.93	*NS*	0.17
Too caring	2.33	(0.99)	2.07	(0.86)	1.59	*NS*	0.28
Hard to be supportive of others	1.69	(1.05)	1.47	(0.77)	1.46	*NS*	0.24
Hard to be involved with others	2.40	(1.29)	1.65	(0.87)	4.50	.001	0.68
Too dependent on others	2.68	(0.98)	1.98	(0.84)	4.48	.001	0.77
Mean Effect Size							0.44
EDE-Q Global Score	3.25	(1.14)	1.78	(1.25)	6.36	.001	1.22

Discussion

Summary of Findings

The aim of this study was to develop a measure of interpersonal problems specific to eating pathology – the IR-ED. The aim was for such a measure to have a greater clinical utility for eating pathology than a commonly used generic interpersonal problems measure - the IIP-32. Following principal components analysis, a final 15-item version of the IR-ED emerged. The IR-ED contained three robust and reliable factors - Food-related Isolation; Avoidance of Body Evaluation; and Food-Related Interpersonal Tension. The IR-ED demonstrated concurrent validity with the IIP-32, and the two measures had comparable relationships to other areas of psychopathology (depression, anxiety and social anxiety). However, the IR-ED showed a superior relationship to eating pathology compared to the IIP-32, especially when controlling for other areas of psychopathology, suggesting greater clinical utility within eating disorder practice.

Further support for the use of the IR-ED was provided by supplementary analyses, which suggested that the IR-ED has a greater ability to distinguish between those who report a history of an eating disorder and those who do not. Additionally, unlike the IIP-32, the IR-ED was able to distinguish between those were and were not classified as being within the extremes of BMI. The results of this study support the hypotheses, showing that the IR-ED is a reliable, valid and specific tool for the measurement of interpersonal problems relating to eating pathology.

Interpersonal Problems in Eating Disorders

Previous clinical accounts have related interpersonal problems to eating pathology, especially interpersonal problems that relate to food, weight, shape and

body image (Fairburn, 2008). Several studies have indicated interpersonal problems that may be involved in the origin and maintenance of eating pathology, such as: non-assertiveness, submissiveness, social inhibition, being dependent on the opinions of others, being unable to express feelings to others, not understanding others' perspectives, a lower capacity to deal with strangers, and expressing distress (Arcelus, Haslam, Farrow, & Meyer, 2013; Carter, Kelly, & Norwood, 2012; Duchesne et al., 2012, Hartmann, Zeek, & Barrett, 2009; Hilbert et al., 2007; Lampard, Byrne, & McLean, 2012; Abraham & Beumont, 1982; Murphy, Straebler, Basden, Cooper, & Fairburn, 2012; Schmidt, & Treasure, 2006). However, those relationships have not been strong.

The IR-ED contains items that appear to correspond with more specific interpersonal problems that have previously been related to the onset and maintenance of eating pathology such as: a lack of intimacy, interpersonal role disputes, deceit, secrecy and isolating the self (Abraham & Beumont, 1982; Murphy, Straebler, Basden, Cooper, & Fairburn, 2012; Schmidt, & Treasure, 2006). This correspondence might explain the strong link between IR-ED and eating. Therefore, the IR-ED can be considered an advance in the ability to detect eating-specific interpersonal problems relative to more generic measures.

Specific interpersonal problems and eating pathology

Three sub-scales emerged from the IR-ED - Food-related isolation, Avoidance of body evaluation, and Food-related interpersonal tension. *Food-related isolation* captures a theme of not wanting to eat in front of others and the secrecy that can surround eating for people who experience eating pathology. Previous research has suggested shame and self-criticism are implicated in the maintenance cycle of eating disorders (Danakalis et al., 2016), impacting upon an individual's likelihood to isolate

themselves when eating and to disengage from social activities where eating may be likely. The Food-related isolation subscale may therefore be able to aid clinicians in detecting the impact of shame or isolation in clients. *Avoidance of body evaluation* appears to capture themes of social withdrawal, focusing on avoidance of activities or scenarios where others may view their body. Avoiding scenarios where body evaluation is possible is supported by Fairburn's (2008) hypothesis that concerns around weight, shape and body image may be central to the onset and maintenance of eating pathology. Concerns around how the body is evaluated could be hypothesised as being associated with restricted eating or purging behaviours, which aim to maintain shape, weight and body image closer to an idealised goal. *Food-related interpersonal tension* captures how an individual's eating behaviours influence how other people interact with and behave towards them. Previous research has suggested that people with eating disorders can isolate themselves and be involved in interpersonal role disputes (Murphy, Straebler, Basden, Cooper, & Fairburn, 2012), which appear to be related to this construct. The different emphases of the three sub-scales should allow clinicians greater insight into their client's experience, allowing the clinician to adapt interventions to target more problematic areas.

Further to the overall findings, it emerged that differences may exist between how genders experience interpersonal problems in relation to eating pathology. Females' eating pathology was associated with Food-related isolation, Avoidance of body evaluation and Food-related interpersonal tension. In contrast, among males the only significant predictor of eating pathology was Avoidance of body evaluation. It is unclear whether the observed gender differences represent a true difference in how males and females experience interpersonal problems with respect to eating pathology,

or if this difference represents how males and females complete the IR-ED. However, in either case, further research into gender differences in this area appears warranted.

The IR-ED was also able to discriminate between participants who reported healthy or overweight BMI from those who report underweight or obese BMI. Participants who reported underweight or obese BMI scored similarly on Food-related isolation and Food-related interpersonal tension when compared to healthy or overweight individuals. Additionally, obese individuals scored significantly higher than healthy or overweight participants on the Avoidance of Body Evaluation scale. Underweight participants showed a trend to score higher than healthy or overweight participants on the Avoidance of Body Evaluation subscale; however, this did not reach significance. These findings suggest that underweight and obese individuals may experience similar interpersonal problems related to their eating patterns, potentially influencing the maintenance of their different but unhealthy weight profiles. Further supporting evidence for this hypothesis emerges from Puhl and Heuer (2010) who suggest that obese individuals experience weight stigma which can have detrimental effects on psychological health, eating behaviours and can lead to a sense of shame. Lo Coco, Gullo, Scrima and Bruno (2012) also found distinct interpersonal profiles of obese individual's which were either characterised by imposing the self on others or feeling submissive to others. Both Puhl and Heuer (2010) and Lo Coco, Gullo, Scrima and Bruno (2012) were concerned with generic interpersonal problems meaning that further research into eating-specific interpersonal problems is warranted for obese individuals in light of these findings.

Limitations

While the outcomes of this study are supportive of the hypotheses, there are limitations to consider. The study sample was collected using online recruitment, which resulted in a large sample size. However, only a small proportion of the sample (<10%) were from outside the UK. The non-UK participants were from a wide ranging selection of countries. Future research will be needed in other countries and cultures to ensure that these findings are generalizable and that the measure is clinically useful in other settings and in translation.

The aim of this study was to collect data from a community sample, which was achieved using the current methodology. The 31 participants who endorsed a previous or current eating disorder diagnosis were excluded from the validation stage of the analysis, but were considered subsequently, with results suggesting that the measure was clinically useful at the diagnostic level. However, these 31 individuals lacked a formal diagnosis, and there were no details regarding potentially important clinical information (e.g., severity, duration, treatment history). Therefore, it is planned that the research team will follow up this study by using the IR-ED with a much larger, formally diagnosed sample.

In addition to eating disorder diagnoses, it is not known how different clinical groups (e.g., individuals who experience clinical anxiety or depression) would score on the IR-ED. Future research is therefore required to determine how people with other non-eating disorder psychiatric diagnoses score on the IR-ED. Due to the focus of the IR-ED on eating pathology, it would be expected that non-eating pathology groups would score significantly lower on the IR-ED, due to their psychological difficulties not being specific to eating behaviours.

Only female participants were used in the development of the IR-ED scales, to maintain the homogeneity of the sample. The IR-ED has therefore been constructed only using females' data, which might have influenced the observed gender differences in scores on the IR-ED subscales. Future research should obtain a larger sample of males to enable confirmatory factor analysis of the IR-ED subscales, and thus validate this factor structure for use in a male sample.

The age range of the sample was relatively small. The mean age for non-clinical females was 33.31 with a standard deviation of 11.38 compared to non-clinical males whose average age was 37.43 with a standard deviation of 13.57. These samples represent a relatively small range of ages meaning that age-appropriate norms have not been ascertained. Considering that many eating disorders are diagnosed in adolescence, further validation in this age range is required.

Berchtold (2016) suggests that Pearson's r, which has been used in this study, is the most commonly used measure of test-retest reliability. However, Weir (2005) has suggested that the use of Pearson's r alone is insufficient due to the statistic not accounting for systematic errors such as practice effects over time. Future research might incorporate alternative statistical measures of test-retest reliability, which look at both consistency of scores over time (within-participant variance) and changes in how each group score overall (systematic changes). Possible alternative measures of test-retest reliability could be variants of the Intraclass Correlation Coefficient, or alternatives to relative reliability scales such as Mean Error, Coefficient of Repeatability, or the Smallest Real Difference (Vaz, Falkmer, Passmore, Parsons, & Andreou, 2013).

Future research

Future research is required to further validate the IR-ED beyond the community sample obtained within the present study. The IR-ED has shown an ability to detect gender differences in eating-specific interpersonal problems. As the initial development of the IR-ED factor structure only involved female participants, it can be recommended that confirmatory factor analysis should be conducted on both male and female samples to further validate the IR-ED's factor structure. Research incorporating a male sample could also lead to gender-specific norms being developed for the IR-ED subscales, which could allow clinicians greater insight into how to plan their interventions with different clients.

The IR-ED was able to discriminate between a community sample and a small sub-sample of participants who endorsed some form of eating disorder. Future research should aim to validate the IR-ED using a sample of participants who have been diagnosed with specific eating disorders, such as Anorexia Nervosa, Bulimia Nervosa, Binge Eating Disorder or OSFED. Research using different diagnostic groups would allow insight into how people diagnosed with different forms of eating pathology experience interpersonal problems.

The age range of the sample collected for the current study was relatively small and therefore a larger, more age diverse sample would be recommended for future studies to enable age-appropriate norms to be constructed.

Participants who reported being obese score similarly on the IR-ED compared to those who report being underweight, and higher than those in other BMI categories. Future research should therefore investigate the role of interpersonal problems in relation to the onset and maintenance of obesity and overeating, with the aim of

improving prevention and intervention programmes for obese or bariatric clients, which is a growing health concern in England (The Health and Social Care Information Centre, 2016).

Future research could investigate different ways to measure the individual IR-ED items. This study used a 5-point Likert scale to balance clinical precision with ease of completion. A larger Likert or analogue scale might provide greater precision, but needs to be considered against the impact upon ease of completion. The IR-ED also asked about specific interpersonal problems over the course of twenty-eight days. This period of time has been used in the EDE-Q and is believed to represent a stable picture of someone's experience of eating related pathology. Using a shorter time period could assist individuals to report daily or weekly fluctuations or to track progress more immediately over time. Validation of different measurement systems would need to be conducted in order to answer how alternatives could contribute to how the IR-ED is used.

Clinical Implications

The results of this study indicate that the IR-ED is a useful tool for the measurement of eating-specific interpersonal problems. As such, several clinical implications arise from this study.

Fairburn, Cooper and Shafran (2003) have presented a transdiagnostic model of eating disorders, which notes the role of interpersonal problems in the onset and maintenance of eating disorders. The IR-ED's ability to measure eating-specific interpersonal problems may help to identify which interpersonal problems are the most salient to the transdiagnostic model, and therefore can help to direct clinical practice and research to focus on the most appropriate eating-specific interpersonal problems.

On an individual level, scores from individual IR-ED items or sub-scale totals might help clinicians to identify interpersonal problems that are specific to an individual's presentation. Being able to identify specific interpersonal problems can help clinicians to co-produce meaningful formulations with their clients and so help capture their experience in a way that helps to elicit which interpersonal problems might contribute to the maintenance of their difficulties.

Intervention packages could also be tailored or adapted to incorporate an individual's specific eating-related interpersonal difficulties. The adaptation of intervention packages to include interpersonal problems could be done either on an individual client basis, or research could investigate whether interventions focussing on interpersonal problems (e.g., interpersonal psychotherapy) are more effective for those who score highly on the IR-ED compared to standard intervention protocols.

Due to the IR-ED's stability over time, it would be useful as an outcome measure following intervention. The IR-ED could be used to track progress in improvements of interpersonal problems over the course of an intervention program. Additionally, the IR-ED could be used as a long-term outcome measure following therapy, which could be used as an indicator of potential relapse if scores begin to rise over time. Further validation of the IR-ED is required to determine its effectiveness as an outcome measure in a clinical eating disorder sample. However, results from this study suggest that this is possible.

In addition to individual usage, the IR-ED may be considered by those who wish to create prevention programs. Results suggest that underweight and obese individuals experience higher levels of eating specific interpersonal problems than healthy or overweight individuals. Education and prevention programs for adolescents that focus

on eating- and body-specific interpersonal problems might help to reduce the long-term impact of these experiences and so reduce perceived stigma and resultant psychopathology.

Conclusions

The IR-ED is a robust and valid measure of eating-specific interpersonal problems. Compared to more generic measures of interpersonal problems, the IR-ED provides greater insight into eating pathology specific interpersonal problems. Future research should aim to validate the IR-ED within a clinical sample and to investigate the roles of eating-specific interpersonal problems in the onset and ongoing maintenance of eating pathology.

References

Abraham, S. F., & Beumont, P. J. V. (1982). How patients describe bulimia or binge eating. *Psychological Medicine, 12,* 625-635. doi:10.1017/s0033291700055732

Arcelus, J., Haslam, M., Farrow, C., & Meyer, C. (2013). The role of interpersonal functioning in the maintenance of eating psychopathology: A systematic review and testable model. *Clinical Psychology Review, 33*, 156–167. doi:10.1016/j.cpr.2012.10.009

Barker, C. (2017). *Briefing Paper: Obesity Statistics.* London, UK: House of Commons.

Barkham, M., Hardy, G. E., & Startup, M. (1996). The IIP-32: A short version of the Inventory of Interpersonal Problems. *British Journal of Clinical Psychology, 35*, 21–35. doi:10.1111/j.2044-8260.1996.tb01159.x

Barrett, M. S., & Barber, J. P. (2007). Interpersonal profiles in major depressive disorder. *Journal of Clinical Psychology*, 63, 247–266. doi:10.1002/jclp.20346

Berchtold, A. (2016). Test-retest: Agreement or Reliability? *Methodological Innovations, 9,* 1-7. doi:10.1177/2059799116672875

Broberg, A. G., Hjalmers, I., & Nevonen, L. (2001). Eating disorders, attachment and interpersonal difficulties: a comparison between 18- to 24-year-old patients and normal controls. *European Eating Disorders Review*, *9*, 381–396. doi:10.1002/erv.421

Carter, J. C., Kelly, A. C., & Norwood, S. J. (2012). Interpersonal problems in anorexia nervosa: Social inhibition as defining and detrimental. *Personality and Individual Differences, 53,* 169–174. doi:10.1016/j.paid.2012.02.020

Collins, K. A., Westra, H. A., Dozois, D. J. A., & Stewart, S. H. (2005). The validity of the brief version of the Fear of Negative Evaluation Scale. *Journal of Anxiety Disorders, 19,* 345–359. doi:10.1016/j.janxdis.2004.02.003

Dancey, C. P., & Riedy, J. (2004) *Statistics without maths for psychology*, Harlow, UK: Pearson Education Limited.

Duchesne, M., Falcone, E. M. D., de Freitas, S. R., D'Augustin, J. F., Marinho, V., & Appolinario, J. C. (2012). Assessment of interpersonal skills in obese women with binge eating disorder. *Journal of Health Psychology, 17*, 1065–1075. doi:10.1177/1359105311432326

Danakalis, A., Clerici, M., Caslini, M., Favagrossa, L., Prunas, A., Volpato,., Riva, G., & Zanetti, M. A. (2016). Internalization of sociocultural standards of beauty and disordered eating behaviours: the role of body surveillance, shame and social anxiety. *Journal of Psychopathology, 20,* 33-37. doi:10.1016/j.comppsych.2016.01.

Eng, W., & Heimberg, R. G. (2006). Interpersonal correlates of generalized anxiety disorder: Self versus other perception. *Journal of Anxiety Disorders, 20*, 380–387. doi:10.1016/j.janxdis.2005.02.005

Fairburn, C. G. (2008). *Cognitive Behavior Therapy and Eating Disorders*. New York, NY: Guilford Press.

Fairburn. C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self report questionnaire? *International Journal of Eating Disorders, 16,* 363-37. doi:10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.Co;2-#

Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: A "transdiagnostic" theory and treatment. *Behaviour Research and Therapy, 41,* 509-528. doi:10.1016/S0005-7967(02)00088-8

Gorsuch, R. L. (1983). *Factor analysis*. Hillsdale, NJ: Lawrence Erlbaum

Grisham, J. R., Steketee, G., & Frost, R. O. (2008). Interpersonal problems and emotional intelligence in compulsive hoarding. *Depression and Anxiety, 25*, E63–E71. doi:10.1002/da.20327

Hartmann, A., Zeeck, A., & Barrett, M. S. (2009). Interpersonal problems in eating disorders. *International Journal of Eating Disorders, 43*, 619–627. doi:10.1002/eat.20747

Hilbert, A., Saelens, B. E., Stein, R. I., Mockus, D. S., Welch, R. R., Matt, G. E., & Wilfley, D. E. (2007). Pretreatment and process predictors of outcome in interpersonal and cognitive behavioral psychotherapy for binge eating disorder. *Journal of Consulting and Clinical Psychology, 75,* 645–651. doi:10.1037/0022-006x.75.4.645

Kleiner, L.., & Marshall, W. L. (1987). The role of interpersonal problems in the development of agoraphobia with panic attacks. *Journal of Anxiety Disorders, 1*, 313–323. doi:10.1016/0887-6185(87)90011-9

Lampard, A. M., Byrne, S. M., & McLean, N. (2011). Does Self-esteem mediate the relationship between interpersonal problems and symptoms of disordered eating? *European Eating Disorders Review, 19,* 454-458. doi:10.1002/erv.1120

Lazarus, S. A., Cheavens, J. S., Festa, F., & Rosenthal, Z. M. (2014). Interpersonal functioning in borderline personality disorder: A systematic review of behavioural and laboratory-based assessments. *Clinical Psychology Review, 34*, 193–205. doi:10.1016/j.cpr.2014.01.007

Leary, M. R. (1983). A brief version of the fear of negative evaluation scale. *Personality and Social Psychology Bulletin, 9,* 371-375. doi:10.1177/0146167283093007

Lieberman, M., Gauvin, L., Bukowski, W. M., & White, D. R. (2001). Interpersonal influence and disordered eating behaviors in adolescent girls. *Eating Behaviors, 2*, 215–236. doi:10.1016/s1471-0153(01)00030-7

Lo Coco, G., Gullo, S., Scrima, F., & Bruno. V. (2012). Obesity and interpersonal problems: An analysis with the interpersonal circumplex. *Clinical Psychology and Psychotherapy, 19,* 390-398. doi:10.1002/cpp.753

Luce, K. H., & Crowther, J. H. (1999). The reliability of the eating disorder examination – self-report questionnaire version (EDE-Q). *International Journal of Eating Disorders, 25,* 349-351. doi:10.1037/0022-3514.89.4.623

McEvoy, P. M., Burgess, M. M., Page, A. C., Nathan, P., & Fursland, A. (2013). Interpersonal problems across anxiety, depression, and eating disorders: A transdiagnostic examination. *British Journal of Clinical Psychology, 52,* 129–147. doi:10.1111/bjc.12005

Murphy, R., Straebler, S., Basden, S., Cooper, Z., & Fairburn, C. G. (2012). Interpersonal Psychotherapy for eating disorders. *Clinical Psychology and Psychotherapy, 19,* 150–158. doi:10.1002/cpp.1780

NHS Choices. (2016). *What is the body mass index (BMI)?* Retrieved from http://www.nhs.uk/chq/Pages/3215.aspx?CategoryID=52

O'Rourke, N., & Hatcher, L. (2013). *A step-by-step approach for using SAS for factor analysis and structural equation modelling second edition.* Cary, NC: SAS Institute Inc.

Qualtrics. (2016). http://*www.qualtrics.com*, Utah, UT: Qualtrics.

Pilkonis, P. A., Choi, S. W., Reise, S. P., Stover, A. M., Riley, W. T., & Cella, D. (2011). Item banks for measuring emotional distress from the patient-reported outcomes measurement information system (PROMIS): Depression, anxiety, and anger. *Assessment, 18*, 261-283. doi: 10.1177/1073191111411667

Puhl, R. M., & Heuer, C. A. (2010). Obesity stigma: Important considerations for public health. *American Journal of Public Health, 100,* 1019-1028. doi:10.2105/AJPH.2009.159491

Rieger, E., Van Buren, D. J., Bishop, M., Tanofsky-Kraff, M., Welch, R., & Wilfley, D. E. (2010). An eating disorder-specific model of interpersonal psychotherapy (IPT-ED): Causal pathways and treatment implications. *Clinical Psychology Review, 30,* 400–410. doi:10.1016/j.cpr.2010.02.001

Schmidt, U., & Treasure, J. (2006). Anorexia nervosa: Valued and visible. A cognitive-interpersonal maintenance model and its implications for research and practice. *British Journal of Clinical Psychology, 45*, 343–366. doi:10.1348/014466505x53902

Streiner, D. L. (2003). Starting at the beginning: An introduction to coefficient alpha and internal consistency. *Journal of Personality Assessment, 80,* 99-103, doi:10.1207/S15327752JPA8001_18

Tang, T. N., Toner, B. B., Stuckless, N., Dion, K. L., Kaplan, A. S., & Ali, A. (1998). Features of eating disorders in patients with irritable bowel syndrome. *Journal of Psychosomatic Research, 45*, 171–178. doi:10.1016/s0022-3999(97)00300-0

Tankofsky-Kraff, M., Wilfrey, D. E., & Spurrell, E. (2000). Impact of interpersonal and ego-related stress on restrained eaters. *International Journal of Eating Disorders, 27,* 411-418, doi:10.1002/(SICI)1098-108X(200005)27:4<411::AID-EAT5>3.0.CO;2-P

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2,* 53-55. doi:10.5116/ijme.4dfb.8dfd

The Health and Social Care Information Centre. (2016). *Statistics on obesity, physical activity and diet: England, 2016.* Retrieved from https://www.gov.uk/government/statistics/statistics-on-obesity-physical-activity-and-diet-england-2016

Vaz, S., Falkmer, T., Passmore, A. E., Parsons, R., Andreou, P. (2013). The case for using the repeatability coefficient when calculating test-retest reliability. *PLoS ONE, 8,* e73990. doi:10.1371/journal.pone.0073990

Weir, J. P. (2005). Quantifying test-retest reliability using the intraclass correlation coefficient and the SEM. *Journal of Strength and Conditioning Research, 19,* 231-240. doi: 10.1519/00124278-200502000-00038

Section 3

Appendices

Appendix A

Psychotherapy outcome study methodology rating form3

Note: If not enough information is given regarding a specific item a rating of 0 is given.

1. Clarity of sample description

0 Poor. Vague description of sample (e.g. only mentioned whether patients were diagnosed with the disorder).

1 Fair. Fair description of sample (e.g. mentioned inclusion/exclusion criteria, demographics, etc.).

2 Good. Good description of sample (e.g. mentioned inclusion/exclusion criteria, demographics, and the prevalence of comorbid disorders).

2. Severity/chronicity of the disorder

0 Poor. Severity/chronicity was not reported and/or subsyndromal patients were included in the sample.

1 Fair. All patients met the criteria for the disorder. Sample includes acute (o1 yr) and/or low severity.

2 Good. Sample consisted entirely of chronic (41 yr) patients of at least moderate severity.

3. Representativeness of the sample

0 Poor. Sample is very different from patients seeking treatment for the disorder (e.g. there are excessively strict exclusion criteria).

1 Fair. Sample is somewhat representative of patients seeking treatment for the disorder (e.g. patients were only excluded if they met criteria for other major disorders).

2 Good. Sample is very representative of patients seeking treatment for the disorder (e.g. authors made efforts to ensure representativeness of sample).

4. Reliability of the diagnosis in question

0 Poor. The diagnostic process was not reported, or not assessed with structured interviews by a trained interviewer.

1 Fair. The diagnosis was assessed with structured interview by a trained interviewer.

2 Good. The diagnosis was assessed with structured interview by a trained interviewer and adequate inter-rater reliability was demonstrated (e.g. kappa coefficient).

5. Specificity of outcome measures

0 Poor. Very broad outcome measures, not specific to the disorder (e.g. SCL-90R total score).

1 Fair. Moderately specific outcome measures.

2 Good. Specific outcome measures, such as a measure for each symptom cluster.

6. Reliability and validity of outcome measures

0 Poor. Measures have unknown psychometric properties, or properties that fail to meet current standards of acceptability.

1 Fair. Some, but not all measures have known or adequate psychometric properties.

2 Good. All measures have good psychometric properties. The outcome measures are the best available for the authors' purpose.

7. Use of blind evaluators

0 Poor. Blind assessor was not used (e.g. assessor was the therapist, assessor was not blind to treatment condition, or the authors do not specify).

1 Fair. Blind assessor was used, but no checks were used to assess the blind.

2 Good. Blind assessor was used in correct fashion. Checks were used to assess whether the assessor was aware of treatment condition.

8. Assessor training

0 Poor. Assessor training and accuracy are not specified, or are unacceptable.

1 Fair. Minimum criterion for assessor training is specified (e.g. assessor has had specific training in the use of the outcome measure), but accuracy is not monitored or reported.

2 Good. Minimum criterion of assessor training is specified. Inter-rater reliability was checked, and/or assessment procedures were calibrated during the study to prevent evaluator drift.

9. Assignment to treatment

0 Poor. Biased assignment, e.g. patients selected their own therapy or were assigned in another non-random fashion, or there is only one group.

1 Fair. Random or stratified assignment. There may be some systematic bias but not enough to pose a serious threat to internal validity. There may be therapist by treatment confounds. N may be too small to protect against bias.

2 Good. Random or stratified assignment, and patients are randomly assigned to therapists within condition. When theoretically different treatments are used, each treatment is provided by a large enough number of different therapists. N is large enough to protect against bias.

10. Design

0 Poor. Active treatment vs. WLC, or briefly described TAU.

1 Fair. Active treatment vs. TAU with good description, or placebo condition.

2 Good. Active treatment vs. another previously empirically documented active treatment.

11. Power analysis

0 Poor. No power analysis was made prior to the initiation of the study.

1 Fair. A power analysis based on an estimated effect size was used.

2 Good. A data-informed power analysis was made and the sample size was decided accordingly.

12. Assessment points

0 Poor. Only pre- and post-treatment, or pre- and follow-up.

1 Fair. Pre-, post-, and follow-up o1 year.

2 Good. Pre-, post-, and follow-up X1 year.

13. Manualized, replicable, specific treatment programs

0 Poor. Description of treatment procedure is unclear, and treatment is not based on a publicly available, detailed treatment manual. Patients may be receiving multiple forms of treatment at once in an uncontrolled manner.

1 Fair. Treatment is not designed for the disorder, or description of the treatment is generally clear and based on a publicly available, detailed treatment manual, but there are some ambiguities about the procedure. Patients may have received additional forms of treatment, but this is balanced between groups or otherwise controlled.

2 Good. Treatment is designed for the disorder. A detailed treatment manual is available, and/or treatment is explained in sufficient detail for replication. No ambiguities about the treatment procedure. Patients receive only the treatment in question.

14. Number of therapists

0 Poor. Only one therapist, i.e. complete confounding between therapy and therapist.

1 Fair. At least two therapists, but the effect of therapist on outcome is not analyzed.

2 Good. Three, or more therapists, and the effect of therapist on outcome is analyzed.

15. Therapist training/experience

0 Poor. Very limited clinical experience of the treatment and/or disorder (e.g. students).

1 Fair. Some clinical experience of the treatment and/or disorder.

2 Good. Long clinical experience of the treatment and the disorder (e.g. practicing therapists).

16. Checks for treatment adherence

0 Poor. No checks were made to assure that the intervention was consistent with protocol.

1 Fair. Some checks were made (e.g. assessed a proportion of therapy tapes).

2 Good. Frequent checks were made (e.g. weekly supervision of each session using a detailed rating form).

17. Checks for therapist competence

0 Poor. No checks were made to assure that the intervention was delivered competently.

1 Fair. Some checks were made (e.g. assessed a proportion of therapy tapes).

2 Good. Frequent checks were made (e.g. weekly supervision of each session using a detailed rating form).

18. Control of concomitant treatments (e.g. medications)

0 Poor. No attempt to control for concomitant treatments, or no information about concomitant treatments provided. Patients may have been receiving other forms of treatment in addition to the study treatment.

1 Fair. Asked patients to keep medications stable and/or to discontinue other psychological therapies during the treatment.

2 Good. Ensured that patients did not receive any other treatments (medical or psychological) during the study.

19. Handling of attrition

0 Poor. Proportions of attrition are not described, or described but no dropout analysis is performed.

1 Fair. Proportions of attrition are described, and dropout analysis or intent-to-treat analysis is performed.

2 Good. No attrition, or proportions of attrition are described, dropout analysis is performed, and results are presented as intent-to-treat analysis.

20. Statistical analyses and presentation of results

0 Poor. Inadequate statistical methods are used and/or data are not fully presented.

1 Fair. Adequate statistical methods are used but data are not fully presented.

2 Good. Adequate statistical methods are used and data are presented with M and SD.

21. Clinical significance

0 Poor. No presentation of clinical significance was done.

1 Fair. An arbitrary criterion for clinical significance was used and the conditions were compared regarding percent clinically improved.

2 Good. Jacobson's criteria for clinical significance were used and presented for a selection (or all) of the outcome measures, and conditions were compared regarding percent clinically improved.

22. Equality of therapy hours (for non-WLC designs only)

0 Poor. Conditions differ markedly (>20% difference in therapy hours).

1 Fair. Conditions differ somewhat (10–19% difference in therapy hours).

2 Good. Conditions do not differ (<10% difference in therapy hours)

Appendix B

Ethical Approval Letter

Downloaded: 30/04/2016
Approved: 29/04/2016

Glenn Waller
Psychology

Dear Glenn

PROJECT TITLE: The Development of a Questionnaire to Measure Interpersonal Problems Specific to Eating Concerns
APPLICATION: Reference Number 007874

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 29/04/2016 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 007874 (dated 24/02/2016).
- Participant information sheet 1015791 version 1 (24/02/2016).
- Participant consent form 1015792 version 1 (24/02/2016).

The following optional amendments were suggested:

The information sheet states that email addresses cannot be linked to responses. However, how can test-retest reliability be tested if responses aren't linked? Similarly, how can data be deleted if participants subsequently withdraw if emails can't be linked to responses? This needs to be clarified and the information sheet amended accordingly. Up until what point can ppts withdraw? This needs to be clarified and the information sheet amended accordingly. The debrief lists university eating disorder service as a source of support, but this won't be appropriate for ppts recruited via social media/snowballing. The debrief needs to be amended accordingly.

If during the course of the project you need to deviate significantly from the above-approved documentation please inform me since written approval will be required.

Yours sincerely

Thomas Webb
Ethics Administrator
Psychology

Appendix C

Study Information Sheet

Participant Information Sheet

Department Of Psychology.
Clinical Psychology Unit.

Doctor of Clinical Psychology (DClin Psy) Programme
Clinical supervision training and NHS research training & consultancy.

Clinical Psychology Unit
Department of Psychology
University of Sheffield
Western Bank
Sheffield S10 2TN UK

Participant Information Sheet

Title of Project: ***The Development of a measure of interpersonal relationships related to eating behaviours***

Name of Researchers: Steve Jones, Prof Glenn Waller

Thank you for taking time to read this. We are inviting you to take part in a research study aiming to construct a measure of interpersonal relationships related to eating behaviours.

Before you decide whether you would like to take part it is important you understand the purpose of the research and what your participation would involve. Please take time to read the following information carefully before deciding whether or not you wish to take part. Please contact us if you have any questions or would like more information.

What is the purpose of the study?

The purpose of this study is to construct a questionnaire which helps to measure interpersonal relationships which could influence eating behaviours.

Who is taking part?

Almost anyone is able to take part in this research. The only reason you would not be able to take part is if you have had a diagnosis of an eating disorder.

Do I have to take part?

Your participation in this research is completely voluntary. If you choose to participate you are free to withdraw at any point without giving a reason, and any data collected will be destroyed.

What will happen to me if I take part?

If you choose to take part in this study you will be asked to give your informed consent. In order to do this we ask that you fully read this information sheet and the upcoming consent form. If after reading this information you are happy to proceed we ask that you enter your email address. You will then be asked to complete 6 questionnaires online. We ask you to be as honest within these questionnaires as you are able to be. The 6 questionnaires shouldn't take longer than 10-15 minutes to complete.

Two weeks after completing the first round of questionnaires I will contact you again via the email address that you have provided to complete one of the questionnaires again. This should take no longer than 5 minutes. We cannot link your responses to your email address and therefore we are able to keep your information and responses anonymous.

What are the possible benefits of this research?

There may be no direct benefit to you as an individual in taking part in this research. You may gain some awareness of your own eating behaviour and thoughts you have associated with eating and your interpersonal relationships; however no direct benefit is expected.

The aim of the study is to help to develop a measure which can detect interpersonal factors associated with eating behaviour to enable greater insight for psychological therapies.

Are there possible risks of taking part in this research?

You will be asked questions about your eating habits and your interpersonal relationships. There is potential that you may find this uncomfortable. If at any point during the study you feel that you no longer wish to participate, then you are free to withdraw your consent and cease participation.

Will I be recorded, and if so how will the recorded media be used?

The experiment will not be audio recorded using digital media. Your responses will be recorded electronically using a software package. This software allows us to collect your data without linking it to your email address and therefore ensures that your data remains anonymous.

What if I change my mind?

You are free to withdraw your consent to take part in this research at any time without giving your reasons. Any data collected will be destroyed.

What happens if something goes wrong?

If you have any concerns about this research, please contact the researcher who will do their best to answer your questions. If they are unable to respond in an acceptable way or if you wish to make a complaint please contact the project supervisor, Professor Glenn

Waller, on 0114-222-6568. If you have any further concerns, please contact the University of Sheffield's Office of the Registrar and Secretary at 0114 222 1101.

Will my participation in this research be kept confidential?

All personal information collected about you during this research will remain confidential. Your email will be stored separately in a password protected Microsoft excel file, and destroyed on completion of the research. The Research Supervisor will have access to the data, but all personal identifiers will have been removed. Your name will not be used for analysis or in writing up and you will not be identifiable.

What will happen to the results of the research?

It is the intention of the researchers to publish the results of the research in a scientific, peer reviewed journal. If you would like a summary of the results please let us know.

Who should I contact if I have a question or need more information?

Steve Jones
Clinical Psychology Unit
Department of Psychology
University of Sheffield
Western Bank
Sheffield
S10 2TN

Email: sjones10@sheffield.ac.uk

This proposal has been reviewed and approved by the Department of Psychology, University of Sheffield Ethics Committee. The University's Research Ethics Committee monitors the application and delivery of the University's Review Procedure across the University.

Thank you for agreeing to take part in this research

Appendix D

Informed Consent

Department Of Psychology.
Clinical Psychology Unit.

Doctor of Clinical Psychology (DClin Psy) Programme
Clinical supervision training and NHS research training & consultancy.

Clinical Psychology Unit
Department of Psychology
University of Sheffield
Western Bank
Sheffield S10 2TN UK

Title of Project: ***The Development of a measure of interpersonal difficulties related to eating behaviours***
Name of Researchers: Steve Jones, Prof. Glenn Waller

Please select each box

1. I confirm that I have read and understand the information sheet dated …….. explaining the above research project and I have had the opportunity to ask questions about the project. ☐

2. I understand that my participation is voluntary and that I am free to Withdraw at any time without giving any reason and without there being any negative consequences. In addition, should I not wish to answer any particular question or questions, I am free to decline. ☐

3. I understand that my responses will be kept strictly confidential. I give permission for members of the research team to have access to my anonymised responses. I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in thereport or reports that result from the research. ☐

4. I agree for the data collected from me to be used in future research ☐

5. I agree to take part in the above research project. ☐

To provide informed consent to participate in this study please enter your email address in the box below. Please note you will not be able to access the study without providing your email address.

Appendix E

Debrief Sheet

Department of Psychology.
Clinical Psychology Unit.

Doctor of Clinical Psychology (DClin Psy) Programme
Clinical supervision training and NHS research training & consultancy.

Clinical Psychology Unit
Department of Psychology
University of Sheffield
Western Bank
Sheffield S10 2TN UK

Title of Project: ***The Development of a measure of interpersonal difficulties related to eating behaviours***

Name of Researchers: Steve Jones, Prof. Glenn Waller

Participant Debrief

Thank you for taking part in this study. The aim of this study is to develop a measure which can identify interpersonal problems related to eating disorders.

Research suggests that interpersonal problems or difficulties can be maintaining factors in eating disorders. It is therefore important for therapists to understand which interpersonal problems are currently problematic for an individual with an eating disorder. Knowing which interpersonal problems are affecting someone can help to make psychological therapy more targeted to the individual and therefore more effective.

You have been asked to complete a total of 6 psychological questionnaires. You have been asked to complete the measure that we are trying to develop. Collecting responses to this measure can help us to understand if it is measuring what we want it to.

We have also asked you to complete a measure of eating related behaviour and thoughts. This measure is used to see if our new questionnaire is related to eating behaviours and thoughts as we are looking to understand how our new measure predicts, and is related to, eating behaviours and thoughts.

You will also have completed a currently used measure of interpersonal problems. The aim of this measure was to see if our new measure was better at predicting eating behaviour than the one which is currently widely used.

If any concerns have been raised in relation to your health or eating, then we advise you to contact your GP for advice. Alternatively you may wish to contact the University Eating Disorder Counselling Service or seek information which can be found by accessing the following website: https://www.sheffield.ac.uk/health/services/eatingdisorders

If this study has caused you any concerns, or you are unsure as to the reason behind this study then please feel free to contact the researcher on the contact details below.

Steve Jones
Email: sjones10@sheffield.ac.uk

Appendix F

Email Advert

Subject Line: The Development of a measure of interpersonal relationships related to eating behaviours – Participants needed!

Dear Sir / Madam,

My name is Stephen Jones and I am a Trainee Clinical Psychologist at the University of Sheffield. I am currently undertaking research aiming to construct a questionnaire to measure how eating behaviours are influenced by interpersonal relationships.

In order to fully develop the measure we require people to complete a series of 6 questionnaires. These questionnaires will look at your interpersonal relationships and your eating behaviours.

The study can be accessed via the link embedded within this email. When you access the link you will be shown an information sheet about the study and will be asked to give your informed consent. In order to consent for this study we will require you to enter your email address. You will then be guided through the questionnaires before being shown a debrief sheet with a reminder about the studies aims.

Following the completion of this round of questionnaires we would also like to contact you via the email address that you provide. We would aim to contact you 2 weeks after you have completed the questionnaires and ask you to complete one of the questionnaires again.

All participation in this study is completely voluntary and you are able to withdraw your consent at any time. Nor, if you do not wish do you have to answer any specific questions. All data collected within this study will be kept anonymous and confidential.

If you wish to participate within this study then please follow this link: ***Link***

If you have any further questions or queries about this research please feel free to contact the researcher via email: sjones10@sheffield.ac.uk

Kind Regards,

Stephen Jones
Trainee Clinical Psychologist

Prof Glenn Waller
Research Supervisor

Appendix G

Facebook Advert

Interested in taking part in psychological research?

This short questionnaire study could help to further our understanding of interpersonal relationships and how they influence eating behaviours. If you are interested in taking part please follow this link: **link**

Further information is provided on the information sheet and consent form that can be found along the above link. Participation is voluntary and you are free to withdraw at any point.

This project is being completed as a part of my clinical doctorate in psychology and forms a part of my research thesis.

If you have any queries or questions about the research please feel free to contact my on sjones10@sheffield.ac.uk.

Thank you for reading!

Stephen Jones
Trainee Clinical Psychologist

Prof Glenn Waller
Research Supervisor

Appendix H

Twitter Advert

Max 140 characters:

“Research into a measure of interpersonal relationships in eating behaviour. Follow link to participate: [**link can be this long xxxxxxxxxxx**]”

The link at the end of this advert will take the potential participant through to the online experiment and the information sheet.

Appendix I

Study Completers Location Table

Location	*N*
England	481
USA	14
Australia	5
Scotland	4
Germany	3
Spain	3
Republic of Ireland	2
New Zealand	2
Switzerland	2
United Arab Emirates	2
Albania	1
Greece	1
Iraq	1
Israel	1
Luxembourg	1
Netherlands	1
Philippines	1
Portugal	1
Russia	1
Saudi Arabia	1
South Africa	1
Thailand	1
Wales	1

Appendix J

Interpersonal Relationships – Eating Disorders – 26 item version

Instructions: Thinking about your experiences with others over the past 28 days, how much would you say that the following statements applied to you?

	Not at all	A little bit	Moderately	Quite a bit	All the time
I find it hard to spend time with others because I worry what they think about my body	☐	☐	☐	☐	☐
I worry what others would think of my if they knew how I eat	☐	☐	☐	☐	☐
I avoid social situations where eating is involved	☐	☐	☐	☐	☐
My appearance allows me to stand out amongst my peers	☐	☐	☐	☐	☐
I avoid getting into conversations with others about food	☐	☐	☐	☐	☐
I avoid socialising with people who are likely to comment on my body or appearance	☐	☐	☐	☐	☐
Eating the way I do helps me to cope with my anxiety in social situations	☐	☐	☐	☐	☐
Other people try to pressure me into eating differently	☐	☐	☐	☐	☐
I avoid intimacy because I worry what others will think of my body	☐	☐	☐	☐	☐
Others admire my ability to control what I eat	☐	☐	☐	☐	☐
I avoid certain activities that would mean other people might judge my body	☐	☐	☐	☐	☐
My pattern of eating often leads to disagreements or tension with others	☐	☐	☐	☐	☐
My appearance helps me feel that I fit in and am more accepted by others	☐	☐	☐	☐	☐

Other people try to pressure me into changing my appearance	☐	☐	☐	☐	☐
My eating patterns make it hard for me to socialise as much as I would like to	☐	☐	☐	☐	☐
Other people worry about what I eat	☐	☐	☐	☐	☐
When I experience tension with others, I focus more on controlling my eating / weight	☐	☐	☐	☐	☐
I prefer to eat alone to avoid conflict with others about what I eat	☐	☐	☐	☐	☐
I worry that I spend too much time taking with other people about my appearance	☐	☐	☐	☐	☐
Controlling my weight helps me to feel more confident in social situations	☐	☐	☐	☐	☐
Worrying about my weight and appearance makes it difficult to feel really “connected” when I am with other people	☐	☐	☐	☐	☐
My eating patterns cause me to withdraw from others	☐	☐	☐	☐	☐
Eating the way I do makes it more likely that others will show concern for me	☐	☐	☐	☐	☐
It is difficult to meet new people as I worry they are judging me or my appearance	☐	☐	☐	☐	☐
My eating patterns cause me to secretive or deceptive with others	☐	☐	☐	☐	☐
Eating the way I do helps me to communicate my feelings and needs to others	☐	☐	☐	☐	☐

Appendix K

Inventory of Interpersonal Problems-32

IIP-32 Question/ Scoring Sheet

Name: _____

Date: ____ / ____ / ____ (Month / Day / Year) Sex: Male ☐ Female ☐

People have reported having the following problems in relating to other people. Please read the list below, and for each item, consider whether it has been a problem for you with respect to **any** significant person in your life. Then fill in the numbered circle that describes how distressing that problem has been.

The following are things you find hard to do with other people. **It is hard for me to:**	Not at all	A little bit	Moderately	Quite a bit	Extremely	
1. Say "no" to other people	⓪	①	②	③	④	1.
2. Join in on groups	⓪	①	②	③	④	2.
3. Keep things private from other people	⓪	①	②	③	④	3.
4. Tell a person to stop bothering me	⓪	①	②	③	④	4.
5. Introduce myself to new people	⓪	①	②	③	④	5.
6. Confront people with problems that come up	⓪	①	②	③	④	6.
7. Be assertive with another person	⓪	①	②	③	④	7.
8. Let other people know when I am angry	⓪	①	②	③	④	8.
9. Socialize with other people	⓪	①	②	③	④	9.
10. Show affection to people	⓪	①	②	③	④	10.
11. Get along with people	⓪	①	②	③	④	11.
12. Be firm when I need to be	⓪	①	②	③	④	12.
13. Experience a feeling of love for another person	⓪	①	②	③	④	13.
14. Be supportive of another person's goals in life	⓪	①	②	③	④	14.
15. Feel close to other people	⓪	①	②	③	④	15.
16. Really care about other people's problems	⓪	①	②	③	④	16.
17. Put somebody else's needs before my own	⓪	①	②	③	④	17.
18. Feel good about another person's happiness	⓪	①	②	③	④	18.
19. Ask other people to get together socially with me	⓪	①	②	③	④	19.
20. Be assertive without worrying about hurting the other person's feelings	⓪	①	②	③	④	20.
The following are things that you do too much.						
21. I open up to people too much.	⓪	①	②	③	④	21.
22. I am too aggressive toward other people.	⓪	①	②	③	④	22.
23. I try to please other people too much.	⓪	①	②	③	④	23.
24. I want to be noticed too much.	⓪	①	②	③	④	24.
25. I try to control other people too much.	⓪	①	②	③	④	25.
26. I put other people's needs before my own too much.	⓪	①	②	③	④	26.
27. I am overly generous to other people.	⓪	①	②	③	④	27.
28. I manipulate other people too much to get what I want.	⓪	①	②	③	④	28.
29. I tell personal things to other people too much.	⓪	①	②	③	④	29.
30. I argue with other people too much.	⓪	①	②	③	④	30.
31. I let other people take advantage of me too much.	⓪	①	②	③	④	31.
32. I am affected by another person's misery too much.	⓪	①	②	③	④	32.

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Appendix L

Eating Disorder Examination – Questionnaire

Instructions
The following questions are concerned with the past four weeks (28 days) only. Please read each question carefully. Please answer all the questions. Thank you.
Questions 1 to 12. Please circle the appropriate number on the right. Remember that the questions refer to the past four weeks (28 days) only.

ON HOW MANY OF THE PAST 28 DAYS …….		No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1	Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight?	0	1	2	3	4	5	6
2.	Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
3.	Have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
4.	Have you tried to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
5.	Have you had a definite desire to have an empty stomach with the aim of influencing your shape or weight?	0	1	2	3	4	5	6
6.	Have you had a definite desire to have a totally flat stomach?	0	1	2	3	4	5	6
7.	Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
8.	Has thinking about shape or weight made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6

9.	Have you had a definite fear of losing control over eating?	0	1	2	3	4	5	6
10.	Have you had a definite fear that you might gain weight?	0	1	2	3	4	5	6
11.	Have you felt fat?	0	1	2	3	4	5	6
12.	Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

Questions 13-18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past four weeks (28 days) ……

13.	Over the past 28 days, how many <u>times</u> have you eaten what other people would regard as an <u>unusually large amount of food</u> (given the circumstances)? ……
14.	……On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)? ……
15.	Over the past 28 days, on how many **<u>DAYS</u>** have such episodes of overeating occurred (i.e., you have eaten an unusually large amount of food <u>and</u> have had a sense of loss of control at the time)? ……
16.	Over the past 28 days, how many <u>times</u> have you made yourself sick (vomit) as a means of controlling your shape or weight? ……
17.	Over the past 28 days, how many <u>times</u> have you taken laxatives as a means of controlling your shape or weight? ……
18.	Over the past 28 days, how many <u>times</u> have you exercised in a “driven” or “compulsive” way as a means of controlling your weight, shape or amount of fat, or to burn off calories? ……

Questions 19-21: Please circle the appropriate number. <u>Please note that for these questions the term "binge eating" means</u> eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

19.	Over the past 28 days, on how many days have you eaten in secret (i.e., furtively)? ……Do not count episodes of binge eating	No days 0	1-5 days 1	6- 12 days 2	13-15 days 3	16-22 days 4	23-27 days 5	Everyday 6
20.	On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? ……Do not count episodes of binge eating	None of the times 0	A few of the times 1	Less then half 2	Half of the times 3	More than half 4	Most of the time 5	Every time 6
21.	Over the past 28 days, how concerned have you been about other people seeing you eat? ..... Do not count episodes of binge eating	Not at all 0	Slightly 1	 2	Moderately 3	 4	Markedly 5	 6

Questions 22 to 28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks 28 days)

Over the past 28 days ……		NOT AT ALL		SLIGHTLTY		MODERATELY		MARKEDLY
22.	Has your <u>weight</u> influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23.	Has your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24.	How much would it upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	0	1	2	3	4	5	6
25.	How dissatisfied have you felt about your <u>weight</u>?	0	1	2	3	4	5	6
26.	How dissatisfied have you felt about your <u>shape</u>?	0	1	2	3	4	5	6
27.	How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	0	1	2	3	4	5	6
28.	How uncomfortable have you felt about <u>others</u> seeing your shape or figure (for example. In communal changing rooms, when swimming, or wearing tight clothes)?	0	1	2	3	4	5	6

What is your weight at present? (Please give your best estimate) …….

What is your height? (Please give your best estimate) ……

If female: Over the past three-to-four months have you missed any menstrual periods? ……

If so, how many? ……

Have you been taking the "pill"? ……

THANK YOU

Appendix M

Fear of Negative Evaluation – Brief

	Not at all characteristic of me	Slightly characteristic of me	Moderately characteristic of me	Very characteristic of me	Extremely characteristic of me
I worry about what other people will think of me even when I know it doesn't make any difference.	☐	☐	☐	☐	☐
I am unconcerned even if I know people are forming an unfavourable impression of me.	☐	☐	☐	☐	☐
I am frequently afraid of other people noticing my shortcomings.	☐	☐	☐	☐	☐
I rarely worry about what kind of impression I am making on someone.	☐	☐	☐	☐	☐
I am afraid that others will not approve of me.	☐	☐	☐	☐	☐
I am afraid that other people will find fault with me.	☐	☐	☐	☐	☐
Other people's opinions of me do not bother me .	☐	☐	☐	☐	☐
When I am talking to someone, I worry about what they may be thinking about me.	☐	☐	☐	☐	☐
I am usually worries about what kind of impression I make.	☐	☐	☐	☐	☐
If I know that someone is judging me, it has little effect on me.	☐	☐	☐	☐	☐
Sometimes I think that I am too concerned with what other people think of me.	☐	☐	☐	☐	☐
I often worry that I will say or do the wrong things.	☐	☐	☐	☐	☐

Appendix N

Patient Reported Outcome Measurement Information System – Depression

Emotional Distress – Depression – Short Form 8a

Please respond to each question or statement by marking one box per row.

	In the past 7 days...	Never	Rarely	Sometimes	Often	Always
1	I felt worthless	☐	☐	☐	☐	☐
2	I felt helpless	☐	☐	☐	☐	☐
3	I felt depressed	☐	☐	☐	☐	☐
4	I felt hopeless	☐	☐	☐	☐	☐
5	I felt like a failure	☐	☐	☐	☐	☐
6	I felt unhappy	☐	☐	☐	☐	☐
7	I felt that I had nothing to look forward to.	☐	☐	☐	☐	☐
8	I felt that nothing could cheer me up	☐	☐	☐	☐	☐

Appendix O

Reported Outcome Measurement Information System – Anxiety

PROMIS Item Bank v1.0 – Emotional Distress – Anxiety – Short Form 8a

Emotional Distress – Anxiety – Short Form 8a

Please respond to each question or statement by marking one box per row.

In the past 7 days…

		Never	Rarely	Sometimes	Often	Always
1	I felt fearful	☐	☐	☐	☐	☐
2	I found it hard to focus on anything other than my anxiety	☐	☐	☐	☐	☐
3	My worries overwhelmed me	☐	☐	☐	☐	☐
4	I felt uneasy	☐	☐	☐	☐	☐
5	I felt nervous	☐	☐	☐	☐	☐
6	I felt like I needed help for my anxiety	☐	☐	☐	☐	☐
7	I felt anxious	☐	☐	☐	☐	☐
8	I felt tense	☐	☐	☐	☐	☐

Appendix P

Interpersonal Relationships – Eating Disorders: 15-item version

Instructions: Thinking about your experiences with others over the past 28 days, how much would you say that the following statements applied to you?

	Not at all	A little bit	Moderately	Quite a bit	All the time
I find it hard to spend time with others because I worry what they think about my body	☐	☐	☐	☐	☐
I avoid social situations where eating is involved	☐	☐	☐	☐	☐
I avoid getting into conversations with others about food	☐	☐	☐	☐	☐
I avoid socialising with people who are likely to comment on my body or appearance	☐	☐	☐	☐	☐
Other people try to pressure me into eating differently	☐	☐	☐	☐	☐
I avoid intimacy because I worry what others will think of my body	☐	☐	☐	☐	☐
I avoid certain activities that would mean other people might judge my body	☐	☐	☐	☐	☐
My pattern of eating often leads to disagreements or tension with others	☐	☐	☐	☐	☐
My eating patterns make it hard for me to socialise as much as I would like to	☐	☐	☐	☐	☐
Other people worry about what I eat	☐	☐	☐	☐	☐
I prefer to eat alone to avoid conflict with others about what I eat	☐	☐	☐	☐	☐
My eating patterns cause me to withdraw from others	☐	☐	☐	☐	☐
Eating the way I do makes it more likely that others will show concern for me	☐	☐	☐	☐	☐

It is difficult to meet new people as I worry they are judging me or my appearance	☐	☐	☐	☐	☐
My eating patterns cause me to secretive or deceptive with others	☐	☐	☐	☐	☐