

## **Supplementary Materials**

### **Eating Disorder Examination Questionnaire (EDE-Q): Norms and Psychometric Properties in UK females and males**

## Supplementary Materials

### **Phase 1: EDE-Q Norms and Confirmatory Factor Analysis of Original Structure (Sample 1)**

**Table S1:** Percentile Ranks for raw EDE-Q global and subscale scores - Females ( $N=851$ )

	<b>Restraint</b>	<b>Eating Concern</b>	<b>Shape Concern</b>	<b>Weight Concern</b>	<b>EDE-Q Global</b>
Cronbach's alpha ( $\alpha$ )	.827	.784	.913	.861	.950
Percentile Rank					
5	-	-	0.25	-	0.15
10	-	-	0.50	0.20	0.31
15	-	-	0.75	0.40	0.46
20	0.20	0.20	1.00	0.60	0.59
25	0.40	0.20	1.25	0.60	0.71
30	0.40	0.20	1.38	0.80	0.87
35	0.60	0.40	1.63	1.20	0.99
40	0.60	0.40	1.88	1.40	1.77
45	0.80	0.60	2.00	1.60	1.32
50	1.00	0.60	2.25	1.80	1.49
55	1.20	0.80	2.63	2.00	1.68
60	1.20	1.00	2.88	2.40	1.87
65	1.60	1.00	3.13	2.80	2.04
70	1.80	1.20	3.50	3.00	2.33
75	2.20	1.40	3.75	3.20	2.65
80	2.60	1.80	4.00	3.60	2.94
85	3.00	2.20	4.40	4.00	3.21
90	3.40	2.80	4.88	4.40	3.61
95	4.00	3.40	5.25	5.00	4.11
99	5.40	4.80	5.90	5.80	5.00

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**Table S2:** Percentile Ranks for raw EDE-Q global and subscale scores - Males ( $N=224$ )

	<b>Restraint</b>	<b>Eating Concern</b>	<b>Shape Concern</b>	<b>Weight Concern</b>	<b>EDE-Q Global</b>
Cronbach's alpha ( $\alpha$ )	.761	.745	.921	.837	.942
Percentile Rank					
5	-	-	-	-	-
10	-	-	-	-	0.06
15	-	-	0.25	-	0.13
20	-	-	0.38	-	0.23
25	-	-	0.40	0.20	0.28
30	-	-	0.50	0.20	0.36
35	0.20	-	0.63	0.40	0.43
40	0.20	0.20	0.75	0.40	0.56
45	0.40	0.20	1.00	0.60	0.69
50	0.60	0.20	1.25	0.80	0.80
55	0.60	0.20	1.50	1.00	0.99
60	1.00	0.40	1.63	1.20	1.14
65	1.20	0.60	1.88	1.60	1.33
70	1.30	0.80	2.13	1.80	1.48
75	1.80	0.95	2.50	2.00	1.73
80	2.20	1.20	2.88	2.60	2.04
85	2.60	1.40	3.40	3.05	2.48
90	3.10	1.60	4.50	3.40	2.86
95	3.60	2.35	4.98	4.35	3.48
99	4.75	4.05	5.98	5.45	4.68

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### S3: EDE-Q Disordered Eating Behaviours (Sample 1)

In line with previous studies which assess disordered eating behaviours (Luce, Crowther, & Michele Pole, 2008; Quick & Byrd-Bredbenner, 2013), ‘any’ occurrence was defined as at least once, but less than regular occurrence over the past 28 days. ‘Regular’ occurrence of Excessive Exercise was defined as exercising in a “driven” or “compulsive” way as a means of controlling weight, shape or amount of fat, or to burn off calories  $\geq 20$  days over the past 28 days. ‘Regular’ occurrence of Dietary Restraint (item 2) was defined as going for long periods of time ( $\geq 8$  waking hours) without eating anything at all for  $\geq 13$  days over the past 28 days. ‘Regular’ occurrence of Objective Binge Episodes, Self-induced Vomiting and Laxative Misuse was defined as  $\geq 4$  occurrences over the past 28 days (Luce et al., 2008). With the exception of *Dietary Restraint* item, responses to disordered eating behaviours were via single-line entry, in which participants responded largely with numerical values. Of those who responded by text entry (e.g. “*a few/many times*”), such answers were coded as ‘any’ rather than ‘regular’ occurrence, to maintain objective coding of responses (Kelly, Cotter, Lydecker, & Mazzeo, 2017). Percentage frequencies of ‘any’ and ‘regular’ occurrence were calculated, with Chi-square ( $\chi^2$ ) and Fisher’s exact tests conducted to calculate differences in the proportion of reported disordered eating behaviours between females and males (see Table S3).

**Table S3:** Proportion of female ( $N=851$ ) and male ( $N=224$ ) students engaging in disordered eating behaviours (Sample 1)

Key Behaviour	Any Occurrence (%)				Regular Occurrence (%)			
	Females	Males	$\chi^2$ (df)	$p$	Females	Males	$\chi^2$ (df)	$p$
Objective Binge Episodes	23.6	21.4	.478 (1)	.489	24.3	15.2	8.528 (1)	.003
Self-induced Vomiting	3.2	0	-	.003 <sup>e</sup>	1.3	0	-	.133 <sup>e</sup>
Laxative Misuse	2.1	0	-	.020 <sup>e</sup>	1.8	0	-	.051 <sup>e</sup>
Excessive Exercise	32.8	29.9	.671 (1)	.413	2.8	4.5	1.565	.211 <sup>e</sup>
Dietary Restraint	21.9	18.3	1.344 (1)	.246	5.6	2.2	4.395 (1)	.036

Note:  $p$  values corrected for multiple comparisons using false discovery rate (Benjamini & Hochberg, 1995).

<sup>e</sup>= Fisher’s exact test reported, as expected frequencies were less than 5.

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### S4: Clinical Significance (Sample 1)

Percentages of individuals scoring above the cut-off for clinical significance are shown in Table S4. Clinical significance using the EDE-Q measure commonly use a cut-off of  $\geq 4$  (on any of four subscales and/or global score) to classify individuals within the clinical range (Carter, Stewart, & Fairburn, 2001; Mond, Hay, Rodgers, & Owen, 2006). However, an alternative method used to assess clinical significance is to use a statistically derived cut-off based on individuals within the sample who score 2 SDs above the mean ( $\mu + 2\sigma$ ) within the normal population (formula B; (Jacobson & Truax, 1991)). Based on this method, any individual scoring above this statistic are considered to be outside the normal population (Bauer, Lambert, & Nielsen, 2004). As shown in Table S4, using this method ( $\mu + 2\sigma$ ) within a non-clinical population appears sub-optimal. With high scores on Shape Concern and Weight Concern subscales in the present sample, particularly amongst females, this method appears to normalize eating disorder traits if such an elevated criterion were to be used.

**Table S4:** Percentage of females ( $N=851$ ) and males ( $N=224$ ) scoring above cut-offs for clinical significance (Sample 1)

	Clinical Significance Cut-off ( $\geq 4$ )				Clinical Significance Cut-off ( $\mu + 2\sigma$ )			
	Females ( $N=851$ )		Males ( $N=224$ )		Females ( $N=851$ )		Males ( $N=224$ )	
	Cut-off	% Above cut-off	Cut-off	% Above cut-off	Cut-off	% Above cut-off	Cut-off	% Above cut-off
Restraint	$\geq 4.0$	5.41	$\geq 4.0$	3.13	$\geq 4.05$	4.23	$\geq 3.56$	7.59
Eating Concern	$\geq 4.0$	2.82	$\geq 4.0$	0.89	$\geq 3.26$	5.41	$\geq 2.27$	4.91
Shape Concern	$\geq 4.0$	22.09	$\geq 4.0$	13.39	$\geq 5.68$	1.76	$\geq 4.86$	6.70
Weight Concern	$\geq 4.0$	16.10	$\geq 4.0$	5.80	$\geq 5.25$	2.94	$\geq 4.09$	5.36
EDE-Q Global	$\geq 4.0$	5.76	$\geq 4.0$	2.23	$\geq 4.26$	3.76	$\geq 3.39$	5.80

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### **S5: Measurement Invariance Between Females and Males (Sample 1)**

Measurement invariance analysis was undertaken to determine whether the EDE-Q factor structure was equivalent, thus measuring the same underlying construct, between female ( $N=851$ ) and male ( $N=224$ ) samples (Sample 1). The data for the four previously-proposed factor structures were fitted to four measurement invariance models: Configural, Metric (weak), Scalar (strong), and Strict (residual) invariance. Configural invariance indicates whether the two groups have the same factor structure. Metric invariance indicates whether the two groups have the same factor loadings. Scalar invariance indicates whether the two groups have the same item intercepts. Finally, strict invariance indicates whether the two groups have the same item residual variance. The fit of each of these models were compared using a chi-square difference test, which can be seen below in Table S5.

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**Table S5:** Measurement invariance statistics for four models of EDE-Q data in females ( $N=851$ ) and males ( $N=224$ ) (Sample 1)

		$\chi^2$	$df$	RMSEA	TLI	CFI	SRMR	$\chi^2$ diff ( $df$ )	$p$
Four Factor	Configural	3064.72	366	.083	.806	.831	.077	-	-
	Metric	3135.82	387	.081	.813	.828	.091	71.10 (21)	< .001
	Scalar	3356.06	408	.082	.810	.815	.094	220.24 (21)	< .001
	Strict	3495.18	429	.082	.812	.808	.082	139.12 (21)	< .001
Three Factor	Configural	3521.49	412	.084	.793	.815	.079	-	-
	Metric	3596.76	434	.082	.800	.812	.092	75.27 (22)	< .001
	Scalar	3813.69	456	.083	.798	.800	.084	216.93 (22)	< .001
	Strict	3957.82	478	.082	.800	.793	.083	144.13 (22)	< .001
Two Factor	Configural	3822.75	416	.087	.775	.797	.080	-	-
	Metric	3924.90	438	.086	.781	.793	.093	102.15 (22)	< .001
	Scalar	4127.80	460	.086	.781	.782	.095	202.90 (22)	< .001
	Strict	4262.51	482	.085	.784	.775	.084	134.71 (22)	< .001
One Factor	Configural	4620.52	418	.097	.724	.750	.082	-	-
	Metric	4725.56	440	.095	.732	.745	.101	105.04 (22)	< .001
	Scalar	4927.90	462	.095	.734	.734	.103	202.34 (22)	< .001
	Strict	5041.41	484	.094	.741	.729	.090	113.51 (22)	< .001

**NB:**  $\chi^2$ : chi-square;  $df$ : degrees of freedom; RMSEA: Root Mean Square Errors of Approximation; TLI: Tucker–Lewis Index; CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual.

*Configural model* = factor loadings and intercepts free to vary between sexes.

*Metric model* = factor loadings constrained to be equal between sexes, but intercepts free to vary between sexes.

*Scalar model* = factor loadings and intercepts constrained to be equal between sexes.

*Strict model* = residual variances constrained to be equal between sexes in addition to the above constraints.



## Supplementary Materials

### Phase 3: EDE-Q Norms of Original Four-Factor Structure (Samples 2 & 3)

**Table S6:** Descriptive Data - Means (Standard Deviations) for original, four-factor EDE-Q subscales and global score, for female ( $N=489$ ) and male ( $N=164$ ) students (Sample 2).

	Total ( $N=653$ )	Females ( $N=489$ )	Males ( $N=164$ )	$t$	$p$	Cohen's $d$
Age	22.33 (3.84)	22.16 (3.88)	22.86 (3.69)	2.039	.042	.184
BMI	23.53 (5.01)	23.25 (4.99) <sup>a</sup>	24.40 (4.97) <sup>b</sup>	2.539	.011	.231
Restraint	1.50 (1.56)	1.65 (1.60)	1.08 (1.33)	-4.490	<.001	.387
Eating Concern	1.00 (1.23)	1.16 (1.31)	0.53 (0.79)	-7.331	<.001	.582
Shape Concern	2.45 (1.75)	2.68 (1.79)	1.75 (1.44)	-6.663	<.001	.573
Weight Concern	1.94 (1.63)	2.18 (1.67)	1.27 (1.28)	-7.224	<.001	.612
EDE-Q Global	1.73 (1.39)	1.91 (1.44)	1.16 (1.03)	-7.303	<.001	.600

*Note:*  $p$  values corrected for multiple comparisons using false discovery rate (Benjamini & Hochberg, 1995).

BMI: Body Mass Index.

<sup>a</sup> Females ( $N= 488$ ); <sup>b</sup> Males ( $N= 161$ ).

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**Table S7:** Descriptive Data - Means (Standard Deviations) for original, four-factor EDE-Q subscales and global score, for female ( $N=561$ ) and male ( $N=170$ ) non-students (Sample 3).

	Total ( $N=731$ )	Females ( $N=561$ )	Males ( $N=170$ )	$t$	$p$	Cohen's $d$
Age	33.08 (10.46)	32.68 (10.25)	34.39 (11.01)	1.878	.061	.160
BMI	25.96 (6.24)	26.03 (6.73) <sup>a</sup>	25.73 (4.27) <sup>b</sup>	-.535	.500	.053
Restraint	1.72 (1.53)	1.86 (1.58)	1.28 (1.29)	-4.851	<.001	.401
Eating Concern	1.16 (1.43)	1.34 (1.52)	0.55 (0.85)	-8.715	<.001	.647
Shape Concern	2.62 (1.80)	2.91 (1.82)	1.66 (1.37)	-9.598	<.001	.775
Weight Concern	2.18 (1.68)	2.46 (1.70)	1.27 (1.23)	-9.992	<.001	.799
EDE-Q Global	1.92 (1.42)	2.14 (1.46)	1.19 (0.97)	-9.878	<.001	.769

*Note:*  $p$  values corrected for multiple comparisons using false discovery rate (Benjamini & Hochberg, 1995).

BMI: Body Mass Index.

<sup>a</sup> Females ( $N= 557$ ); <sup>b</sup> Males ( $N= 168$ ).

## Supplementary Materials

**Table S8:** Female means (Standard Deviations) for newly-proposed, 18-item, three-factor EDE-Q subscales and global score across three samples.

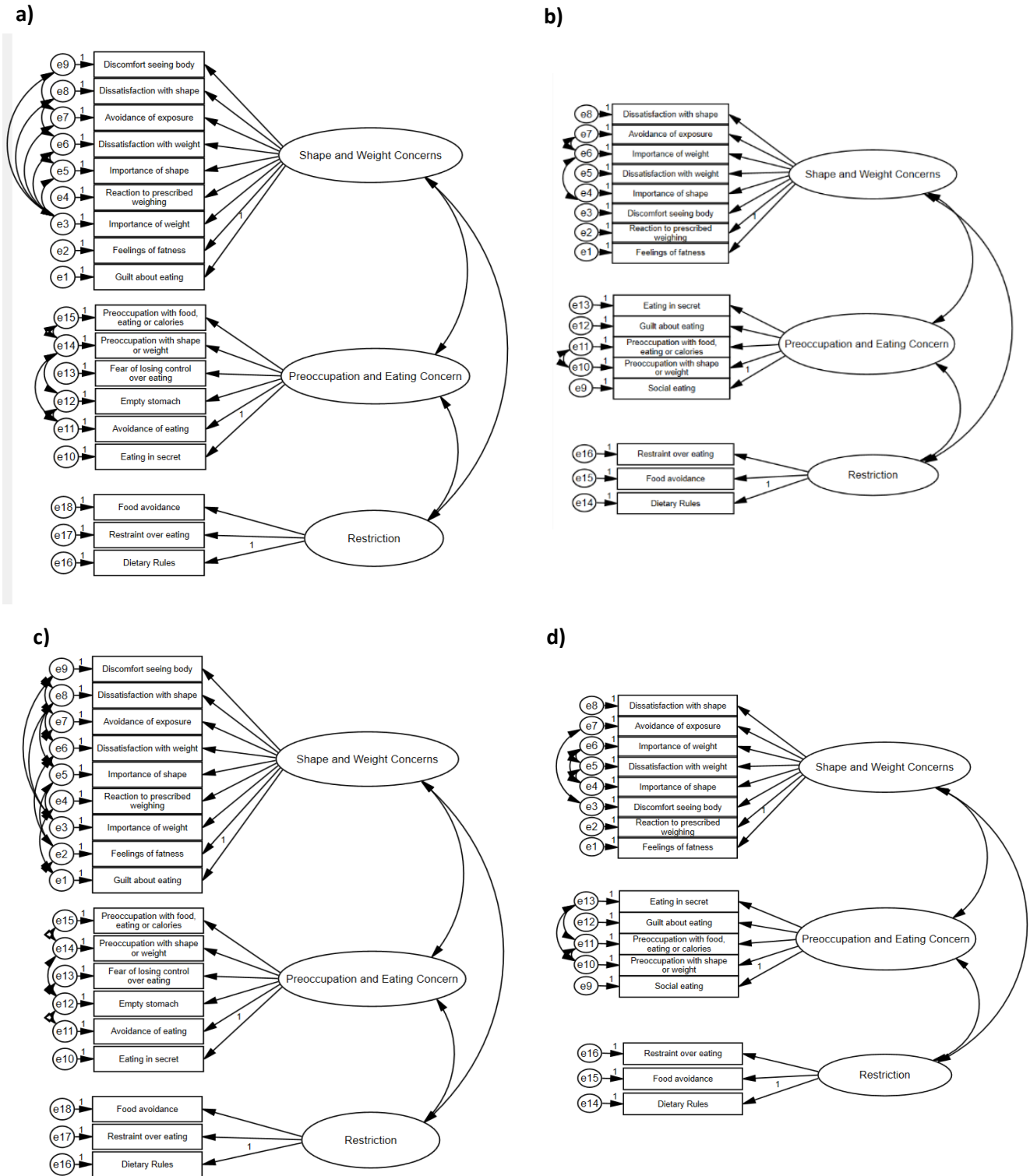
	Students	Students	Non-Students
	(Sample 1)	(Sample 2)	(Sample 3)
	(N=851)	(N=489)	(N=561)
Shape and Weight Concerns	2.46 (1.63)	2.59 (1.74)	2.91 (1.80)
Preoccupation and Eating Concern	.72 (.97)	.88 (1.25)	.99 (1.34)
Restriction	1.90 (1.79)	2.14 (2.00)	2.52 (2.08)
EDE-Q Global	1.69 (1.25)	1.87 (1.43)	2.14 (1.44)

**Table S9:** Male means (Standard Deviations) for newly-proposed, 16-item, three factor EDE-Q subscales and global score across three samples.

	Students	Students	Non-Students
	(Sample 1)	(Sample 2)	(Sample 3)
	(N=224)	(N=164)	(N=170)
Shape and Weight Concerns	1.78 (1.61)	1.80 (1.49)	1.61 (1.37)
Preoccupation and Eating Concern	.59 (.85)	.52 (.73)	.51 (.81)
Restriction	1.52 (1.79)	1.52 (1.83)	1.87 (1.92)
EDE-Q Global	1.30 (1.18)	1.28 (1.08)	1.32 (1.02)

Supplementary Materials

**S10: Modifications to EDE-Q Factor Structures (Samples 2 & 3)**



**Figure S1:** Path diagram showing co-variances made between error terms for student sample of females (a) and males (b), and non-student sample of females (c) and males (d).

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### References

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