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Latent profiles of emotion dysregulation among individuals with binge-spectrum eating disorders: Associations with eating disorder pathology

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Abstract

Objective: Emotion dysregulation (i.e., a multi-component term comprising nonacceptance of emotional responses, difficulty engaging in goal-directed behaviour, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity) is a well-established transdiagnostic risk and maintenance factor for eating disorders. To date, there is limited information on how varying scores on subdomains of emotion dysregulation may yield distinct profiles in individuals with binge-spectrum eating disorders (B-EDs), and how these emotion dysregulation profiles may inform resultant symptomatology.

Method: In the current study, treatment-seeking individuals with B-EDs ($n = 315$) completed the Difficulties in Emotion Regulation Scale (DERS) and Eating Disorder Examination. Latent profile analysis was conducted on the six subscales of the DERS. Identified latent profiles were examined as predictors of eating disorder pathology using linear regression, and a two-class model of emotion dysregulation fit the data.

Results: Class 1 ($n = 113$) was low in all of the DERS subscales, while Class 2 ($n = 202$) was high in all of the DERS subscales. Individuals in Class 2 had a significantly higher frequency of compensatory behaviours in the past month ($F(1,313) = 12.97, p < 0.001$), and significantly higher restraint scores ($F(1,313) = 17.86, p < 0.001$). The classes also significantly differed in terms of

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AUTHOR CONTRIBUTIONS

Devyn R. Riddle contributed to study conceptualization, writing of the original draft, investigation, and revision and editing. Emily K. Presseller contributed to data curation, investigation, data analysis, writing of the original draft, and revision and editing. Adrienne S. Juarascio contributed to study conceptualization, funding acquisition, investigation, methodology, project administration, supervision, and revision and editing.

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to disclose.

IRB STATEMENT

All study procedures were approved and overseen by the Drexel University Institutional Review Board.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

eating concern ($F(1,313) = 20.89, p < 0.001$) and shape concern ($F(1,313) = 4.59, p = 0.03$), with both being higher for Class 2.

Discussion: We found only two distinct classes of emotion dysregulation in B-ED's such that individuals were simply high or low in emotion dysregulation. These results suggest that it may be more valuable for future research to evaluate emotion dysregulation as a cohesive whole rather than conceptualising the construct as having truly distinct subdomains.

Keywords

binge eating; binge eating disorder; bulimia nervosa; emotion dysregulation; latent profile analysis

1 | INTRODUCTION

Emotion dysregulation is a transdiagnostic risk and maintenance factor across eating disorder diagnoses, including binge spectrum eating disorders (B-EDs; Brockmeyer et al., 2014; Lavender et al., 2014; Monell et al., 2018; Puttevils et al., 2021). Within the eating disorder field, emotion dysregulation has been shown to maintain eating disorder symptoms via the affect regulation model. This model proposes that binge eating is used to alleviate negative affect through comfort and distraction due to a lack of access to adaptive emotion regulation strategies and a lack of tolerance for aversive emotional states (Dingemans et al., 2017). Research has also shown, however, that there is variability in the levels of emotion dysregulation that individuals diagnosed with eating disorders experience (Brockmeyer et al., 2014; Lavender et al., 2014; Monell et al., 2018; Puttevils et al., 2021). Identifying different profiles of emotion dysregulation within this population may help the field further understand both maintenance and treatment response of B-EDs on the individual level.

Gratz and Roemer's model of emotion regulation, the widely recognised model from which the term emotion dysregulation is derived, is multifaceted. Its dimensions include awareness and understanding of one's emotions, acceptance of one's emotions, controlling impulsive behaviours and behaving in line with one's goals during negative emotional states, and using the appropriate emotion regulation strategies flexibly in specific situations (Gratz & Roemer, 2004). Each dimension reflects an individual factor in which difficulties may occur, and past research has shown that these dimensions are differentiable (Gratz & Roemer, 2004). Facets of emotion dysregulation are also linked to different treatment outcomes in B-EDs. For example, in a sample of individuals with full and subthreshold bulimia nervosa (BN), those with lower emotional clarity and impulse control skills were less likely to achieve behavioural remission, while individuals with lower emotion acceptance, awareness, clarity, or access to emotion regulation strategies were less likely to achieve full remission (Trainor et al., 2022). If the dimensions of emotion dysregulation are distinct then an individual's difficulty with each of them should be independent, and different emotion dysregulation profiles may exist.

Indeed, in a previous study investigators used latent profile analysis based on cognitive and emotional self-regulation scales to identify four distinct profiles with different levels of eating disorder and general psychopathology (Eichler et al., 2022). The profile classified as 'dysregulated' contained the largest proportion of participants with eating disorder and

focused treatments such as emotion-focused therapy, acceptance and commitment therapy, and integrative cognitive-affective therapy effective in reducing eating disorder pathology and behaviours in individuals with B-ED's (Juarascio et al., 2013; Osoro et al., 2022; Wonderlich et al., 2014). Further investigating heterogeneity among established maintenance factors for eating disorders, such as emotion dysregulation, is essential. The understanding of how symptoms vary between individuals and maintain eating pathology can improve the conceptualisation of symptom profiles over time, as well as treatment personalisation and efficiency. For example, even though CBT-E is a primary evidence-based treatment, specific subsets of individuals with eating disorders may benefit more DBT or another emotion focused treatment.

In the current study, latent profile analysis was conducted on the six subscales of Gratz and Roemer's Difficulties in Emotion Regulation Scale (DERS), which is based on their original model of emotional regulation and is often used in eating disorder research (Gratz & Roemer, 2004; Nordgren et al., 2020). We hypothesised that there would be distinct profiles of emotion dysregulation for participants in a sample with B-EDs due to the independent nature of the subscales. The identified latent profiles were also examined as predictors of eating disorder psychopathology, including the severity of binge eating episodes, compensatory behaviours, and cognitive eating disorder pathology. We hypothesised that profiles with higher levels of emotion dysregulation would be associated with increased eating disorder psychopathology. Identifying unique profiles would indicate that although multiple individuals might receive the same diagnosis at baseline, their emotion dysregulation profile could influence their symptom presentation.

2 | METHOD

2.1 | Participants and procedures

Participants were 315 treatment-seeking adults with B-EDs who presented for participation in one of five treatment studies at the Drexel Center for Weight, Eating, and Lifestyle Science. Participants were recruited from the Philadelphia area (prior to COVID-19) and from across the United States (during COVID-19). When comparing within studies, participants recruited before COVID-19 did not significantly differ from those recruited during COVID-19 in eating pathology (Past month binge eating $ps = 0.16-0.69$; Past month compensatory behaviours $ps = 0.53-0.64$; Past month Eating Disorder Examination (EDE) global score $ps = 0.21-0.97$) or emotion regulation ($ps = 0.17-0.66$) Participants were 83.2% female, 70.8% White, 15.6% Black or African American, 3.8% Asian, and 2.5% More than one race. Mean age was 43.64 (SD = 14.11) and mean BMI was 33.03 kg/m² (SD = 8.18). Approximately 49% of our sample met diagnostic criteria for BED ($n = 153$), 34.9% met criteria for BN ($n = 110$) and the remainder of the sample met criteria for an other specified feeding or eating disorder (OSFED; e.g., BED or BN of low frequency or limited duration). Descriptive statistics for binge frequency, compensatory behaviour frequency, and EDE global scores by study are included in Table 1. After completing a phone screen, participants provided informed consent and completed a baseline assessment comprised of the EDE Interview and measures of BMI and demographic information. Inclusion criteria for the current study were 12 or more binge eating episodes in the past

3 months and age 18. Exclusion criteria for the current study was inability to speak, read, and write English fluently, current or planned pregnancy, bariatric surgery, and severe psychopathology inhibiting engagement in study protocols. See Table S1 for inclusion/exclusion criteria by study. All study procedures were approved by the Drexel University Institutional Review Board.

2.2 | Measures

2.2.1 | Difficulties in Emotion Regulation Scale—The DERS is a widely used measure of emotion dysregulation and was used to assess facets of emotion dysregulation in our study (Gratz & Roemer, 2004). The DERS yields six subscale scores (Nonacceptance of emotions, Difficulty engaging in goal-directed behaviour when distressed, Impulsivity, Lack of emotional awareness, Limited access to emotion regulation strategies, and Lack of emotional clarity) and a total score, with higher scores demonstrating greater difficulties in emotion regulation. The DERS subscales in the present study demonstrated high internal reliability (Cronbach's alpha 0.86–0.93).

2.2.2 | Eating Disorder Examination—The EDE is a diagnostic interview for the assessment of eating disorder symptoms, including binge eating frequency, compensatory behaviour frequency, and global eating pathology. The EDE yields a global score and four subscale scores (Restraint, Eating concern, Shape concern, Weight concern), with higher scores indicating greater severity of eating disorder pathology. The EDE subscales in the present study generally demonstrated adequate internal reliability (Cronbach's alpha 0.58–0.75).

2.3 | Statistical analyses

Latent profile analysis using the *mclust* package in R (Scrucca et al., 2016) was conducted on DERS subscale scores after conducting a scaled value decomposition transformation to reduce the likelihood of a local solution (Scrucca & Raftery, 2015). One to five classes were examined. The best-fit solution was selected using the Analytic Hierarchy process, which utilises a combination of the Aikake's Information Criterion, the Approximate Weight of Evidence, the Bayesian information criterion (BIC), the Classification Likelihood Criterion, and the Kullback Information Criterion (Akogul & Erisoglu, 2017); this procedure was selected as it has demonstrated superior performance to reliance on any of these fit indices alone (Akogul & Erisoglu, 2017). Classes were compared on ED symptoms (frequency of binge eating, frequency of compensatory behaviours, EDE global and subscale scores) and demographic characteristics (age, BMI) using the BCH three step procedure, which involves performing a weighted ANOVA (in which the weights are inversely related to the classification error probabilities) to examine mean differences on variables of interest between latent classes while accounting for classification errors associated with class assignment (Asparouhov & Muthen, 2021). Eta squared (η^2) was reported as a measure of effect size. Diagnostic distribution by group across latent classes was also examined with Chi-Square. All analyses were conducted in R with $\alpha < 0.05$. Extant research suggests that sample sizes of approximately 300 participants are appropriate for latent profile analysis, particularly when using eight or fewer indicator variables, supporting the adequacy of our sample size (Collins & Wugalter, 1992; Nylund et al., 2007).

3 | RESULTS

Latent profile analysis yielded a two-class best fit model based on the Analytic Hierarchy Process and the BIC and SABIC and similar entropy to three-, four-, and five-class solutions (see Table 1 for fit indices). Class 1 ($n = 113$), designated as ‘Lower Emotion Regulation Difficulties’, was characterised by a lower frequency of all types of emotion regulation difficulties and contained 35.9% of all participants. Class 2 ($n = 202$), designated as ‘High Emotion Regulation Difficulties’, was characterised by a high frequency of all emotion regulation difficulties and contained 64.1% of all participants (see Table 2). There was a significant association between diagnosis and group membership; the majority of individuals with BN and OSFED belonged to the ‘High Emotion Regulation Difficulties’ class, while individuals with BED were evenly distributed between both classes (see Table 2). The classes significantly differed on all DERS subscale scores with large effect sizes. Both classes contained a similar proportion of participants recruited pre- and during COVID-19 (Class 1: 68.1% pre-COVID-19; Class 2: 72.3% pre-COVID-19, $\chi^2 = 0.60$, $p = 0.44$).

The groups significantly differed in age, with those in the ‘High Emotion Regulation Difficulties’ group being significantly younger than those in the ‘Lower Emotion Regulation Difficulties’ group (see Table 2). The groups did not differ significantly in BMI, frequency of binge episodes over the past month, or EDE weight concern. The groups were significantly different in frequency of compensatory behaviours in the past month, EDE restraint, EDE eating concern, EDE shape concern, and EDE global score. The ‘High Emotion Regulation Difficulties’ group demonstrated significantly higher eating pathology than the ‘Lower Emotion Regulation Difficulties’ group across these domains.

4 | DISCUSSION

The present study identified heterogeneous profiles of emotion dysregulation among a sample of individuals with B-EDs. Notably, we identified only two profiles, with one profile characterised by fairly high levels of emotion dysregulation and the second profile characterised by low emotion dysregulation. The identification of only two classes, which differed significantly on all subscales of the DERS, may support examination of emotion regulation as a cohesive factor, rather than as having distinct subdomains, among individuals with B-EDs. Alternatively, although our sample size of 300 is widely considered sufficient for latent profile analysis, it is possible that the sample size or aspects of homogeneity in our sample limited identification of other classes which may exist in the broader population of individuals with B-EDs.

Surprisingly, participants in the ‘Lower Emotion Regulation Difficulties’ class demonstrated mean DERS scores consistent with community samples (Aguera et al., 2019; Gratz & Roemer, 2004), while individuals in the ‘High Emotion Regulation Difficulties’ class demonstrated mean DERS scores comparable to those reported previously in eating disorder samples (Aguera et al., 2019; Anderson et al., 2018). These results may suggest that there is a subgroup of individuals with B-EDs who do not demonstrate clinical elevations in emotion dysregulation.

The two classes differed most on the DERS non-acceptance of emotional responses and limited access to emotion regulation strategies, compared to other DERS subscales. These findings are notably consistent with the affect regulation model of binge eating and compensatory behaviours, which posits that intolerance of aversive emotional states and limited access to adaptive emotion regulation strategies produces engagement in binge eating and compensatory behaviours to regulate emotions. The substantial difference between classes on these aspects of emotion regulation may suggest that the affect regulation model is more relevant to individuals in the 'High Emotion Regulation Difficulties' class than individuals in the 'Lower Emotion Regulation Difficulties' class. It is also possible that for those in the 'Lower Emotion Regulation Difficulties' class, the dietary restraint model, where attempts at restriction result in binge eating which then leads to further attempts at restriction, is more relevant (Elran-Barak et al., 2015; Polivy & Herman, 1985).

Although the groups did not differ on frequency of binge eating or weight concern, the 'High Emotion Regulation Difficulties' class endorsed significantly more frequent compensatory behaviours and greater restraint, shape concern, and global eating pathology than the 'Lower Emotion Regulation Difficulties' class. These results largely replicate previous findings linking greater emotion dysregulation to more severe eating disorder symptoms (Bodell et al., 2019; Haynos et al., 2015; Mikhail & Kring, 2019). These results suggest that impairments in emotion regulation (especially emotional acceptance and access to adaptive emotion regulation strategies) may be more strongly related to compensatory behaviours and general eating pathology than to binge eating across the full transdiagnostic sample. Given the strong empirical support for emotion regulation playing a role in binge eating for some individuals (Berg et al., 2015, 2017; Schaefer et al., 2020), it is possible that individuals in the 'Lower Emotion Regulation Difficulties' class experience distinct maintenance factors for binge eating from individuals with emotion regulation deficits, such as dysregulated reward responsivity and inhibitory control deficits. Depending on an individual's specific presentation, clinicians may be able to use this knowledge to select a treatment that would be more effective in their case. For example, a patient displaying higher levels of compensatory behaviours might benefit from an emotion-regulation focused treatment like DBT, whereas someone with lower levels of compensatory behaviours may benefit more from CBT-E.

The present study had a number of limitations. Our sample was predominantly White women, potentially limiting generalisability of our results to more representative samples. While our sample size exceeded what is broadly considered the minimum number of observations needed for latent profile analysis, larger samples generally yield more replicable results in latent variable modelling. None of the multiclass solutions had entropy values above the 0.80 threshold, indicating that group separation was less than optimal. The reliance on cross-sectional data prohibits drawing any causal conclusions about the association between emotion regulation profiles and eating disorder symptomology. We utilised self-report measures of emotion regulation difficulties and eating disorder symptoms, which are subject to biases and limited by participant insight.

Future research should seek to better understand the maintenance factors for binge eating among individuals with normative emotion regulation skills. Additionally, factors that may

correlate with emotion regulation profile, such as duration of illness and socio-economic status, should be further explored. Furthermore, the association between emotion regulation deficits and treatment response has been very sparsely investigated among individuals with B-EDs. Additional work should examine the extent to which frontline treatments impact emotion regulation and whether change in emotion regulation mediates change in compensatory behaviours and global eating pathology across treatment among individuals with difficulties in emotion regulation.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

REFERENCES

- Aguera Z, Paslakis G, Munguia L, Sanchez I, Granero R, Sanchez-Gonzalez J, Steward T, Jimenez-Murcia S, & Fernandez-Aranda F (2019). Gender-related patterns of emotion regulation among patients with eating disorders. *Journal of Clinical Medicine*, 8(2), 161. 10.3390/jcm8020161 [PubMed: 30717125]
- Akogul S, & Erisoglu M (2017). An approach for determining the number of clusters in a model-based cluster analysis. *Entropy*, 19(9), 452. 10.3390/e19090452
- Anderson DA, & Maloney KC (2001). The efficacy of cognitive-behavioral therapy on the core symptoms of bulimia nervosa. *Clinical Psychology Review*, 21(7), 971–988. 10.1016/s0272-7358(00)00076-3 [PubMed: 11584518]
- Anderson LK, Claudat K, Cusack A, Brown TA, Trim J, Rockwell R, Nakamura T, Gomez L, & Kaye WH (2018). Differences in emotion regulation difficulties among adults and adolescents across eating disorder diagnoses. *Journal of Clinical Psychology*, 74(10), 1867–1873. 10.1002/jclp.22638 [PubMed: 29756232]
- Asparouhov T, & Muthen B (2021). Auxiliary variables in mixture modeling: Using the BCH model in Mplus to estimate a distal outcome model and an arbitrary secondary model. *Mplus Web Notes*, 21(11), 1–80.
- Berg KC, Cao L, Crosby RD, Engel SG, Peterson CB, Crow SJ, Le Grange D, Mitchell JE, Lavender JM, Durkin N, & Wonderlich SA (2017). Negative affect and binge eating: Reconciling differences between two analytic approaches in ecological momentary assessment research. *International Journal of Eating Disorders*, 50(10), 1222–1230. 10.1002/eat.22770 [PubMed: 28851137]
- Berg KC, Crosby RD, Cao L, Crow SJ, Engel SG, Wonderlich SA, & Peterson CB (2015). Negative affect prior to and following overeating-only, loss of control eating-only, and binge eating episodes in obese adults. *International Journal of Eating Disorders*, 48(6), 641–653. 10.1002/eat.22401 [PubMed: 25808854]
- Bodell LP, Pearson CM, Smith KE, Cao L, Crosby RD, Peterson CB, Crow SJ, & Berg KC (2019). Longitudinal associations between emotion regulation skills, negative affect, and eating disorder

- symptoms in a clinical sample of individuals with binge eating. *Eating Behaviors*, 32, 69–73. 10.1016/j.eatbeh.2018.12.005 [PubMed: 30654193]
- Brockmeyer T, Skunde M, Wu M, Bresslein E, Rudofsky G, Herzog W, & Friederich HC (2014). Difficulties in emotion regulation across the spectrum of eating disorders. *Comprehensive Psychiatry*, 55(3), 565–571. 10.1016/j.comppsy.2013.12.001 [PubMed: 24411653]
- Byrne SM, Fursland A, Allen KL, & Watson H (2011). The effectiveness of enhanced cognitive behavioural therapy for eating disorders: An open trial. *Behaviour Research and Therapy*, 49(4), 219–226. 10.1016/j.brat.2011.01.006 [PubMed: 21345418]
- Collins LM, & Wugalter SE (1992). Latent class models for stage-sequential dynamic latent variables. *Multivariate Behavioral Research*, 27(1), 131–157. 10.1207/s15327906mbr2701_8
- Danner UN, Sternheim L, & Evers C (2014). The importance of distinguishing between the different eating disorders (sub) types when assessing emotion regulation strategies. *Psychiatry Research*, 215(3), 727–732. 10.1016/j.psychres.2014.01.005 [PubMed: 24491687]
- Dingemans A, Danner U, & Parks M (2017). Emotion regulation in binge eating disorder: A review. *Nutrients*, 9(11), 1274. 10.3390/nu9111274 [PubMed: 29165348]
- Eichler J, Schmidt R, Bartl C, Benecke C, Strauss B, Braehler E, & Hilbert A (2022). Self-regulation profiles reflecting distinct levels of eating disorder and comorbid psychopathology in the adult population: A latent profile analysis. *International Journal of Eating Disorders*, 56(2), 418–427. 10.1002/eat.23857 [PubMed: 36420839]
- Elran-Barak R, Sztainer M, Goldschmidt AB, Crow SJ, Peterson CB, Hill LL, Crosby RD, Powers P, Mitchell JE, & Le Grange D (2015). Dietary restriction behaviors and binge eating in anorexia nervosa, bulimia nervosa and binge eating disorder: Trans-diagnostic examination of the restraint model. *Eating Behaviors*, 18, 192–196. 10.1016/j.eatbeh.2015.05.012 [PubMed: 26122390]
- Gratz KL, & Roemer L (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, 26(1), 41–54. 10.1023/B:JOBA.0000007455.08539.94
- Haynos AF, Roberto CA, & Attia E (2015). Examining the associations between emotion regulation difficulties, anxiety, and eating disorder severity among inpatients with anorexia nervosa. *Comprehensive Psychiatry*, 60, 93–98. 10.1016/j.comppsy.2015.03.004 [PubMed: 25842195]
- Juarascio A, Shaw J, Forman E, Timko CA, 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(4), 459–489. 10.1177/0145445513478633 [PubMed: 23475153]
- Lammers MW, Vroling MS, Crosby RD, & van Strien T (2022). Dialectical behavior therapy compared to cognitive behavior therapy in binge-eating disorder: An effectiveness study with 6-month follow-up. *International Journal of Eating Disorders*, 55(7), 902–913. 10.1002/eat.23750 [PubMed: 35665526]
- Lavender JM, Wonderlich SA, Peterson CB, Crosby RD, Engel SG, Mitchell JE, Crow SJ, Smith TL, Klein MH, Goldschmidt AB, & Berg KC (2014). Dimensions of emotion dysregulation in bulimia nervosa. *European Eating Disorders Review*, 22(3), 212–216. 10.1002/erv.2288 [PubMed: 24619484]
- Levinson CA, Cash E, Welch K, Epskamp S, Hunt RA, Williams BM, Keshishian AC, & Spoor SP (2020). Personalized networks of eating disorder symptoms predicting eating disorder outcomes and remission. *International Journal of Eating Disorders*, 53(12), 2086–2094. 10.1002/eat.23398 [PubMed: 33179347]
- Levinson CA, Hunt RA, Christian C, Williams BM, Keshishian AC, Vanzhula IA, & Ralph-Nearman C (2022). Longitudinal group and individual networks of eating disorder symptoms in individuals diagnosed with an eating disorder. *Journal of Psychopathology and Clinical Science*, 131(1), 58–72. 10.1037/abn0000727 [PubMed: 34941316]
- Linardon J, Fairburn CG, Fitzsimmons-Craft EE, Wilfley DE, & Brennan L (2017). The empirical status of the third-wave behaviour therapies for the treatment of eating disorders: A systematic review. *Clinical Psychology Review*, 58, 125–140. 10.1016/j.cpr.2017.10.005 [PubMed: 29089145]

- Mikhail ME, & Kring AM (2019). Emotion regulation strategy use and eating disorder symptoms in daily life. *Eating Behaviors*, 34, 101315. 10.1016/j.eatbeh.2019.101315 [PubMed: 31357115]
- Monell E, Clinton D, & Birgegård A (2018). Emotion dysregulation and eating disorders-Associations with diagnostic presentation and key symptoms. *International Journal of Eating Disorders*, 51(8), 921–930. 10.1002/eat.22925 [PubMed: 30030942]
- Nordgren L, Ghaderi A, Ljótsson B, & Hesser H (2022). Identifying subgroups of patients with eating disorders based on emotion dysregulation profiles: A factor mixture modeling approach to classification. *Psychological Assessment*, 34(4), 367–378. 10.1037/pas0001103 [PubMed: 34941352]
- Nordgren L, Monell E, Birgegård A, Bjureberg J, & Hesser H (2020). Factor structure of the difficulties in emotion regulation scale in treatment seeking adults with eating disorders. *Journal of Psychopathology and Behavioral Assessment*, 42(1), 111–126. 10.1007/s10862-019-09765-8
- Nylund KL, Asparouhov T, & Muthen BO (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(4), 535–569. 10.1080/10705510701575396
- Osoro A, Villalobos D, & Tamayo JA (2022). Efficacy of emotion-focused therapy in the treatment of eating disorders: A systematic review. *Clinical Psychology & Psychotherapy*, 29(3), 815–836. 10.1002/cpp.2690 [PubMed: 34779059]
- Polivy J, & Herman CP (1985). Dieting and bingeing: A causal analysis. *American Psychologist*, 40(2), 193–201. 10.1037/0003-066x.40.2.193 [PubMed: 3857016]
- Puttevils L, Vanderhasselt M-A, Horczak P, & Vervaet M (2021). Differences in the use of emotion regulation strategies between anorexia and bulimia nervosa: A systematic review and meta-analysis. *Comprehensive Psychiatry*, 109, 152262. 10.1016/j.comppsy.2021.152262 [PubMed: 34265598]
- Schaefer LM, Smith KE, Anderson LM, Cao L, Crosby RD, Engel SG, Crow SJ, Peterson CB, & Wonderlich SA (2020). The role of affect in the maintenance of binge-eating disorder: Evidence from an ecological momentary assessment study. *Journal of Abnormal Psychology*, 129(4), 387–396. 10.1037/abn0000517 [PubMed: 32212743]
- Scrucca L, Fop M, Murphy TB, & Raftery AE (2016). Mclust 5: Clustering, classification, and density estimation using Gaussian finite mixture models. *The R Journal*, 8(1), 205–233. 10.32614/rj-2016-021
- Scrucca L, & Raftery AE (2015). Improved initialisation of model-based clustering using Gaussian hierarchical partitions. *Advances in Data Analysis and Classification*, 9(4), 447–460. 10.1007/s11634-015-0220-z [PubMed: 26949421]
- Telch CF, Agras WS, & Linehan MM (2001). Dialectical behavior therapy for binge eating disorder. *Journal of Consulting and Clinical Psychology*, 69(6), 1061–1065. 10.1037/0022-006x.69.6.1061 [PubMed: 11777110]
- Trainor C, Michael ML, Lampe EW, Presseller EK, Juarascio A, & Manasse SM (2022). Associations between emotion regulation and remission following cognitive behavioural therapy for adults with bulimia nervosa. *European Eating Disorders Review*, 30(4), 426–434. 10.1002/erv.2901 [PubMed: 35398941]
- Wonderlich SA, Peterson CB, Crosby RD, Smith TL, Klein MH, Mitchell JE, & Crow SJ (2014). A randomized controlled comparison of integrative cognitive-affective therapy (ICAT) and enhanced cognitive-behavioral therapy (CBT-E) for bulimia nervosa. *Psychological Medicine*, 44(3), 543–553. 10.1017/s0033291713001098 [PubMed: 23701891]

Highlights

- In a population of individuals with binge-spectrum eating disorders (B-EDs), two classes of emotion dysregulation were identified: high and lower emotion regulation difficulties
- The ‘High Emotion Regulation Difficulties’ class endorsed significantly more frequent compensatory behaviours and greater restraint, shape concern, and global eating pathology
- There may be a subgroup of individuals with B-EDs who do not demonstrate clinical elevations in emotion dysregulation

TABLE 1

Fit indices for one to five-profile models.

# of classes	Class proportions % (n)	Log likelihood	Bayesian information criterion (BIC)	Sample adjusted BIC (SABIC)	Akaike information criterion (AIC)	Consistent AIC (cAIC)	Entropy	Bootstrapped likelihood ratio test (p)	Mean posterior probability	% posterior probability >0.80
1	100.0% (315)	-5458.26	11,071.84	10,986.20	10,970.52	11,098.84	1.00	Not computed, initial reference model	100.0%	100.0%
2	Class 1: 35.9% (113) Class 2: 64.1% (202)	-5364.77	11,045.94	10,871.49	10,839.54	11,100.94	0.72	186.97 (0.01)	Class 1: 85.3% Class 2: 95.3%	Class 1: 71.7% Class 2: 91.6%
3	Class 1: 16.5% (52) Class 2: 47.6% (150) Class 3: 35.9% (113)	-5337.20	11,151.86	10,888.61	10,840.40	11,234.86	0.67	55.15 (0.41)	Class 1: 78.7% Class 2: 90.0% Class 3: 87.0%	Class 1: 48.1% Class 2: 80.0% Class 3: 77.0%
4	Class 1: 15.2% (48) Class 2: 21.6% (68) Class 3: 27.0% (85) Class 4: 36.2% (114)	-5297.46	11,233.46	10,881.39	10,816.92	11,344.46	0.74	79.48 (0.02)	Class 1: 87.8% Class 2: 83.3% Class 3: 82.0% Class 4: 88.7%	Class 1: 70.8% Class 2: 63.2% Class 3: 63.5% Class 4: 77.2%
5	Class 1: 14.0% (44) Class 2: 27.0% (85) Class 3: 18.7% (59) Class 4: 32.4% (102) Class 5: 7.9% (25)	-5278.64	11,356.89	10,916.02	10,835.28	11,495.89	0.75	37.64 (0.46)	Class 1: 81.5% Class 2: 87.3% Class 3: 77.1% Class 4: 87.3% Class 5: 88.0%	Class 1: 59.1% Class 2: 71.8% Class 3: 52.5% Class 4: 77.5% Class 5: 72.0%

Note: All models presented have varying variances and covariances.

TABLE 2

Comparisons of emotion dysregulation profiles on emotion regulation subscales, demographic variables, and eating disorder symptoms.

Variable	'Lower emotion regulation difficulties' (N = 113) mean (SD)	'High emotion regulation difficulties' (N = 202) mean (SD)	F(1,313), p	η^2
DEERS nonacceptance	9.77 (2.58)	17.23 (6.27)	148.88, <0.001	0.35 [0.27, 0.42]
DEERS goals	12.25 (3.22)	16.65 (4.98)	76.48, <0.001	0.25 [0.17, 0.33]
DEERS impulse	10.91 (3.38)	16.12 (5.73)	83.51, <0.001	0.25 [0.17, 0.33]
DEERS awareness	13.24 (4.38)	17.67 (5.15)	63.70, <0.001	0.23 [0.15, 0.31]
DEERS strategies	13.85 (3.47)	22.19 (6.84)	154.19, <0.001	0.36 [0.28, 0.43]
DEERS clarity	9.24 (2.41)	13.08 (4.52)	72.71, <0.001	0.21 [0.14, 0.30]
Age	47.99 (13.49)	41.26 (13.90)	17.42, <0.001	0.12 [0.06, 0.19]
BMI	34.13 (6.37)	32.41 (8.99)	3.36, 0.07	0.09 [0.04, 0.15]
Past month binge episodes	27.11 (19.45)	26.27 (18.94)	0.04, 0.84	0.07 [0.009, 0.08]
Past month compensatory behaviours	6.77 (19.86)	15.56 (21.84)	12.97, <0.001	0.12 [0.06, 0.19]
EDE restraint	1.67 (1.32)	2.34 (1.49)	17.86, <0.001	0.13 [0.07, 0.20]
EDE eating concern	1.51 (1.22)	2.20 (1.38)	20.89, <0.001	0.13 [0.07, 0.20]
EDE weight concern	3.26 (0.99)	3.46 (1.15)	3.57, 0.06	0.07 [0.02, 0.12]
EDE shape concern	3.51 (1.08)	3.80 (1.26)	4.59, 0.03*	0.08 [0.03, 0.14]
EDE global	2.49 (0.86)	2.95 (1.03)	18.41, <0.001	0.11 [0.05, 0.17]
Diagnosis	BED: 76 (68.9%) BN: 19 (17.0%) OSFED: 17 (15.2%)	'High emotion regulation difficulties' (N = 202) Frequency (%) BED: 77 (38.7%) BN: 91 (45.7%) OSFED: 31 (15.6%)	χ^2, p 29.16, <0.001	Cramer's ν 0.31

Note: Frequency of binge eating and compensatory behaviours are based on past-month data. Effect size thresholds are: small η^2 0.01, medium η^2 0.06, large η^2 0.14. Abbreviations: BED, binge eating disorder; DEERS, Difficulties in Emotion Regulation Scale; EDE, Eating Disorder Examination; OSFED, other specified feeding or eating disorder.

* Significance at $p < 0.05$,
 ** denotes $p < 0.01$, and
 *** denotes $p < 0.001$.