This submission contains five datasets.

Dataset 1: Demographics and self-report

Dataset 2: data\_permutation\_first\_negative\_view

Dataset 3: data\_permutation\_second\_attend\_view

Dataset 4: data\_permutation\_second\_reappraisal\_view

Dataset 5: Wide\_format\_table\_for\_ANOVAs

**Dataset 1:**

Relevant information starts column J: age

Ethnicity: 1, 2 and 8: Asian; 3 and 4: Black; 5: mixed; 6 and 7: white; 9: other (more details below)

 

Education: 1 high school; 2: further education; 3 UG degree; 4: PG degree; 5: other



Rating Attend: rating of affect intensity/arousal after seeing the picture for the second time in the attend condition on a scale 1-9

Rating Neutral: same but for neutral pictures

Rating Reappraisal: same but for the reappraisal condition.



ERQ: Emotion regulation questionnaire: ERQ\_R: reappraisal and ERQ\_S: suppression

DERS: Difficulties in Emotion Regulation Scale: Cl: clarity; aw awareness; na: non acceptance; G: difficulties engaging in goal directed behaviours when upset; imp: acting impulsively when upset; str: access to emotion regulation strategies

TAS: Toronto Alexithymia Scale. DIF: difficulties identifying feelings; DDF: difficulties describing feelings; EOT: externally oriented thinking

ERS: emotion reactivity scale. We only used the intensity scale.

EDEQ: eating disorder examination questionnaire. R: restraint; SC: shape concerns; EC: eating concerns; WC: weight concerns

PANAS: Positive and Negative Affect Scale. Pos: positive; neg: negative

NU: negative urgency

DASS: Depression, Anxiety and Stress scale.

IRI: Interpersonal reactivity index. PT: perspective taking; FS: fantasy; EC: empathic concern; PD: personal distress. CE: cognitive empathy (sum of PT and FS). AE: affective empathy (sum of EC and PD)

**Dataset 2, 3, and 4**

These three files are for permutation, with each participant's data in one row and each column is one time point, for all conditions: first viewing (dataset 2); second viewing in the attend condition (dataset 3); second viewing in the reappraisal condition (dataset 4).

**Dataset 5**

The ANOVA table is the LPP mean amplitude at Poz in the 400-1500ms period, for three conditions (1st Negative, 2nd Attend, and 2nd Appraisal). HC: healthy controls; BN: bulimia nervosa

**Additional information about the participants from this dataset, the questionnaires used and the EEG task.**

**Participants**

The study sample consisted of N=35 female healthy controls (HC) recruited via media advertisements and university campus outreach between August 2019 and August 2023. They took part in a pre-selection survey and only those scoring below two on the EDEQ and reporting no ED behaviour and no current mental health diagnosis were included. We also recruited N=32 females with symptoms of Bulimia Nervosa (BN). Out of these, n=4 were recruited from an ED service. The rest (n=28) were recruited via media advertisements and university campus outreach, and all met the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria for a diagnosis of BN, although not all had a diagnosis at the time of recruitment. Groups were matched in terms of age, ethnicity, and education level.

**Questionnaires**

**Eating Disorder Examination Questionnaire (EDE-Q)**

The EDE-Q (Fairburn & Beglin, 2008) contains 28 questions referring to the past 28 days, such that high scores indicate severe ED psychopathology. Questions are scored from 0-6 with a maximum possible total average score of 6. A score equal to or above 4 is commonly used to classify individuals within the clinical range (e.g. Mond et al., 2006), with a score of 2 or below considered representative of a community sample without ED behaviours (Carey et al., 2019). The EDE-Q also contains six questions measuring binge eating; purging; laxative uses; and excessive exercise as a means of controlling their shape or weight. The EDE-Q total score has good internal consistency which was confirmed in our sample (BN α =.84; HC α =.88).

**Emotional Regulation Questionnaire (ERQ)**

The ERQ (Gross & John, 2003) is a 10-item scale designed to measure respondents’ tendency to regulate their emotions using Cognitive Reappraisal or Expressive Suppression. The six questions to measure cognitive reappraisal are scored on a 7-point Likert-type scale, with a maximum score of 42 (a higher score means more tendency to use this strategy). The ERQ has good internal consistency which was also confirmed in our sample (BN α =.87 ; HC α =.92 for cognitive reappraisal).

**Emotional Reactivity Scale (ERS)**

The ERS (Nock et al., 2008) is a 21-item scale that measures emotional sensitivity, intensity and persistence. We only used the seven questions to measure intensity (Items 3, 4, 6, 17, 19, 20, 21). Questions are scored on a 5-point Likert-type scale (0-4), with a maximum score of 28 for intensity (higher score means more intensity). The ERS has good internal consistency which was confirmed in our sample (BN α =.90 ; HC α =.82).

**The Emotion Regulation Task**

Participants were seated in a dimly illuminated testing booth. The visual stimuli were displayed in the centre of a 17-inch PC monitor at a viewing distance of 60 cm. The emotion regulation task had three conditions: Neutral, Maintain, and Reappraisal. Each of these conditions featured 46 unique pictures from the IAPS (Lang et al., 2008), so that each picture was only presented once. Pictures and conditions were randomised across three blocks of 46 trials each. A trial began with a 1000 ms fixation display, succeeded by a neutral or negative picture shown for 1500 ms. Following the picture, participants encountered a text prompt for 5000 ms, with the content varying based on the (randomised) condition. For the neutral condition, the instruction asked participants to observe the image without any specific emotional engagement. For the maintain condition, the instruction encouraged participants to fully engage with their emotional responses (e.g. *“The ambulance crew arrived too late and could not save the driver”* following the picture of a car accident). For the reappraisal condition, the instructions aimed to guide participants to cognitively reframe the negative image, either through focusing on a more positive outcome of the emotional scene (e.g. *“All people were saved thanks to the ambulance crew's hard work”* following the picture of a car accident), or through objectifying the situation by viewing it as fake, from a movie for example. They were told to specifically reframe their interpretation using the description and to not think of something else2. See Supplementary Material for the full list of the IAPS pictures and corresponding descriptions. After the text prompt, there was a subsequent 800 ms fixation period, followed by the re-presentation of the identical image for another 1500 ms. Following this second image display, participants were required to assess and report the strength of their emotional response (i.e. arousal), utilising the Self-Assessment Manikin scale for arousal.

**EEG recording and data analysis**

*EEG recording*. Continuous EEG data were captured using an active electrode system (ActiCHamp, Brain Products, GmbH, Gilching, Germany) from 32 scalp electrodes. These electrodes were positioned according to the 10-20 system (Jasper, 1958) at designated sites including AFz, Fz, FCz, Cz, CPz, Pz, POz, F3, F4, F7, F8, FC3, FC4, FT7, FT8, CP3, CP4, CP5, CP6, P3, P4, P7, P8, PO3, PO4, PO7, PO8, O1, and O2. Additionally, two electrodes were placed on the mastoid bones behind each ear. The vertical electrooculogram (VEOG) was recorded from electrodes below the left eye, and the horizontal electrooculogram (HEOG) from electrodes adjacent to the outer canthi of both eyes.

 EEG data were recorded using Brain Vision Recorder (RRID: SCR\_016331; www.brainproducts.com) at a sampling rate of 1000 Hz. The raw EEG data were band-pass filtered from 0.01 to 30 Hz. All channels were referenced online to the left mastoid electrode and re-referenced offline to an average of both left and right mastoids. Independent component analysis (ICA) was performed on the continuous data to identify and remove eyeblink and eye movement (Jung, et al., 2000). Artifact rejection was performed for individual channel with trials contaminated with muscular movement artefacts (exceeding ±80 *µ*V in all other channels) being removed as artefacts from EEG analysis.

To analyse the ERP components, the remaining EEG was segmented into 1600 ms epochs ranging from 100 ms before to 1500 ms after the onset of the image display to capture the full image presentation. The 100 ms pre-stimulus interval was used for baseline correction. EEG was averaged separately for each group (BN or HC) and for each condition for emotion processing (first presentation of the picture) and emotion regulation (second presentation after the instructions to maintain or reappraise the emotion). All EEG data processing was performed with BrainVision Analyzer software (Brain Products GmbH, Gilching, Germany).

*ERP and statistical analysis*. Based on a collapsed localisers approach (Luck and Gaspelin, 2017), the late positive potential (LPP) was quantified as the average activity where it was maximal on the scalp at POz electrode. Statistical evaluations were performed using JASP statistical software (version 0.18.1.0, www.jasp-stats.org), with independent sample t-test for H1, One-way between-subject Analyses of Variance (ANOVA) for H2, and 2 × 2 mixed ANOVA supplemented by permutation-based FDR analyses for H3. Permutation-based false discovery rate (FDR) estimates (Fields & Kuperberg, 2020) were performed using RStudio (Version 2022-02-03-492, RStudio, 2022, based on the R programming language Version 4.2.0, R Core Team, 2022).