

# The Effects of Appearance-Based Comments and Non-Appearance-Based Evaluations on Body Dissatisfaction and Disordered Eating Urges: An Ecological Momentary Assessment Study

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The current study used ecological momentary assessment (EMA) to investigate whether appearance-based comments, social and performance-based evaluations affected levels of body dissatisfaction (BD) and urges to engage in disordered eating behaviors (DE) throughout daily life. A total of 620 participants completed a baseline questionnaire assessing sociodemographic variables. Participants then downloaded a mobile app which alerted them to complete short surveys assessing their levels of BD, DE urges, and experiences of receiving comments and evaluations six times per day for 7 days. Negative appearance-based comments predicted greater levels of state BD, while positive appearance comments predicted lower levels of state BD. Negative social and performance-based evaluations

predicted an increase in state BD, while positive evaluations predicted a decrease in this outcome variable. No significant predictor was found for the DE urge outcomes. The present findings suggest that receiving negative and positive feedback in various domains of one's life may predict opposite outcomes for body image. However, these effects do not necessarily associate with urges to engage in DE in a nonclinical population.

*Keywords:* body dissatisfaction; disordered eating; appearance-social-performance comments; EMA

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THE OVEREVALUATION of body shape and weight and their control is a core etiological process that contributes to the maintenance of various eating disorders (EDs), as proposed by the transdiagnostic cognitive behavioral model of EDs (Fairburn et al., 2003). Unsurprisingly, appearance-based comments have been associated with body dissatisfaction (BD) and disordered eating (DE) behaviors (Menzel et al., 2010). The transdiagnostic model for EDs (Fairburn et al., 2003) has received strong empirical support and has been considered pertinent in explaining eating pathology in ED patients

(e.g., [Dakanalis et al., 2015](#); [Dalle Grave et al., 2013](#); [Lampard et al., 2013](#)) as well as nonclinical populations (e.g., [Hoiles et al., 2012](#); [Shanmugam et al., 2011](#)). Although the model primarily concerns processes which maintain ED symptomatology, it also recognizes that these mechanisms may overlap with factors that precipitate the initial development of EDs ([Fairburn, 2008](#)).

The enhanced transdiagnostic model further posits that maladaptive cognitive mechanisms, such as severe perfectionism and core low self-esteem, can interact with the core psychopathology (i.e., the overvaluation of body shape and weight and their control) and contribute to the development of DE behaviors ([Fairburn, 2008](#)). Influenced by low self-esteem, individuals with EDs often apply perfectionist standards to the control of their body shape and weight as well as to achievements in other aspects of their lives (e.g., academic performance, social interactions), exhibiting high levels of fear of failure and self-criticism ([Fairburn et al., 2003](#)). This thinking style, in turn, further undermines their self-esteem and reinforces their preoccupation with their body shape and weight, creating a dysfunctional system of evaluating self-worth that might trigger DE behaviors ([Fairburn et al., 2003](#)).

Beyond appearance concerns, maladaptive cognitive mechanisms could permeate all domains of one's life and activate this dysfunctional system of self-evaluation that drives eating pathology. However, much less attention has been given to the potential links between non-appearance-based factors (e.g., social and performance-based evaluations) and DE. More recently, appearance-based factors (e.g., weight-discrepancy—the perceived difference between one's actual and ideal weight) and non-appearance-based factors (e.g., non-appearance discrepancy—discrepancy in self-evaluations unrelated to weight or appearance) were found to have distinct associations with ED-related constructs, independent of each other ([Lesser et al., 2021](#)). This provides evidence for the importance of investigating the unique contributions of non-appearance-based factors.

#### APPEARANCE-BASED COMMENTS

Negative appearance-based comments have long been considered as risk factors for body image problems and EDs ([Menzel et al., 2010](#); [Nerini et al., 2016](#); [Stice, 2002](#)). Cross-sectional studies have corroborated the positive association between negative appearance-based comments from parents and siblings with BD ([Eisenberg et al., 2017](#)) and DE ([Chng & Fassnacht, 2016](#); [Nerini et al., 2016](#)). Longitudinal research also

revealed that weight-teasing from family members and peers during adolescence predicted BD and DE later in life ([Fairweather-Schmidt & Wade, 2017](#); [Juvonen et al., 2016](#); [Puhl et al., 2017](#); [Zuba & Warschburger, 2017](#)).

The limited research investigating the influence of positive appearance-based comments has reported mixed results. While some cross-sectional studies have provided evidence for a negative relationship between exposure to appearance-related compliments and BD ([Mclaren et al., 2004](#); [Nerini et al., 2016](#); [Rodgers et al., 2009](#)), other studies reported no significant associations ([Bailey & Ricciardelli, 2010](#)) or a positive relationship ([Calogero et al., 2009](#); [Cline & Gammage, 2016](#); [Herbozo et al., 2017](#); [Tiggemann & Barbato, 2018](#)). It is argued that positive appearance comments may temporarily reduce BD but ultimately reinforce the fear of weight gain and the thin-ideal, which generates pressure to maintain thinness, reaffirming individuals' desire to control their body shape, weight, and eating behaviors ([Calogero et al., 2009](#); [Rodgers et al., 2009](#)). Appearance-based commentary has been studied extensively in the ED literature. However, the majority of existing studies are cross-sectional in nature; though informative, they have limited power to identify changes over time and are subject to recall biases (i.e., systematic errors or inaccuracies that occur in the recollection of past events or experiences).

More recently, researchers have used ecological momentary assessment (EMA) to investigate individuals' experiences of body image concerns and other DE-related behaviors in their everyday lives ([Smyth et al., 2009](#)). This micro-longitudinal assessment method can capture real-time observations from participants in their natural environment, potentially enhancing ecological validity (i.e., the extent to which a study can be generalized to real-life settings) and reducing retrospective recall bias ([Smyth et al., 2009](#)). Furthermore, recent EMA studies within the DE literature revealed that participants' levels of BD and DE meaningfully changed day-to-day over a study period of approximately 7 to 14 days, thus, demonstrating considerable within-person variabilities for the assessed variables ([Fuller-Tyszkiewicz et al., 2019](#); [Goldschmidt et al., 2014](#); [Mason et al., 2019](#)). These findings provide evidence for the suitability of EMA to investigate a range of ED-related constructs (i.e., BD and DE) and support its potential in advancing our understandings of these relationships on a state level.

Existing EMA studies in the ED literature have further shed light on the effects of appearance-

based concerns and their relationship with BD and DE in daily life (e.g., Fuller-Tyszkiewicz et al., 2019). A recent EMA study by Carels et al. (2019) revealed that experiencing weight stigmatizing events (e.g., a parent or other relatives nagging you to lose weight) was associated with fewer positive and greater negative emotions. In another EMA study, Fuller-Tyszkiewicz et al. (2019) assessed experiences of receiving negative and positive appearance comments and levels of BD 10 times a day for 7 days from 84 female participants. They found that negative appearance comments predicted greater state BD, while positive comments decreased BD. However, as DE was not included as an outcome variable in the study, the effects of appearance comments on DE are unknown.

One EMA study focusing on a clinical ED sample (118 women with anorexia nervosa) found that appearance-related stress (e.g., exposure to media images of food, body weight, or shape) preceded DE outcomes, such as binge eating and vomiting (Mason et al., 2018). However, as this study was conducted in a clinical ED sample, it remains unclear how these relationships would manifest in nonclinical populations. Considering that the severity of eating pathology can vary from severe disorders to subclinical DE experienced in general communities (Shisslak et al., 1995), it is equally important to examine appearance-based concerns that can contribute to maladaptive eating behaviors in nonclinical populations. Overall, while the number of EMA studies directly assessing the effects of momentary appearance-based comments are limited (e.g., Fuller-Tyszkiewicz et al., 2019), their findings nonetheless show promising results which warrant further research.

#### NON-APPEARANCE-BASED EVALUATIONS

Research has consistently found that problematic interpersonal dynamics, particularly negative evaluations regarding one's social worth, could trigger and maintain ED symptomatology (e.g., Arcelus et al., 2013; Rieger et al., 2010; Wilfley et al., 2003). Cross-sectional studies have found that various forms of negative social evaluations (e.g., low perceived acceptance, parental disapproval, and low male partner satisfaction) were associated with negative emotions, body image concerns, and ED symptoms among adolescent and adult females (e.g., Boyes et al., 2007; Cunha et al., 2009; Gerner & Wilson, 2005; May et al., 2006; Schutz & Paxton, 2007; Sharpe et al., 2014). One longitudinal study investigating the effects of seeking and receiving negative feedback via social networking sites found that individuals

who received extremely negative comments in response to posts regarding their personal life (e.g., their relationship with their partner) were more likely to report DE attitudes 4 weeks later (Hummel & Smith, 2015).

In comparison to social evaluations, far fewer studies have investigated the potential psychological influence of evaluations in nonsocial domains, such as performance-based evaluations (e.g., receiving good/bad grades or compliments/criticism at work). Several cross-sectional studies revealed that poor academic performance was associated with poor emotional well-being and an increased risk of developing DE, especially binge eating (e.g., Serra et al., 2020; Tam et al., 2007; Valladares et al., 2016). However, longitudinal evidence is scarce. One recent study surveyed 119 first-year female undergraduates in the United States and found that stress related to academic performance in the first semester of college predicted increases in DE severity in the second semester (Howard et al., 2020). However, this effect was not found in relation to BD. Moreover, this study only assessed students' stress towards their academic performance but not their actual performances (e.g., grades), thus, the predictive effect of performance-based evaluations on emotional well-being and DE remains relatively unclear.

A few studies have attempted to assess the effects of some non-appearance-based (social and performance-related) factors using EMA. For instance, O'Connor et al. (2008) found that unhealthy eating behaviors, specifically, increased consumption of high-fat and sugar snacks, were associated with ego-threatening (e.g., public talk, criticism), interpersonal (e.g., arguments with partners, family problems), and work-related (e.g., difficult work task, late for meetings) stressors. More recent EMA studies have also shown that stress, interpersonal problems, and subsequent negative affect functioned as maintenance factors for DE, namely, emotional eating, and bulimic behaviors (Goldschmidt et al., 2014; Mason et al., 2019; Ranzenhofer et al., 2014; Vandewalle et al., 2017). However, to our knowledge, no EMA study to date has directly assessed the effects of social and performance-based evaluations on BD and DE or compared these non-appearance-based evaluations with appearance-based comments in a nonclinical population. It may be useful to explore these effects in a community sample to better inform prevention and early intervention strategies for common DE behaviors, such as restrictive eating and overeating, which are known precursors to binge eating episodes (Masheb & Grilo, 2006; Stice, 2002).

## THE CURRENT STUDY

Using EMA, the present study aimed to build on the existing body of literature related to the impact of appearance and non-appearance-based feedback by investigating the unique contribution of these predictors on state BD and urges to engage in DE (i.e., restrictive eating and overeating). As this study focused on a community sample, urges to engage in overeating were examined as a proxy measure for binge eating behaviors. Based on the discussion above, it was hypothesized that participants would report greater levels of BD and DE urges after receiving (1) negative appearance-based comments (H1); (2) negative social evaluations (H2); (3) negative performance-based evaluations (H3) in their daily lives. Given that research examining positive non-appearance-based evaluations is rather limited and the influence of positive appearance-based comments remains contested, no specific hypothesis was formulated regarding the effects of positive predictors.

## Method

### PARTICIPANTS

Following approval from the Human Research Ethics Committee of the University of Melbourne, a total of 620 participants (78.7% females), aged between 18 and 48, were recruited from the Research Experience Program (REP) at the University of Melbourne and the general community through online advertisements. After giving consent, participants first completed an online questionnaire and then entered the EMA phase. The demographic characteristics of the sample ( $N = 620$ ) are summarized in Table 1.

### MATERIALS

#### *Trait-Level Measures at Baseline*

**Demographics.** The baseline questionnaire obtained information concerning age, ethnic background, sexual orientation, marital status, the highest level of education completed and current height and weight, which were used to calculate Body Mass Index (BMI).

**Eating Pathology.** Participants also completed the Eating Attitudes Test-26 (EAT-26; Garner et al., 1982), which assessed individuals' attitudes and behaviors related to eating, with higher scores suggesting greater risks for an ED. The EAT-26 consists of 26 items which were rated on a 6-point scale from 0 (*never*) to 5 (*always*). A total score at or above 20 indicated a high level of concern about body image and DE behaviors. The

Table 1  
Demographic Characteristics of the Current Sample ( $N = 620$ )

Variables	Statistics
Age ( $M \pm SD$ )	20.4 $\pm$ 4.30
BMI ( $M \pm SD$ )	22.1 $\pm$ 4.04
Ethnicity (%)	
Caucasian	37.9
Southern Asian/Southeast Asian	27.9
East Asian	22.4
Middle Eastern	2.4
Hispanic or Latin American	1.0
African American	0.3
Aboriginal	0.3
Other	7.7
Marital Status (%)	
Single	67.9
In a relationship	27.6
Married	3.1
De facto	0.8
Separated	0.3
Divorced	0.2
Sexual Orientation (%)	
Heterosexual	78.1
Bisexual	13.4
Lesbian/Gay	3.4
Asexual	1.1
Other	1.6
Prefer not to say	2.4
Highest Completed Education Level (%)	
Year 12 or equivalent	74.0
Bachelor's degree	14.4
Postgraduate degree	5.0
Certificate level / Diploma (Advanced)	4.2
Graduate diploma/certificate	1.6
Still at secondary school	0.8
ED Risk Status (%)	
At risk <sup>a</sup>	22.7
Not at risk <sup>b</sup>	77.3

Note. BMI = Body Mass Index ( $\text{kg}/\text{m}^2$ ).  $M$  = mean,  $SD$  = standard deviation.

<sup>a</sup> EAT-26 scores at or above 20.

<sup>b</sup> EAT-26 scores below 20.

internal consistency of the test in the current sample was strong,  $\omega = .91$ .

#### *State-Level Measures of EMA*

**Appearance-Based Comments.** Participants were asked to indicate whether they had received positive and negative appearance-based comments since the last survey (e.g., "Received a positive/negative comment about my appearance"). Each response was coded as 1 = *yes* and 0 = *no*. Both negative and positive items were included in the analyses. This approach is consistent with previous studies examining appearance-based comments using EMA (Fuller-Tyszkiewicz et al., 2019; Tan et al., 2019).

*Non-Appearance-Based Evaluations.* Negative and positive nonappearance evaluations were assessed using two separate questions. We asked participants, “Since the last survey, have you received negative/positive feedback (explicit and/or implicit) in the following areas? Please tick off all that apply. 1 = yes, in social interactions; 2 = yes, in my close relationships (family/friends/partner); 3 = yes, my competence/performances (academic/work/profession); 4 = yes, other aspects; 5 = none”. Participants’ responses to option 1 (*social interactions*) and option 2 (*close relationships*) were summed to a total social-evaluation score and recoded to 0 = *neither reported* and 1 = *either/both reported*. Performance-based evaluations were coded from the response provided to option 3 (0 = *not reported*, 1 = *reported*). Previous EMA studies have also combined selected measures in such a manner to investigate aggravated effects (Gittus et al., 2020).

*State BD.* Participants were asked “How satisfied are you with your appearance right now?” on a scale from 0 (*completely dissatisfied*) to 10 (*completely satisfied*). This item was reverse coded, such that higher scores indicated greater state BD. The single item approach has been used previously by EMA studies assessing state BD (e.g., Chia et al., 2018; Fuller-Tyszkiewicz, Dias, et al., 2018; Gittus et al., 2020; Tan et al., 2019).

*State Disordered Eating Urges.* Participants were asked to indicate whether they had experienced the urge to engage in DE since the last survey. Responses were coded as 1 = *yes* and 0 = *no*. Items included in the present study were (a) “Urge to consciously restrict food intake to control weight/shape” (restrictive eating); (b) “Urge to eat a large amount of food relative to what others would eat in the same situation/time” (overeating). Prior research in the ED literature has also used similar measures to assess DE behaviors (e.g., Carels et al., 2019; Mason et al., 2019).

## PROCEDURES

In Phase 1, participants were first directed to the Qualtrics online survey platform. Those who gave consent completed a baseline questionnaire collecting demographic information. Participants were then emailed detailed instructions for Phase 2, including how to download a custom-built EMA-based application SEMA3 (Koval et al., 2019). Each participant also received a unique EMA identification code randomly generated by SEMA3, which enabled the linking of Phase 1 and Phase 2 data. One day after the completion of the Phase 1 survey, SEMA3 began sending notifications to participants 6 times per day at semi-

random intervals between 9 a.m. and 10 p.m. for 7 days (a maximum of 42 assessments through Phase 2). At each signal, participants were required to complete a brief 1- to 2-minute survey containing items measuring their state BD, urges to engage in various DE behaviors and experiences of receiving appearance-based comments and non-appearance-based evaluations. Each survey was only accessible within 30 minutes of notification, as preventing later completion of surveys was necessary to ensure sampling coverage across the whole day (e.g., Fuller-Tyszkiewicz et al., 2019). At the end of the study, participants recruited from the university received course credit for participation, and those from the wider community were entered into a draw to win one of five \$100 gift cards.

## DATA ANALYTICAL PLAN

### *Preliminary Analyses*

Several preliminary tests were performed to examine potential biases in the EMA data. First, to determine whether participants who completed more EMA surveys were systematically different from those who completed less, the number of finished surveys (compliance) was correlated against baseline variables. Second, all outcome variables (i.e., BD, and urges to engage in DE) were regressed onto three time-related predictors—namely, the order of assessment (i.e., from the first assessment of day one to the last assessment of day seven), time of day (coded in hour blocks), and day of the week (weekday vs. weekend). Each relationship was assessed in a separate model. Time-related predictors that showed significant associations with outcome variables were included as covariates in relevant models in main analyses.

### *Main Analyses*

Multilevel modelling analyses were conducted to test study hypotheses. A linear mixed model was used for the continuous outcome variable (i.e., BD) and a generalized linear mixed model for dichotomous outcome variables (i.e., urges to engage in DE behaviors). Age, gender, and BMI were included as covariates in all analyses, given that prior research has consistently found their associations with BD and DE (e.g., Hoerr et al., 2002; Neumark-Sztainer et al., 2006; Rø et al., 2012). EAT-26 scores were also controlled for in all analysis, as they reflect one’s risks of body image concerns and DE behaviors (Garner et al., 1982). First, null models comprising only Level 1 outcome variables (i.e., state BD, restrictive eating urge and overeating urge) and no predictors were tested for between-person differences. The multi-

level modelling approach was justified and utilised when significant variance across individuals (i.e., indicated by intraclass correlation coefficient) was observed.

Second, for each Level 1 outcome variable, all six Level 1 predictors (i.e., positive, and negative appearance-based comments; social and performance-based evaluations) were entered into a singular model to assess the strength of fixed effects. Thus, in total, three individual models were run for each of the outcome variables. To ensure that time intervals between measures were sufficient to observe prospective effects, the scores of Level-1 predictors (i.e., appearance-based comments, social or performance-based evaluations) from the previous time point ( $t - 1$ ) were regressed onto the DE outcome variables at time  $t$  (i.e., the urge to engage in restrictive eating and overeating). As the EMA items for predictors and DE outcomes asked about experiences since the last survey, this approach allowed examination of the lagged effects. However, since the state BD item measured ratings for the current moment, the lagged relationship between this outcome variable and Level 1 predictors occurred naturally. Thus, the predictors were not lagged in the model examining BD.

In all analyses, the time lag between assessments and scores on outcome variables at the previous time point were included as covariates to control for the potential influence of time intervals and prior experiences; consistent with the approach taken in prior EMA studies (e.g., Fuller-Tyszkiewicz et al., 2019; Tan et al., 2019). All data preprocessing and analyses were conducted in R studio version 4.0.2 (RStudio Team, 2020).

## Results

### POWER ANALYSES

Estimates of study power were generated through simulation using the *powerlmm* package in R (Magnusson, 2021), and suggested the sample size of 620 participants was adequate to detect small effects (> 5% variance explained) with at least .80 power and  $\alpha = .05$  under a plausible range of assumptions: (1) intraclass correlations ranging from 0.4 to 0.7, (2) average cluster size of 25–34 reflecting EMA compliance rates of ~60% to ~80%, and (3) small variance in random slope for modelled Level 1 effects. Such effects are consistent with findings reported from prior body image focused EMA studies (e.g., Fuller-Tyszkiewicz, Richardson, et al., 2018; Yee et al., 2020).

### DESCRIPTIVE STATISTICS AND PRELIMINARY ANALYSES

Descriptive statistics for Level 1 predictors and outcome variables in the sample are displayed in Table 2. Overall, positive comments and evaluations were more prevalent than negative ones, especially in the social domain. The urges to engage in restrictive eating were experienced more commonly by participants than the urge to overeat. There was no concern with multicollinearity among the predictors as the correlations between the variables were small (see supplementary Table 1). The average number of EMA surveys completed by participants in the sample was 27.6 ( $SD = 11.6$ ,  $\min = 1$ ,  $\max = 42$ ) out of 42 possible assessments (65.7%). Compliance was only significantly associated with one trait variable, gender ( $p = .01$ ), and unrelated with others, i.e., age ( $p = .95$ ), BMI ( $p = .37$ ), ethnicity ( $p = .85$ ), marital status ( $p = .75$ ), sexual orientation ( $p = .30$ ), level of education ( $p = .14$ ) and ED risk status ( $p = .07$ ).

Linear mixed models were used to examine whether participants' responses changed systematically over time (reactivity effects). The results showed that the order of assessment significantly predicted state BD ( $b = .006$ ,  $t = 5.26$ ,  $p < .001$ ), the urge to engage in restrictive eating ( $b = -.02$ ,  $z = -7.17$ ,  $p < .001$ ), while it was unrelated to the urge to overeat,  $p = .66$ . Time of day significantly predicted urges to engage in restrictive eating ( $b = -.05$ ,  $z = -6.02$ ,  $p < .001$ ), and overeating ( $b = .03$ ,  $z = 2.91$ ,  $p = .004$ ), while its relationship with BD was nonsignificant,  $p = .35$ . Day of the week was not significantly associated with any outcome variables. To control for the reactivity effects, order of assessment was included as a covariate in all models, except for the overeating outcome variable; and time of day was included in all models, except for BD.

Additional analyses showed that there were some significant differences between participants recruited from the REP program ( $N = 533$ ) and those from the general community ( $N = 87$ ) in terms of age ( $p < .001$ ), BMI ( $p = .005$ ), marital status ( $p = .001$ ), level of education ( $p < .001$ ), sexual orientation ( $p < .001$ ), and ED risk status ( $p = .007$ ). Thus, the group variable indicating the source of the recruitment (REP vs. community) was also controlled for in the main analyses. Detailed comparisons of the subgroups are presented in supplementary Table 2.

### MAIN ANALYSES

As shown in Table 3, negative appearance-based comments predicted greater levels of state BD,

Table 2  
Descriptive Statistics for Predictors and Outcome Variables

		<i>M</i>	<i>SD</i>	Possible range	Non-zero counts <sup>a</sup>	Non-zero counts <sup>b</sup>	Frequency
Predictors	1. Negative appearance-based comments	n/a	n/a	0 or 1	185	470	2.8%
	2. Positive appearance-based comments	n/a	n/a	0 or 1	382	1682	9.8%
	3. Negative social evaluations	n/a	n/a	0 or 1	399	1786	10.5%
	4. Positive social evaluations	n/a	n/a	0 or 1	577	5756	33.7%
	5. Negative performance-based evaluations	n/a	n/a	0 or 1	378	2216	13.0%
	6. Positive performance-based evaluations	n/a	n/a	0 or 1	438	2426	14.2%
Outcome variables	1. BD	5.2	2.4	0 - 10	n/a	n/a	n/a
	2. Restrictive eating*	n/a	n/a	0 or 1	336	2532	14.8%
	3. Overeating*	n/a	n/a	0 or 1	222	893	5.2%

Note.

<sup>a</sup> Refers to the number of participants (out of 620) who reported at least one event for the categorical variables.

<sup>b</sup> Indicates the total number of occurrences across all assessments.

\* Indicates the urge to engage in the outlined DE behaviors; n/a = not applicable.

Table 3  
Fixed Effects of Level 1 Predictors on State BD and Urges to Engage in DE

Predictors	BD		The urge to engage in restrictive eating		The urge to engage in overeating	
	<i>R</i> <sup>2</sup> <sub>m</sub> / <i>R</i> <sup>2</sup> <sub>c</sub> : 0.10 / 0.61		<i>R</i> <sup>2</sup> <sub>m</sub> / <i>R</i> <sup>2</sup> <sub>c</sub> : 0.22 / 0.73		<i>R</i> <sup>2</sup> <sub>m</sub> / <i>R</i> <sup>2</sup> <sub>c</sub> : 0.11 / 0.65	
	Estimates [95% CI]	<i>p</i>	Odds ratio [95% CI]	<i>P</i>	Odds ratio [95% CI]	<i>p</i>
Negative appearance-based comments	.38 [.19 – .57]	<.001	1.43 [.90 – 2.27]	.13	1.05 [.60 – 1.85]	.86
Positive appearance-based comments	-.38 [-.49 – -.26]	<.001	1.04 [.79 – 1.37]	.77	.99 [.69 – 1.42]	.96
Negative social evaluations	.38 [.28 – .49]	<.001	1.18 [.93 – 1.48]	.17	1.15 [.85 – 1.54]	.36
Positive social evaluations	-.47 [-.55 – -.40]	<.001	1.08 [.90 – 1.31]	.40	.88 [.69 – 1.13]	.32
Negative performance-based evaluations	.30 [.20 – .40]	<.001	1.21 [.96 – 1.51]	.10	1.12 [.84 – 1.49]	.45
Positive performance-based evaluations	-.24 [-.32 – -.15]	<.001	1.07 [.86 – 1.32]	.57	1.19 [.90 – 1.56]	.22

Note. CI = Confidence Interval.

while positive appearance comments were associated with lower levels of state BD. Negative social and performance-based evaluations predicted an increase in state BD, while positive evaluations predicted a decrease in this outcome variable. However, no significant predictor was found in relation to the DE urge outcomes.

### Discussion

The primary aim of the current study was to investigate the effects of negative and positive appearance-based comments and non-appearance-based evaluations (social and performance-based evaluations) on BD and urges to engage in DE throughout daily life. We hypothesized that (1) negative appearance-based comments (H1); (2) negative social evaluations (H2) and (3) negative performance-based evaluations (H3) would be related to greater levels of BD and DE urges in everyday life. In partial support of our three hypotheses, the findings showed that

negative appearance-based comments, social and performance-based evaluations predicted an increase in state BD. The analyses also revealed that positive comments and evaluations were associated with decreased levels of state BD. However, there were no significant relationships with our DE urges outcomes.

#### THE EFFECTS OF APPEARANCE-BASED COMMENTS

The present findings revealed that receiving negative appearance-based comments predicted changes in state BD as hypothesized (H1), replicating the results of previous EMA studies (Fuller-Tyszkiewicz et al., 2019). Positive appearance comments were related to decreased levels of BD, which is in line with the few previous appearance-based EMA studies assessing positive appearance comments (Fuller-Tyszkiewicz et al., 2019). Together, these findings support the predictive effect of appearance-based commentary on

body image concerns and highlight the role of body shape and weight-related evaluations (Fairburn, 2008).

Contrary to our hypothesis (H1), receiving appearance-based comments was not significantly associated with urges to engage in DE. This finding contradicts previous cross-sectional (Chng & Fassnacht, 2016; Nerini et al., 2016) and longitudinal (Puhl et al., 2017; Zuba & Warschburger, 2017) studies that have repeatedly found a significant relationship between negative appearance-based commentary and ED symptoms. Considering that these studies mainly examined long-term systematic experiences (e.g., receiving appearance comments from parents or siblings over a long period of time), it is possible that momentary appearance-based comments, which were the focus of the current study, may not have been strong enough to induce desires to engage in DE behaviors in our nonclinical sample. Future studies could consider investigating this relationship in a clinical ED sample.

#### THE EFFECTS OF NON-APPEARANCE-BASED EVALUATIONS

As hypothesized (H2 and H3), our results also showed that negative and positive social and performance-based evaluations predicted changes in levels of state BD in the opposite directions, suggesting that evaluations in non-appearance-based areas may be extended to appearance-based concerns. While some cross-sectional studies have supported the positive link between poor relationship qualities and body image disturbances (e.g., Boyes et al., 2007; Cunha et al., 2009; Sharpe et al., 2014), scarce research has directly investigated the influence of social or performance-based evaluations on BD.

One potential reason for the present finding is that receiving feedback on one aspect of one's life (e.g., social, or performance-based) may affect the individual's perception of another aspect of themselves (e.g., body shape and weight), as the individual's emotional state and self-esteem have been influenced by the initial feedback. Considering that individuals with eating pathology may be more inclined to attribute negative social evaluations to their "poor" appearances and exhibit negative cognitive biases, we anticipate that the relationship between non-appearance-based evaluations and BD would be more pronounced in a clinical ED sample, an area worthy of further research. Future studies should also explore whether the distinct ED subtypes (e.g., Anorexia Nervosa, Bulimia Nervosa, and Binge Eating Disorder) are differently susceptible to the negative and positive

appearance comments and social and performance evaluations assessed in the current study.

It is worth outlining that all relationships between the non-appearance-based predictors and the DE urge outcomes were nonsignificant. Thus, suggesting that the aforementioned effects of critical feedback relating to one's social worth and performance on state BD do not necessarily translate into maladaptive eating behaviors in a nonclinical population. Previous studies that found significant effects of non-appearance-based situational triggers (e.g., social interactions and daily stressors) on DE-related outcomes were conducted predominantly with individuals already exhibiting eating pathology, or at least, an increased risk of developing EDs (e.g., Goldschmidt et al., 2014; Mason et al., 2019; O'Connor et al., 2008; Ranzenhofer et al., 2014). Considering that the current sample was predominantly comprised of individuals who were at a low ED risk (i.e., 77.3% presenting with a lower-than-threshold EAT-26 [Garner et al., 1982] score), one possible explanation for the null finding is that momentary social and performance-based evaluations (negative and positive) may not have been strong enough to trigger maladaptive coping behaviors in the current community-based nonclinical sample. Alternatively, it is possible that individuals without eating pathology do not necessarily resort to eating to mitigate emotional distress and augment self-esteem following critical feedback. Future studies could try to explore these two possible explanations in a clinical ED sample comprising different ED subtypes.

#### IMPLICATIONS

The present study revealed a link between the experience of receiving positive and negative appearance-based comments as well as social and performance-based evaluations, and an established risk factor for ED (i.e., BD). The current findings extend prevailing ED theories that highlight the role of body image concerns (e.g., the transdiagnostic model; Fairburn et al., 2003) to a state-level by demonstrating the direct effects of momentary negative appearance-based comments on BD. Our findings therefore suggest that comments regarding one's appearance, body shape, and weight in general should be treated with caution due to the detrimental effects of negative appearance comments and potentially mixed influence of positive appearance comments. More importantly, the current study offers novel insights into the influence of non-appearance-based evaluations, contributing to

an understudied area in the ED literature. We found that other evaluations regarding one's social worth or performance/competence (negative and positive) were associated with one's self-evaluations of body shape and weight (i.e., BD). Further research is needed to validate these findings and explore potential factors that might mediate these relationships, such as self-esteem and perfectionism, which have been found to mediate the relationship between various risk factors (e.g., sociocultural influences; BD) and ED symptoms (Brechan & Kvaalem, 2015; Dryer et al., 2016). On the other hand, the null effects regarding DE outcomes suggest that these everyday experiences (receiving comments and evaluations) may not be directly associated with the urge to engage in DE in a nonclinical sample.

At a practical level, the findings may inform existing mental health services targeting young people, especially female university students (the predominant group in the current sample). Momentary negative feedback, appearance-based or non-appearance-based, can exert detrimental influences on one's body image. Hence, how one copes with critical social feedback on a momentary basis could have long-term consequences on their emotional well-being and self-perception. Individuals with a negative thinking style may be more likely to suffer from negative other and self-evaluations and, thus, are at an increased risk of developing maladaptive coping behaviors. Preventative and early intervention programs aimed to help students modulate emotional distress, adjust problematic thinking styles, and develop adaptive coping skills might therefore be particularly helpful for maintaining emotional well-being and reducing the risk of developing eating pathology.

#### LIMITATIONS

Several limitations need to be addressed. First, in the present study, broad single-item measures were used to balance breadth of assessment against participant burden, which is common for EMA studies. However, this measurement approach may have failed to capture other factors of interest, for instance, the content of comments and the identity of comment-givers (i.e., who gave the comments). This issue may be particularly pertinent to the assessment of social evaluations due to the abstract nature of this construct. Although in the current study most EMA items referring to the outcome variables (e.g., BD, urge to engage in DE) have been validated by previous studies (e.g., Chia et al., 2018; Fuller-Tyszkiewicz, Dias,

et al., 2018), the EMA questions for non-appearance-based evaluations were novel, which may have produced a less precise measurement of the true effect of these predictor variables. Future research may consider incorporating more detailed assessment items for constructs in the social and performance-based evaluation fields to capture the content of such evaluations.

Second, although the decision to assess urges to engage in DE (rather than actual behaviors) allowed for a broad collection of data in a nonclinical population, it may create complications for capturing certain DE behaviors, such as overeating. Specifically, some people might experience an increased urge to eat following negative experiences, without necessarily thinking about the specific quantity of food that they plan to consume. In other words, overeating might emerge as a behavioral consequence once an individual has started to eat in response to their emotional distress, rather than arising as a specific desire prior to eating, which may lead to less reported urges. Nonetheless, the present study still captured a high frequency of overeating urges compared to prior EMA studies that measured theoretically relevant ED constructs, such as binge eating (e.g., Tan et al., 2019). Future studies should consider assessing actual binge eating behaviors (i.e., consuming usually large amounts of food and experiencing a sense of loss of control) for enhanced clarity.

Finally, in the current study several variables (e.g., appearance-based comments and performance-based evaluation as well as some of the DE variables) had low frequency for the sample overall, and there were individuals who did not report these events at all during the EMA phase. While the impact of zero variance within the group on our overall model results is unclear from what the current literature has shown, we can assume that a large imbalance in the categories for the predictors in our model reduced the magnitude of the effects that these variables may have had in our models (Babchishin & Helmus, 2016). Thus, the null effects observed for the categorical variables with low frequency events in the present study should be interpreted with caution.

#### CONCLUSIONS

The present study is the first to concurrently investigate the influence of negative and positive appearance-based comments and non-appearance-based evaluations using EMA on a range of ED related outcomes variables (including BD and urges to engage in DE). The current findings indicate that receiving negative and positive

feedback in people's everyday lives may predict changes in state BD in the opposite direction. However, it also suggests that the effect of these momentary experiences on DE urges is limited in a nonclinical population as all relationships relating to DE outcomes were nonsignificant. Nevertheless, the present study provides promising evidence for the notion that negative external feedback could activate a dysfunctional system of self-evaluation that may ultimately trigger maladaptive eating behaviors, which warrants further exploration. Future EMA studies may consider investigating the hypothesized mechanisms (i.e., the associations between non-appearance-based concerns and DE) that contribute to eating pathology in a clinical sample. Such work could enhance the current understanding of potential contextual triggers of EDs and offer informative implications for early intervention and treatment efforts.

### Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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