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## Characterizing positive and negative emotional experiences in young adults with Borderline Personality Disorder symptoms

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### Abstract

**Objectives**—Some researchers suggest that Borderline Personality Disorder (BPD) is characterized by elevated negative emotion; others argue that BPD involves both reduced positive and increased negative emotion. This study characterizes the emotional experiences of individuals with BPD symptoms in a combined university and community sample.

**Methods**—Participants ( $N=150$ ) were completed a clinical interview assessing BPD symptoms and self-report measures of positive and negative emotion. A subset ( $n=106$ ) completed a measure of emotion daily for two weeks. Pearson's correlations and multilevel modeling were used to examine the cross-sectional and longitudinal relationships between BPD symptoms and emotions.

**Results**—BPD symptoms were robustly related to increased negative emotion; this relationship remained after accounting for positive emotion. BPD symptoms were weakly related to decreased positive emotion; this relationship was no longer significant after accounting for negative emotion. BPD symptoms predicted higher levels of negative and not positive emotion over 14 days. These patterns held for subscales assessing intensity, frequency, and duration of negative and positive emotions.

**Conclusions**—Findings suggest that individuals with BPD features are chiefly distinguished by elevated negative emotional experience.

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Borderline personality disorder (BPD) is a severe mental disorder characterized by diverse symptoms that affect many areas of functioning (Linehan, 1993). Despite symptom variability, there is a general consensus that emotional disturbances serve as a core feature of BPD (Glenn & Klonsky, 2009) and is a robust predictor of BPD symptoms over time (Tragesser, Solhan, Schwartz-Mette, & Trull, 2007). Among those with BPD, mood disturbances are associated with more negative clinical outcomes (Bagge et al., 2004) and may endure even after other BPD symptoms have diminished (Zanarini, Frankenburg, Hennen, & Silk, 2003). Given the clinical importance of affective disturbances in BPD, this study seeks to better understand the nature of this dysfunction. Specifically, we test whether disturbances involve both negative and positive affect, or negative affect exclusively.

## **BPD as a Disorder of Problematic Negative and Positive Emotion**

Berenbaum and colleagues (2003) argued that BPD is best characterized as a general dysfunction of both positive and negative emotions. Researchers using psychophysiological procedures observed that, in comparison to healthy controls (Herpertz et al., 1999) and individuals with avoidant personality disorder (Herpertz et al., 2000), individuals with BPD had significantly lower levels of skin conductance for images of all emotional valences: pleasant, unpleasant, and neutral. This suggests a dampening of emotional response to both positive and negative stimuli. More recently, evidence from Renneberg and colleagues (2005) showed that compared to non-clinical controls, BPD patients reacted to both positive and negative film clips with reduced facial muscle activity (Renneberg et al., 2005). Additionally, research revealed that BPD patients, compared to controls, exhibited an enhanced recall of negatively valenced words and reduced recall of positively valenced words (Domes et al., 2006). Altogether, these results imply an association between BPD and impaired responding to stimuli of all emotional valences, which lends support to the idea that BPD involves general, positive and negative, emotion dysfunction.

## **BPD as a Disorder of Negative Emotion**

There is also evidence that difficulties with negative emotions play a larger role in BPD than difficulties with positive emotions. Levine and colleagues (1997) found that in BPD patients, higher emotional intensity and reactivity, and lower accuracy in recognizing emotional facial expressions were specific to negative emotions, and did not apply to positive emotions. Additionally, Silbersweig and colleagues (2007) reported that BPD patients rated negative emotional words more negatively than healthy control participants, but showed no differences in ratings of positive or neutral words; they supported their findings with neuroimaging data showing reduced brain activity in BPD patients during negative emotion-related tasks. Further, von Ceumern-Lindenstjerna and colleagues (2010) showed that female adolescents with BPD tend to orient their attention towards negative facial expressions and do not exhibit a bias toward or away from positive expressions. These findings are not consistent with the perspective offered by Berenbaum and colleagues, and instead support the view that BPD primarily involves difficulties with negative emotions.

## **BPD and Prospective Variability in Positive and Negative Emotion**

While these studies detected abnormalities in the processing of positively and negatively salient stimuli in laboratory settings, the relationship between retrospective reports of affective experiences and those experienced in daily life are modest at best (Solhan, Trull, Jahng, & Wood, 2009). Thus, in order to extend cross-sectional findings and determine whether similar abnormalities characterize the actual experience of emotion in the daily lives of those with BPD, momentary assessments are needed (Solhan et al., 2009). Recent studies characterizing affect using prospective methods have examined how emotional valence plays a role in BPD. For example, in Russell and colleagues' (2007) study, BPD was associated with greater mean negative and not positive affect over the course of 20 days; however, participants showed greater intra-individual variability in positive affect, but not negative affect. This suggests that although individuals with BPD experience higher levels of negative

emotions, they experience greater changes in their positive emotion experience. Research in this area is limited and more studies are needed to replicate and extend these findings.

One way to extend these findings is to garner a more detailed picture of the relationship between emotional valence and BPD. Advances in the understanding of affective experiences suggest that emotional reactivity, a crucial factor associated with BPD symptom severity (Rosenthal et al., 2005; Sauer & Baer, 2010), may be conceptualized on multiple dimensions, including emotional intensity, duration, and frequency (Nock, Wedig, Holmberg, & Hooley, 2008). Use of a dimensional measure of emotion would be useful for furthering our understanding of emotional disturbances associated with BPD. However, dimensional measures of specific emotional states, while recently developed for use to study other phenomena (Victor & Klonsky, 2013), have yet to be applied to examine the nuances in the relationship between daily affective disturbances and BPD.

The present study was designed to determine if BPD symptoms are associated with elevated negative emotional experiences, diminished positive emotional experiences, or both. To meet this aim, we assessed emotional experiences using dimensional self-report measures of emotional functioning in the laboratory and on a daily basis using diary methodology across a two-week interval. This research will provide details regarding dimensional variability across different aspects of emotional reactivity in BPD and is particularly relevant given that the DSM-5 provides proposed dimensional BPD criteria (APA, 2013).

## Method

### Participants

Participants ( $N = 150$ ) were recruited from the psychology research participation system for a western, Canadian university and the surrounding community. 74.4% of this sample were undergraduate students and 3.8% were graduate students; 22.8% were not enrolled in university studies. Those presenting with cognitive impairments or language barriers that would preclude the provision of informed consent were excluded.

### Measures

**Demographics**—Demographic variables, including age, gender, and ethnicity, were assessed using a background questionnaire developed by the authors.

**Structured Interview for DSM-IV Personality (SIDP; Pfohl, Blum, & Zimmerman, 1995)**—This is an interviewer-administered, semi-structured assessment for all of the DSM-IV personality disorders. In this study, only BPD items were administered. Scores from the BPD items were determined by summing the scores from each BPD criterion (each receives a score from 0 to 3, for a total score from 0 to 27), which is consistent with previous research (Jane, Pagan, Turkheimer, Fiedler, & Oltmanns, 2006). A score of 2 or 3 indicates the presence of a BPD criterion. Reliability and validity has been established in both non-treatment-seeking and patient populations (Jane et al., 2006; Pilkonis et al., 1995).

**Structured Clinical Interview for DSM-IV Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 2002)**—The SCID-I is a structured clinical interview used to assess for past and current Axis I psychopathology (e.g., mood, anxiety, substance use). The SCID-I was administered by a Masters-level researcher trained to reliability on the SCID-I; reliability indices were not available for this study. However, previous studies have indicated that the inter-rater and test-retest reliabilities of the SCID-I is fair to excellent (Zanarini et al., 2000).

**Positive and Negative Affect Schedule – Expanded Form (PANAS-X; Watson, & Clark, 1991)**—The PANAS-X is a 60-item measure of typical affective trait characteristics, which correspond to two scales: general positive affect and general negative affect. Originally validated in an undergraduate and community adult sample, this measure has reported Cronbach's alpha coefficients of .86 to .90 for the Positive Affect scale, and .84 to .87 for the Negative Affect scale. In this study, PANAS-X was used to test the association between positive and negative affect and BPD features, and both the Positive and Negative Affect scales demonstrated excellent reliability (Cronbach's  $\alpha = .89$  and  $.88$ , respectively).

**Multidimensional Emotion Questionnaire (MEQ; Victor & Klonsky, 2013)**—Given that the PANAS-X lacks information regarding differences in specific aspects of emotional reactivity (i.e., frequency, duration, intensity), the MEQ was used to provide fine-grained and detailed information about aspects of emotion experiences. The MEQ assesses twenty discrete emotions – ten positive (e.g., happy, cheerful, joyful) and ten negative (e.g., sad, afraid, angry) – on three subscales of positive and negative emotional reactivity: frequency (i.e., how often), intensity (i.e., how intense), and duration (i.e., how long-lasting). Each emotion is rated on these four domains (frequency, intensity, duration) using a five-point Likert scale that ranges from *almost never/very low/very short/very easy* to *almost always/very high/very long/very difficult*, respectively. The MEQ also assesses regulation in addition to reactivity, but regulation scales were not utilized for the present study. Two types of scales were constructed from these ratings: emotional reactivity scales and overall positive and negative emotion scales. Emotional reactivity scales refer to separate scales that index frequency, intensity, and duration of both positive and negative emotions by averaging each score across the ten emotions for each positive or negative subscale (e.g., the average of the frequency ratings for each of the ten negative emotions is used to index Negative Frequency). Negative and positive emotion scales exhibited satisfactory internal consistency (Cronbach's  $\alpha$ s negative = .79 to .84, positive = .76 to .84). Finally, we calculated an Overall Positive Reactivity scale by averaging the Positive Frequency, Intensity, and Duration scores, and an Overall Negative Reactivity scale by averaging the Negative Frequency, Intensity, and Duration scores (both Cronbach's  $\alpha$ s = .88). Thus, the MEQ allows specific aspects of emotional reactivity to be examined separately. We used two versions of the MEQ: one assessing general emotional experiences in the lab using a retrospective self-report format, and one assessing emotions over a two-week period using a daily diary format.

## Procedure

Data used in this study were collected as part of a previous study by Victor and Klonsky (2013) on the specific emotions associated with non-suicidal self-injury (NSSI); however,

the present study includes additional participants and a different focus (i.e., the broad dimensions of emotional experiences in individuals with BPD). Procedures were in accordance with guidelines set forth by the university's Behavioral Research Ethics Board. During the laboratory session, participants provided informed consent, and completed a battery of questionnaires and a semi-structured interview. At the conclusion of this session, the experimenter reviewed coping strategies, and provided a list of community mental health resources and compensation to the participant.

Participants were also invited to complete a daily diary, which included the MEQ, a measure of emotional experiences, for the duration of 14 days. Participants who consented to participate rated their emotions once per day on the MEQ starting on that day. The daily diary measure, which took approximately 5 minutes, was completed from home electronically or on paper shortly before bedtime. A total of 70.7% ( $n = 106$ ) of participants agreed to participate in the diary portion of the study. On average, 11.5 entries ( $SD = 1.9$ ) were completed by each participant. However, of the expected 14 entries, 18.1% were missing, which, though notable, is consistent with other studies using similar procedures in undergraduate populations (e.g., Cummings et al., 2013). Of note, missing data were analyzed and there were no systematic differences between complete and incomplete entries. See Victor and Klonsky (2013) for more details regarding the methodology.

**Statistical Analyses**—To evaluate the first-order relationships between negative and positive emotional experiences and BPD symptoms, we calculated Pearson's correlation coefficients for BPD symptom scores and mean levels of emotion reported retrospectively in the lab. BPD symptoms were correlated with retrospective PANAS-X positive and negative subscales, and retrospective MEQ positive and negative intensity, duration, frequency, and overall emotion scores. Multilevel modeling was used to examine the relationships between BPD symptom scores and mean daily levels of emotion over the 14-day period. Specifically, separate analyses investigated daily diary MEQ positive and negative intensity, duration, frequency, and overall emotion scores. In all models, a random intercept and unstructured covariance matrix were specified, and under fixed-effects, BPD symptoms was entered as the predictor. All analyses were conducted in SPSS 23 using maximum-likelihood estimation.

## Results

### Sample Characteristics

The mean age of the sample was 23.3 years ( $SD = 5.45$ ). Participants were 68% female, 66% Asian, 22% Caucasian, 6.3% Biracial, 2.5% Middle Eastern, 1.3% Hispanic, 1.3% African, and 0.6% First Nations. Although a majority were Asian, there were no significant differences based on ethnicity across any outcome variables of interest. Undergraduate and community participants differed significantly on age ( $p < .001$ ); however, there were no significant group differences on other demographic variables and psychopathology. Participants who completed the daily diary and those who did not were not significantly different with respect to demographic variables and psychopathology.

The mean summed SIDP BPD score for the entire sample was 3.49 ( $SD = 3.64$ ), which is consistent with previous studies of non-clinical populations (Glenn, Weinberg, & Klonsky, 2009). A total of 16.8% of the sample had 2 or more features of BPD ( $n = 27$ ). Based on the DSM-IV-TR criteria, 3.1% of participants ( $n = 5$ ) qualified for a BPD diagnosis (5 or more criteria) while 5.0% ( $n = 8$ ) endorsed subclinical symptoms of BPD (4 criteria). One participant who qualified for a BPD diagnosis, three participants with subclinical symptoms of BPD, and, overall, 15 participants who had 2 or more features of BPD completed the daily diary assessment. Although NSSI and emotional difficulties are both features of BPD, in this sample, 62.7% reported a history of NSSI ( $n = 94$ ), and 25.5% of the individuals endorsing a history of NSSI had two or more features of BPD ( $n = 24$ ). Among participants endorsing a history of NSSI, average age of onset was 12.20 years ( $SD = 5.15$ ), lifetime average number of NSSI episodes was 183.64 ( $SD = 649.89$ ), and average number of NSSI methods was 2.95 ( $SD = 3.07$ ), with the most commonly endorsed methods being picking wounds (41.3%), banging one's head (41.3%), pinching (38.1%), pulling hair (30.6%), scratching (27.5%), biting (26.9%), and cutting (23.8%). The diagnostic breakdown across the lifetime was as follows: 20.6% major depressive disorder, 3.2% bipolar disorder, 28.1% anxiety disorder, 18.8% drug abuse or dependence, and 6.3% eating disorder. 10.6% reported that they were receiving outpatient treatment at the time of participation ( $n = 17$ ) and of this subset, one participant had subclinical features of BPD.

### BPD and Retrospective Emotion Ratings

BPD scores were strongly positively associated with overall negative affect (PANAS-X  $r = .58$ ,  $MEQ r = .55$ ,  $ps < .001$ ), and only weakly negatively correlated with overall positive affect (PANAS-X  $r = -.19$ ,  $p = .02$ ,  $MEQ r = -.18$ ,  $p = .03$ ). With regards to emotional reactivity, higher SIDP BPD ratings were significantly correlated with a higher frequency, greater intensity, and longer duration of negative emotions on the retrospective MEQ (all  $rs = .49$ , all  $ps < .001$ , respectively); this pattern remained even after controlling for positive emotions on the corresponding emotion subscale. BPD scores exhibited small, but statistically significant, correlations with lower frequency ( $r = -.25$ ,  $p < .001$ ) and shorter duration of positive emotions ( $r = -.20$ ,  $p = .01$ ), but did not correlate with the intensity of positive emotions ( $r = -.02$ ,  $p = .80$ ); findings became non-significant after controlling for negative emotions on the corresponding subscale. See Table 1 for summary.

### BPD and Longitudinal Daily Diary Emotion Ratings

Multilevel modeling was used to examine the differences in MEQ emotion ratings across the 14-day diary period (see Table 2). Greater BPD symptoms predicted higher overall negative affect, and higher frequency, greater intensity, and longer duration of negative emotions across the 14-day period. In contrast, BPD symptoms were not significantly related to overall positive affect, and the frequency, intensity, and duration of positive emotions during the study period. Variance in mean overall negative affect and intensity of negative affect within participants across time points was higher than variance in overall positive affect and intensity of negative affect. However, variance in mean duration of positive affect within participants across the study period was higher than variance in the duration of negative affect. Variances in the frequency of negative and positive affect within participants were both similarly high.

## Discussion

This study sought to clarify conflicting views about the nature of emotional disturbances with regards to the valence in individuals with BPD features. Our findings showed that the relationship between (elevated) negative emotions and BPD symptoms is fairly large, and remains large when controlling for positive emotional experiences. In contrast, the relationship between (reduced) positive emotion and BPD symptoms was small, and became non-significant when controlling for negative emotional experiences. This pattern held when examining specific dimensions of negative and positive emotional experience (frequency, intensity, and duration). Further, results were consistent across retrospective and prospective, daily diary reports, which is indicative of the robust nature of the findings. Overall, our results indicate that individuals with BPD symptoms in non-clinical settings primarily experience heightened frequency, intensity, and duration of negative emotionality, while deficits in positive emotion appear to be secondary.

Our study results contrast that of Berenbaum and colleagues (2003) and are in line with previous research indicating that BPD is associated with higher mean levels of negative emotion overall, and negative emotional intensity and frequency, and not notably related to positive emotion (Ebner-Priemer et al., 2007; Kuo & Linehan, 2009; Russell et al., 2007). However, with regards to individual variability in positive and negative emotion, our results were only partially consistent with Russell and colleagues' (2007) findings. Russell and colleagues' (2007) found that overall positive emotion variability was higher than negative emotion variability while our study supports a more nuanced perspective on the within-individual variability of emotion across time. Specifically, our findings imply that although individuals with BPD symptoms do not experience higher overall levels of positive emotions and reactivity, there is significant variability in how long and often they experience positive emotions, and they do not experience notable highs and lows in positive emotion intensity as they do with negative emotions. In contrast to Russell and colleagues (2007), we did not find that overall positive emotions showed greater variability than overall negative emotions. Given that this study did not use a clinical sample, one possibility for the discrepancy may be that there is lower variability in positive emotional reactivity among individuals with less severe symptoms of BPD and perhaps, increased variability in positive emotions is associated with greater symptom severity. However, future studies using a dimensional measure of emotion in a clinical sample will be needed to test this hypothesis.

While our findings suggest that there is little overlap between positive and negative emotional dysfunction, our sample was relatively homogenous, comprised primarily of adults with subclinical or low severity clinical BPD symptoms with only 5 participants reaching the diagnostic threshold of 5 criteria for BPD. As such, it is possible that BPD symptoms in a nonclinical context may be most appropriately conceptualized as related to elevated negative affect, while BPD symptoms in a more clinically severe sample may show different relationships with positive and negative emotion. Moving forward, replication of this study approach in clinical samples that include those who meet full criteria for BPD can help to increase generalizability of the findings and clarify how positive and negative emotions may uniquely influence the prognosis and course of BPD.

Several other limitations should be noted. First, the present study focused on the assessment of the facets of specific emotional experiences, in future studies, the inclusion of an assessment of affective lability would be useful for determining whether individuals with BPD features show the tendency to switch rapidly between emotional states. Additionally, this study used a daily measure of emotion. Future studies using random experience sampling throughout the day may allow us to examine the relative contributions of negative and positive emotional deficits with greater ecological validity. While self-report and daily diary measures represent a crucial part of emotion-related research, employing other techniques, such as facial electromyography measures of muscle activity in corrugator and zygomatic muscle groups may be one route for separately evaluating deficits in negative and positive emotionality, respectively (Cacioppo, Petty, Losch, & Kim, 1986).

Future research targeting potential mediating and moderating factors that may exacerbate or mitigate the emotional difficulties experienced by individuals with BPD, such as thought suppression (Rosenthal et al., 2005) and impulsivity (Tomko et al., 2015), will be useful. Given previous research suggesting that other symptoms of BPD, such as impulsivity, are related to negative emotions specifically (Silbersweig et al., 2007; Tomko et al., 2015), research evaluating whether negative emotion dysfunction may be a common factor that underlies BPD symptoms and diagnosis would have useful implications for treatment. Further, this study was not equipped to determine whether participants were capable of identifying and labelling emotions without distortion and studies assessing third variables that may influence tendencies to overstate or understate emotional experiences would be informative (e.g., environments invalidating emotional expression, social desirability). Finally, future studies manipulating mood using low positive and high negative mood inductions may be another method of examining emotional experiences in BPD.

Existing clinical approaches for addressing symptoms of BPD already address both negative and positive emotional difficulties (e.g., Dialectical Behavior Therapy; Linehan, 1993); our research supports this approach to treatment. However, our findings, should they be replicated by future studies using clinical samples, may provide clarity and specificity to the BPD diagnostic criteria, which may contribute to treatments that more directly target emotional dimensions. Alternatively, our findings may be applied directly in clinical settings. Specifically, clinicians treating individuals with BPD symptoms may benefit from assessing patients' emotional experience on the various dimensions of negative affect and incorporating treatments that target these dimensions.

Despite limitations, to our knowledge, this was the first study to comprehensively evaluate emotional experiences retrospectively and prospectively in individuals with BPD features using a dimensional measure of multiple emotional states. Additionally, our use of daily assessments is ideal for examining affective experiences associated with BPD and enhances the generalizability of our findings. Further, given that BPD is often associated with symptoms of instability in sense of self and periods of dissociation, individuals with severe BPD symptomatology may lack the ability to accurately label their emotions or may invalidate or overstate their emotional experiences (Solhan et al., 2009), which may lead to under- or over-reporting of symptoms. Consequently, our sample, which is relatively high functioning, is advantageous as it allows us to examine self-reported affective symptoms

with greater accuracy and may inform future studies of more severe patients in this population. Ultimately, this study provides evidence that individuals with BPD symptoms experience discrepant levels of positive and negative emotional disturbances and elevated negative emotions should be given primary focus in models of BPD.

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**Table 1**

Correlations and Partial Correlations between Demographics, BPD Symptoms and Emotional Experiences.

Variables	<i>r</i>	<i>p</i>	Partial <i>r</i>	<i>p</i>
<b>Demographics</b>				
Age (years)	-.02	.84	-	-
Gender	-.04	.66	-	-
Total number of diagnoses	.54	<.001	-	-
Lifetime DSM-IV-TR mood disorder	.47	<.001	-	-
Lifetime DSM-IV-TR anxiety disorder	.46	<.001	-	-
Other lifetime DSM-IV-TR Axis I disorder	.26	<.001	-	-
<b>Overall NE</b>				
PANAS-X NE	.58	<.001	.57	<.001
MEQ NE	.55	<.001	.53	<.001
<b>Overall PE</b>				
PANAS-X PE	-.19	.02	-.11	.18
MEQ PE	-.18	.03	.03	.75
<b>MEQ NE Reactivity</b>				
Frequency	.49	<.001	.58	<.001
Duration	.49	<.001	.58	<.001
Intensity	.49	<.001	.59	<.001
<b>MEQ PE Reactivity</b>				
Frequency	-.25	<.001	-.02	.80
Duration	-.20	.01	-.13	.12
Intensity	-.02	.80	-.13	.11

*Notes.* Gender (0 = Male, 1 = Female). NE = negative emotions. PE = positive emotions. PANAS-X = Positive and Negative Affect Schedule-Expanded Form (Watson, Clark, & Tellegan, 1988). MEQ = Multidimensional Emotion Questionnaire (Victor & Klonsky, 2013). Correlations between main study variables and SIDP BPD symptoms were calculated. Partial correlations were computed between BPD symptoms and ratings of emotion while controlling for positive emotions on the corresponding negative emotion subscale (i.e., frequency of negative emotions controlling for intensity of positive emotions) and vice versa (i.e., intensity of positive emotions controlling for intensity of negative emotions). *N* ranged from 92 to 150 due to missing data.

**Table 2**  
**BPD Symptoms and Emotional Experiences Over 14 Days**

Outcome	<i>df</i>	<i>b</i>	<i>F</i>	Residual Estimate	Intercept Variance Estimate
<b>Negative Emotion</b>					
Overall	1, 102	.08	39.75*	.18*	.15*
Frequency	1, 99	.07	26.68*	.24*	.14*
Duration	1, 105	.08	30.24*	.16*	.22*
Intensity	1, 100	.08	36.29*	.28*	.17*
<b>Positive Emotion</b>					
Overall	1, 104	-.02	1.13	.17*	.23*
Frequency	1, 104	-.03	2.58	.24*	.38*
Duration	1, 103	-.01	.98	.18*	.20*
Intensity	1, 103	-.00	.01	.21*	.22*

Notes.

\*  $p < .001$ . Multilevel modeling was used to examine the relationship between BPD symptoms and emotional experiences, which were assessed using the Multidimensional Emotion Questionnaire (Victor & Klonsky, 2013), longitudinally, over the course of the 14-day period. Residual estimates represent the variance in positive and negative emotional ratings within participants across time. Intercept variance estimates represent the variance in positive and negative emotional ratings between participants. *N* ranged from 100 to 106 due to missing data.