# Emotional awareness, affective dysregulation, and bipolar spectrum psychopathology: A path analysis

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## Abstract:

Affective dysregulation is present in those with subsyndromal symptoms of hypomania and mania and prospectively predicts the development of bipolar spectrum disorders. A crucial, understudied area related to the experience and regulation of emotion in this population is emotional awareness – emotional clarity (Clarity) and attention to emotion (Attention). We examined whether scores on the Hypomanic Personality Scale (HPS) were associated with deficits in emotional awareness and whether these deficits were associated with heightened intensity and instability of negative (NA) and positive affect (PA). Young adults (n=233), oversampled for high HPS scores completed self-reports and 14 days of experience sampling assessing high and low arousal NA and PA. HPS scores were associated with low Clarity and unassociated with Attention. High HPS scores were associated with greater high and low arousal NA intensity and instability only for those at low and mean levels of Attention. In contrast, there was a significant indirect association between HPS scores and intensity of high and low arousal NA and PA, as well as instability of high arousal NA, through low Clarity. Results highlighted that individual differences exist in the extent to which facets of emotional awareness differentially link scores on the HPS to emotional outcomes.

**Keywords:** Emotional Awareness | Emotional Clarity | Attention to Emotion | Bipolar Psychopathology | Hypomanic Personality Scale | Emotion Instability

## Article:

### Introduction

Bipolar spectrum psychopathology refers to a range of trait-like and episodic disruptions in the experience of emotion, cognition, and behavior that encompasses both clinical and subclinical manifestations of mania and hypomania (Kwapil et al., 2011; Sperry and Kwapil, 2017). Assessment of this wider phenotype is important for understanding heterogeneity in symptom presentation, impairment across varying levels of symptoms, and for prospectively identifying those who may be at greater risk for the development of bipolar disorders. The Hypomanic Personality Scale (Eckblad & Chapman, 1986) is a self-report questionnaire developed to provide dimensional ratings of bipolar spectrum psychopathology with up to 77% of high scorers (>1.5

SD) reporting a lifetime history of a hypomanic episode (Eckblad & Chapman, 1986). Higher scores on the HPS are associated with subclinical and clinical symptoms of mania/hypomania in daily life (e.g., inflated self-esteem, energetic-enthusiasm; Kwapil et al., 2011; Sperry and Kwapil, 2017, Walsh et al., 2012) and prospectively predict the development of new cases of bipolar disorders both three and ten years later (Kwapil et al., 2000; Walsh et al., 2015). A growing body of work highlights that scores on the HPS, even in non-clinical samples, are also associated with greater affective instability and heightened mean levels of negative and positive affect in daily life (Sperry and Kwapil, 2019, Sperry and Kwapil, 2020;Sperry, Walsh, & Kwapil, 2020).

Emotion dysregulation is a core feature of bipolar spectrum psychopathology with greater affective instability associated with worse outcomes (e.g., greater severity of episodes, increased number of hospitalizations, co-occurring substance use; Angst et al., 2003; Henry et al., 2001, 2008; Prisciandaro et al., 2018). In addition, greater instability of mood in a non-clinical sample oversampled for high HPS scores predicted the development of new onset bipolar spectrum disorders over a three-year follow-up period (Sperry, Walsh, & Kwapil, 2020). Thus, a greater understanding of the experience and regulation of emotion in those displaying various levels of bipolar spectrum psychopathology is warranted and may help identify targets for preventative interventions for those at risk for the development of bipolar spectrum disorders or therapeutic interventions for those who have already developed the disorder.

Trait emotional awareness, one's cognitions about their emotions and their ability to identify and label emotions (Boden & Thompson, 2017; Gohm & Clore, 2000; Thompson et al., 2009), is an important aspect of the experience and regulation of emotion that has not yet been studied in the context of bipolar spectrum psychopathology. The Affect-as-Information hypothesis posits that people's judgements and understanding of their emotions influences their experience of emotion, decision-making, and the value they place on their affective response (Gohm & Clore, 2002; Schwarz & Clore, 1983). Accordingly, individuals who do not value, attend to, or understand their emotions may not benefit from the information that affect can provide. In terms of trait emotional awareness, people vary in their emotional clarity (Clarity), the extent to which they understand, perceive, and describe their emotions (Gohm & Clore, 2000; Thompson et al., 2009), and attention to emotion (Attention), the extent to which they attend to, monitor, and value their emotions (Gohm & Clore, 2000). Clarity and Attention are distinct, modestly correlated phenomenon (see Boden & Thompson, 2017 for meta-analysis) and have been widely studied in the context of psychopathology and emotion dysregulation (e.g., Vine & Aldao, 2014).

### *1.1. Emotional Clarity*

Both theoretical and empirical work suggests that low levels of Clarity may result in disruptions in the experience of emotion. Specifically, low Clarity has been linked to greater momentary affect intensity (Boden et al., 2013) and instability (Thompson et al., 2009). Successful identification and labeling of affective responses should enable an individual to better understand and manage their emotions (Barrett et al., 2001; Kashdan et al., 2015; Lieberman, Inagaki, Tabibnia, & Crockett, 2011; Vine & Aldao, 2014). As such, those characterized by low Clarity require the use of more cognitive resources to understand their current affective state and as a result have less successful emotion regulation (Ellis & Ashbrook, 1988; Gohm & Clore, 2000). Specifically, when an individual lacks Clarity, they may be more likely to engage in avoidant coping skills which in turn is associated with greater intensity of negative affect (NA; Neumann et al., 2017). Likewise, Thompson and colleagues (2009) suggest that low Clarity is associated with greater variability of affect which may inhibit adaptive antecedent-focused emotion regulation.

Low Clarity has also been widely linked to various forms of psychopathology (Vine & Aldao, 2014) and affective disorders including depressive episodes and diagnoses (Ehring et al., 2008; Loas et al., 1998; Thompson et al., 2017; Thompson et al., 2015) and bipolar I disorder (Van Rheenen et al., 2015). Although no studies to our knowledge have examined the association of Clarity and broader bipolar spectrum phenotypes (e.g., using HPS scores), there has been work linking disruptions in Clarity to disruptions in aspects of the Behavioral Activation System (BAS) (e.g., dysregulated reward sensitivity and goal pursuit), which are known to underlie bipolar spectrum disorders (Edge et al., 2013; Johnson, 2005; Johnson et al., 2012; Johnson et al., 2000). For example, adolescents with BAS risk for bipolar disorders were characterized by low Clarity and increased depressive symptoms (Stange et al., 2013). Merchán-Clavellino et al. (2019) examined the links between BAS, Clarity, and PA and found that Clarity mediated the association of sensitivity to reward and PA. Thus, we hypothesized that bipolar spectrum psychopathology, as indexed by higher scores on the HPS, would be associated with low levels of Clarity (H1) and that there may be a significant indirect relationship between HPS scores and affect intensity and instability through low levels of Clarity (H2).

### *1.2. Attention to Emotion*

Theoretical work attempting to elucidate the links between Attention and the experience of emotion suggest that their links may depend on the levels of Attention one experiences. The Affect-as-Information hypothesis suggests that the association between affect and judgment should be stronger for those with greater Attention (Schwarz & Clore, 1983) such that individuals low in Attention may not value their affective response and are less likely to learn from it (Gohm & Clore, 2002). This could potentially indicate that low levels of Attention would be associated with greater affective instability. Furthermore, the hedonic contingency hypothesis posits that individuals' level of Attention may influence their motivation to remain in the same mood state (Wegener & Petty, 1994; Wegener et al., 1995). Specifically, they report that the more one attends to PA, the more likely they are to ignore mood-incongruent cognitive messaging in an effort to sustain high levels of PA. Theoretically, this model suggests individuals with high Attention may display less affective instability given that they are more likely to remain in the same mood state. Interestingly, at the momentary level, higher Attention has been linked with greater NA concurrently leading initial thoughts that high Attention may be associated with poor emotion regulation; however, higher Attention prospectively predicted greater decreases in NA at future assessment points (Thompson et al., 2011). These results highlight the possibility that those high in Attention may more successfully down-regulate emotion over time and that the function of Attention at trait vs. state levels and across different timescales may be varied.

Some studies find positive associations between Attention with psychopathology (Salovey et al 2002; Huang et al., 2013), some find negative associations (Salovey et al., 1995), and some find no associations (e.g., Salovey et al., 2002; Boden and Thompson, 2015; Van Rheenen et al., 2015). We hypothesized that bipolar spectrum psychopathology, as measured by the HPS, would be associated with high levels of Attention (H3). Specifically, we hypothesized that HPS scores would be associated with higher Attention as patients with bipolar disorder have an attentional bias towards both negative and positive stimuli independent of mood-episodes (Alloy et al., 2006; García-Blanco et al., 2014). Given that prior work suggests distinctions between high vs. low levels of attention with the experience of emotion, we hypothesized that levels Attention may moderate the association between HPS scores and greater affect intensity and instability (H4).

### *1.3. Goals & hypotheses*

It is clear that trait emotional awareness plays an important role in psychopathology, and further, that trait emotional awareness influences the experience of emotion. Specifically, trait emotional awareness has been linked to both trait and state affect intensity and instability. Despite this, theoretical models of emotion dysregulation across the bipolar spectrum have failed to consider the role of trait emotional awareness in affective dysregulation. Thus, the overall goal of this study was to examine the role that trait emotional awareness plays in the association between bipolar spectrum psychopathology, as measured by the HPS, and affective intensity and instability. Importantly, we employed novel methods (experience sampling methodology; ESM) and statistical methods (time-series analysis) to assess affect intensity and instability in daily life.

We had several a priori hypotheses that were pre-registered at Open Science Framework (osf.io/xjnfd). In our initial pre-registration, we hypothesized that higher HPS scores would be associated with low Clarity and high Attention and that Attention and Clarity would moderate the association of HPS scores with affect intensity and instability1. Between pre-registration and the completion of this project, an updated review of both theoretical and empirical literature led us to revise our hypotheses. Specifically, we hypothesized that Attention and Clarity would have differential relationships with the path between HPS scores and affect intensity and instability. Based on work of Merchán-Clavellino et al. (2019), we hypothesized that high HPS scores may be associated with heightened affect intensity and instability through low Clarity whereas this relationship would depend on different levels of Attention. As such, we ran a series of exploratory path models that tested the direct pathways between HPS scores with Clarity (H1: pre-registered) and Attention (H3: pre-registered), whether Attention moderated the path between HPS scores and affective intensity and instability (H4: pre-registered), and whether there was a significant indirect pathway between HPS scores, Clarity, and affective intensity and instability (H2: exploratory). Given that Gohm and Clore (2000) originally proposed the idea that valence denotes value and arousal denotes importance, we tested each hypothesis in both high and low arousal NA and PA.

## 2. Methods

### *2.1. Open science statement*

Following open science guidelines, we have made the data and analysis scripts associated with this report publicly available on Open Science Framework (https://osf.io/xjnfd). All hypotheses are identified as either pre-registered a priori or exploratory.

### *2.2. Participants*

This study was part of a larger study (Sperry & Kwapil, 2020) that examined daily life expression of emotion dynamics in bipolar spectrum psychopathology. A total of 352 young-adults from a large Midwestern university participated. Usable data was available for 233 participants (MAGE = 18.8, SDAGE = 1.0, self-identified as 71% female, 29% male, 52% White, 22% Asian, 13% Black/African American, 11% Multiracial, 1% American Indian, 1% Native Hawaiian). Note that this sample size was determined a priori using Monte Carlo Simulations based on preliminary data and was sufficient to detect small direct effects between level 1 and 2 variables with 80% power (Heck & Thomas, 2015; Muthén & Muthén, 2010; Sperry & Kwapil, 2020). Detailed information regarding those dropped from analyses are presented in supplemental materials. Note that participants were recruited through two methods. First, undergraduates taking psychology courses could enroll into the study for course credit. Second, participants who scored 1.5 SD's above the mean on the HPS administered during departmental pre-screening were invited to participate. This recruitment method ensured adequate inclusion of participants experiencing high levels of bipolar spectrum psychopathology. Note that college students provide an appropriate sample for studying trait emotional awareness in bipolar spectrum psychopathology as they are at the age that bipolar disorders often first are experienced and the HPS effectively identifies young adults with bipolar symptoms and risk for bipolar disorders (e.g., Walsh et al., 2015). Participants who completed at least 70% of the ESM questionnaires were entered into a drawing for a $100 gift card. The study was approved by the Institutional Review Board and all participants provided informed consent.

### *2.3. Procedures*

Participants came to the lab for a one-hour session during which they completed self-report questionnaires and were instructed on ESM procedures. Participants completed a practice ESM survey (not included in analyses) using either the ESM Smartphone application Metricwire or Expimetrics. Participants were randomly prompted eight times per day between the hours of 10am and 10pm within stratified 90-minute intervals for 14 days. They had 10 minutes to complete questionnaires once they received notification that a questionnaire was available. The questionnaire took approximately two minutes to complete. In order to enhance participant compliance and motivation to complete ESM questionnaires and to troubleshoot problems, they were required to return to the lab for two follow-up sessions, once during the first 7 days and once during the second 7 days.

### *2.4. Materials*

Participants completed self-report measures of risk for bipolar spectrum psychopathology, Clarity, Attention, infrequent responding, and demographics, as well as several other self-report measures not included in the present study.

#### *2.4.1. Hypomanic Personality Scale*

The HPS is a well-validated measure that assesses bipolar spectrum psychopathology and risk for the development of bipolar spectrum disorders. High scorers on the HPS are at greater risk for the development of bipolar spectrum disorders (Kwapil et al., 2000; Walsh et al., 2015) and are significantly more likely to have subsyndromal symptoms of mania and hypomania. Several longitudinal studies have found that 33% - 78% of high scorers on the HPS have had a hypomanic episode (Eckblad & Chapman, 1986) and that high scorers are more likely to develop a bipolar spectrum disorder at both three (Walsh et al., 2015) and ten-year reassessments (Kwapil et al., 2000). The HPS includes 48 true-false items, has good internal consistency and test-retest reliability (Eckblad & Chapman, 1986). The HPS was intermixed with a 13-item infrequency scale

(Chapman & Chapman, 1983) designed to identify invalid responders. Participants who endorsed more than two items were excluded from analyses.

### *2.4.2. Clarity and Attention*

Clarity and Attention were measured using the Trait Meta-Mood Scale (TMMS; Salovey et al., 1995). Participants reported responses on a Likert scale ranging from "1: Strongly disagree" to "5: Strongly agree." The Clarity subscale contains 11 items (e.g., "I am rarely confused about how I feel") and the Attention subscale includes 13 items (e.g., "I don't usually care much about what I'm feeling" [reverse-scored], "I pay a lot of attention to how I feel"). In three samples, the coefficient alpha internal consistency reliability ranged from .82 to .87 for the Attention subscale, and .85 to .87 for the Clarity subscale (Thompson et al., 2009).

### *2.4.3. NA and PA Intensity and Instability*

Affect items were drawn from the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) and the affective circumplex (Russell, 1980). Specifically, we assessed high arousal NA with the following affect items: "angry", "nervous", "irritable", "afraid"; low arousal NA: "sad", "bored", "sluggish"; high arousal PA: "enthusiastic", "determined", "proud", "excited"; low arousal PA: "content", "calm." Participants were asked to respond to the item "Right now, I feel [affect]" using a 7-point Likert scale ranging from 1: not at all to 7: very much. High and low arousal NA intensity represented the average of the NA indices and high and low arousal PA intensity represented the average of the PA indices over the 14-day protocol (this resulted in four intensity values per participant). Means and within and between person reliability, calculated using McDonald's omega (ω; Zinbarg et al., 2005) are presented in Table 1. Next, we calculated the Mean Square of Successive Differences (MSSD) for each participant. Following, Jahng, Wood, & Trull (2008), we adjusted successive differences for unequally spaced time (see Formula 1). Lambda was chosen to account for serial effects and make successive differences as constant as possible. Finally, we took the square root of MSSD values (RMSSD) to account for non-normality.

$$RMSSD = \sqrt{\frac{1}{N-1} \sum_{i=1}^{N-1} \left( \frac{x_{i+1} - x_i}{\left[ \frac{t_{i+1} - t_i}{Mdn(t_{i+1} - t_i)} \right]^{\lambda}} \right)^2},$$

Where Mdn = 5,820 seconds. λ for High Arousal NA =.0000053, λ for Low Arousal NA = .000048, λ for High Arousal PA = .0000014, λ for Low Arousal PA = .0000012.

**Table 1.** Descriptive Statistics and Correlations

| | Mean (SD) | Skew | Kurtosis | ω | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. HPS | 21.02 (7.84) | .1 | -.41 | .85 | | | | | | | | | | |
| 2. Clarity | 33.87 (7.59) | -.2 | -.46 | .89 | -.22** | | | | | | | | | |
| 3. Attention | 49.57 (7.97) | -.88 | 1.03 | .85 | -.02 | .12 | | | | | | | | |
| 4. HA $NA_{intensity}$ | 2.10 (.80) | .77 | .29 | .68/.91 | .19** | -.32** | -.05 | | | | | | | |
| 5. LA $NA_{intensity}$ | 2.66 (.83) | .41 | .33 | .48/.79 | .07 | -.32** | -.01 | ***.82**** | | | | | | |
| 6. HA $PA_{intensity}$ | 3.08 (.98) | .33 | .16 | .71/.93 | .29** | .13* | .07 | .11 | .09 | | | | | |
| 7. LA $PA_{intensity}$ | 4.20 (.92) | .04 | .43 | .65/.89 | -.03 | .33** | .06 | **-.40**** | **.37**** | **.42**** | | | | |
| 8. HA $NA_{RMSSD}$ | .94 (.38) | .55 | .32 | – | .23** | -.24** | .05 | ***.62**** | **.48**** | .13 | -.16* | | | |
| 9. LA $NA_{RMSSD}$ | 1.15 (.33) | .31 | .12 | – | .19** | -.15* | .03 | **.31**** | **.34**** | .01 | -.04 | ***.68**** | | |
| 10. HA $PA_{RMSSD}$ | 1.14 (.41) | .57 | .04 | – | .15* | .06 | .02 | -.06 | -.13* | .27** | **.30**** | **.41**** | ***.55**** | |
| 11. LA $PA_{RMSSD}$ | 1.39 (.44) | .36 | -.16 | – | .01 | .00 | .13* | .10 | .05 | -.04 | .10 | ***.57**** | ***.63**** | ***.57**** |

Note. RMSSD = Root Mean Square Successive Differences. Medium effect sizes are bold, large effect sizes are bold and italicized. ω ¼ McDonald's Omega internal reliability within/between. HA = High Arousal; LA = Low Arousal.
*$p < .05$; **$p < .01$; ***$p < .001$.

### *2.5. Statistical analyses*

We conducted path analyses in R version 4.0.2 using lavaan (Rosseel, 2012). Figures 1- 4 show the path models we tested. For each model, we used the HPS score as the exogenous variable with the emotional outcome (intensity or instability) as an endogenous variable. Paths were also specified from the HPS to Clarity and Attention and from Clarity and Attention to the emotional outcome. Following the hypothesized model, we specified that Attention would moderate the link between the HPS and emotional outcome. We also estimated the indirect path from the HPS to the emotional outcome through Clarity. Standard errors were calculated based on 1000 bootstrapped samples. Finally, models were estimated using full information maximum likelihood (FIML). We evaluated model fit using CFI, RMSEA, and SRMR based on Hu and Bentler (1999) criteria.

We computed simple slopes analyses to decompose significant interactions by examining whether the slope between HPS scores and affect intensity or instability were significant at low (-1 SD), mean (0), or high (+1 SD) levels of Attention.

## 3. Results

Participants completed an average of 63% (n=35) usable ESM protocols during the first week and 61% (n = 34) during the second week. Total number of completed ESM questionnaires was not significantly associated with HPS scores ($r = .04$, $p =.60$), Clarity ($r = -.03$, $p = .65$), or Attention ($r = -.02$, $p = .71$). Descriptive statistics and zero-order correlations for all variables are presented in Table 1. Twenty-six percent (n = 60) of participants had scores in the upper quartile on the HPS (27 to 48). Based on prior research, it is expected that concurrently, 15% of the sample (n = 35) would meet criteria for a DSM bipolar spectrum disorder and 20% likely have a lifetime history of a hypomanic episode. Additionally, we would expect that prospectively over three years, approximately 58% of those scoring in the upper quartile at baseline would meet criteria for a diagnosable bipolar spectrum disorder (Walsh et al., 2015). Thus, oversampling procedures were viewed as successful and the current sample is enriched with those who likely have or will develop a bipolar spectrum disorder. Across zero-order correlations and all path models, higher HPS scores were associated with lower Clarity, providing support for hypothesis 1. However, HPS scores were not significantly associated with Attention (i.e., hypothesis 3 was not supported).

### *3.1 Intensity Models*

All four models predicting high and low arousal NA and PA intensity had good fit (CFI = .95 – .96, RMSEA = .05, SRMR = .03). As predicted (H2), we found that the indirect path (labeled d*b in Figure 1) was significant in predicting high and low arousal NA intensity (Table S3; Figure 1). Furthermore, the indirect path through Clarity also predicted high and low arousal PA intensity (Table S4 ; Figure 2). Also, as predicted (H4), we found that the HPS*Attention interaction significantly predicted high arousal NA intensity (Table S3; Figure 1) at low levels of Attention, $t(229) = 4.05$, $p < .001$, and at mean Attention, $t(229) = 2.76$, $p = .006$, but not high levels, $t(229) = -.04$, $p = .97$. We also found that HPS scores were associated with greater low arousal NA at low levels of Attention, $t(229) = 2.29$, $p = .02$, but not mean, $t(229) = .85$, $p = .40$, or high Attention, $t(229) = -.95$, $p = .34$. Attention did not moderate the association between HPS scores and intensity of high or low arousal PA (Table S4; Figure 2).

### *3.2. Instability Models*

Models predicting high and low arousal NA and high arousal PA instability had good fit (CFI = .90 – .95, RMSEA = .05, SRMR = .03) with the low arousal PA instability model showing adequate fit (CFI = .87, RMSEA = .05, SRMR = .03). The indirect path between HPS scores and instability of high arousal NA (but not low arousal NA) through Clarity was significant (Table S5; Figure 3). The indirect paths between HPS scores and instability of high and low arousal PA through Clarity were not significant (Table S6; Figure

4).2 Partial support was seen for H4 – Attention significantly moderated the association between HPS scores and instability of both high and low arousal NA (Table S5, Figure 3). Simple slopes analyses revealed that HPS scores were associated with greater high arousal NA instability for those low in Attention, $t(229) = 4.34$, $p < .001$, and at mean levels of Attention, $t(229) = 3.23$, $p = .001$, but not those high in Attention, $t(229) = .44$, $p = .66$ (Figure 5). Likewise, HPS scores were associated with greater low arousal NA instability for those low in Attention, $t(229) = 4.06$, $p < .001$ and those at mean levels of Attention, $t(229) = 2.71$, $p = .007$, but not those high in Attention, $t(229) = -.12$, $p = .90$. Attention did not moderate the association of HPS scores with instability of PA (Table S6, Figure 4).

## 4. Discussion

Clarity and Attention showed differential mechanistic relationships with risk for bipolar spectrum psychopathology, as measured by the HPS, and affect intensity and instability. HPS scores predicted greater high and low arousal NA only when participants had low or mean trait levels of Attention. A similar pattern emerged for instability – HPS scores predicted greater high and low arousal NA only when participants had low or mean trait levels of attention, consistent with the Affect-as-Information hypothesis. Attention did not seem to be related to PA in daily life. In contrast, the association between HPS scores and intensity of both high and low arousal NA and PA was partially accounted for by their indirect relationship with low levels of Clarity. More specificity was seen in terms of instability – HPS scores were associated with low Clarity which in turn was associated with higher instability of high arousal NA. Based on these results we highlight three major implications and areas of future study: (1) assessing trait emotional awareness in those at risk for bipolar spectrum psychopathology is important, (2) facets of emotional awareness are differentially associated with affect intensity and instability in daily life, and (3) targeting emotional awareness in psychosocial interventions may improve affective dysregulation in those with subsyndromal symptoms.

### *4.1. Clarity*

We extended Van Rheenen et al.'s (2015) study in bipolar I disorder to find that high HPS scores were associated with low trait Clarity. This suggests that low trait Clarity may be present across a wide spectrum of bipolar psychopathology and in those at risk for the development of bipolar spectrum disorders. Furthermore, trait Clarity was negatively associated with high and low arousal NA and positively associated with high and low arousal PA suggesting that on average, individuals low in trait Clarity may fail to down-regulate emotions and experience higher intensity of NA and lower intensity of PA. This is consistent with findings that suggest that identifying one's emotions functions to regulate their intensity (e.g., Torre & Lieberman, 2018; Lieberman et al, 2011).

Alternatively, it could be that higher affect intensity could lead to less Clarity. For example, Arndt et al. (2018) found that indirect (reaction time) measures of Clarity in daily life were associated with intensity in an inverted U pattern (i.e., both linearly and quadratically) whereby intense affect was needed for someone to be clear about their emotions, and, higher intensity of affect was associated with greater confusion about one's emotion. Although we measured Clarity at the trait not state level, the alternate model we tested in which intensity predicted Clarity had poorer model fit. As such, the relationship between Clarity and affect intensity may depend differentially on state vs. trait Clarity, particularly in those at risk for the development of bipolar spectrum disorders. One potential factor influencing differences between state and trait Clarity is one's confidence in their emotion ratings (Arndt et al., 2018). Interestingly, a core feature of bipolar spectrum psychopathology is increased confidence with HPS scores positively associated with self-reported confidence in daily life (Kwapil et al., 2011; Sperry & Kwapil, 2017). Individuals may endorse high trait Clarity during periods of grandiosity but have less accuracy in labeling their emotions. This will be an important future direction of this work in expanding it to both clinical populations and measuring emotional awareness at both trait and state levels.

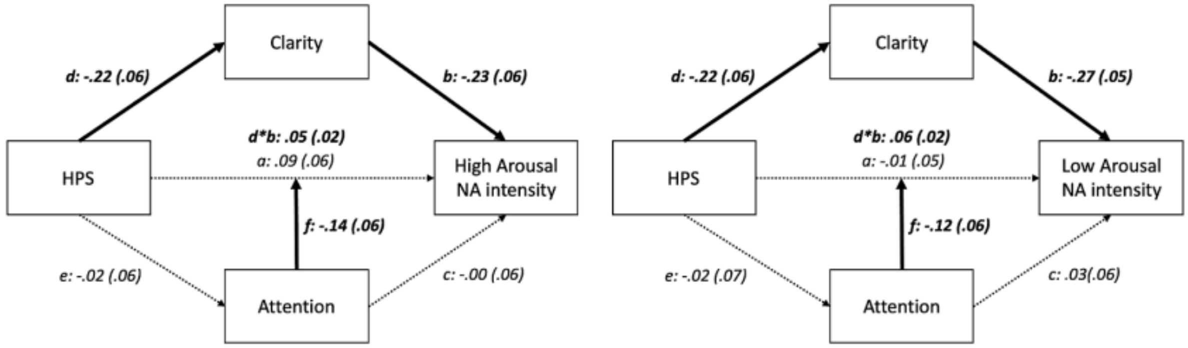


**Figure 1.** Path Models for Intensity of High and Low Arousal NA. Note. The estimate and standard error of each path are presented. Significant paths are indicated with solid black lines and bolded coefficients. Non-significant pathways are indicated with lighter dashed lines. The indirect path is represented by the d*b pathway.

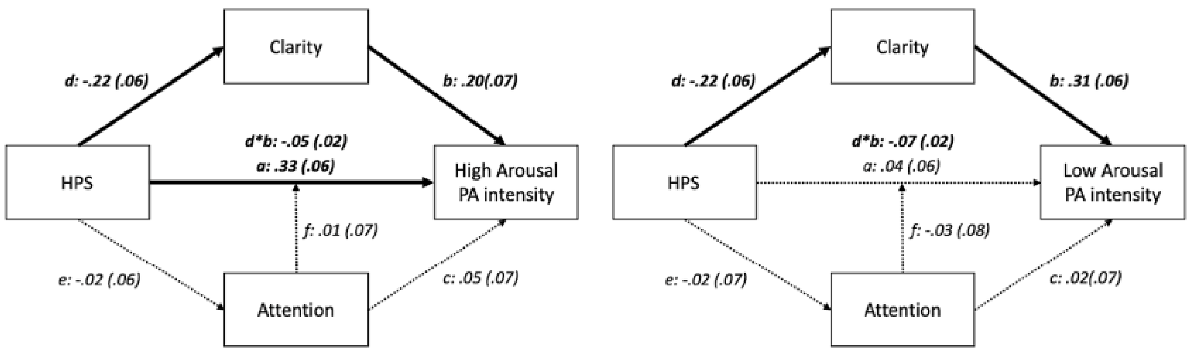


**Figure 2.** Path Models for Intensity of High and Low Arousal PA. Note. The estimate and standard error of each path are presented. Significant paths are indicated with solid black lines and bolded coefficients. Non-significant pathways are indicated with lighter dashed lines. The indirect path is represented by the d*b pathway.

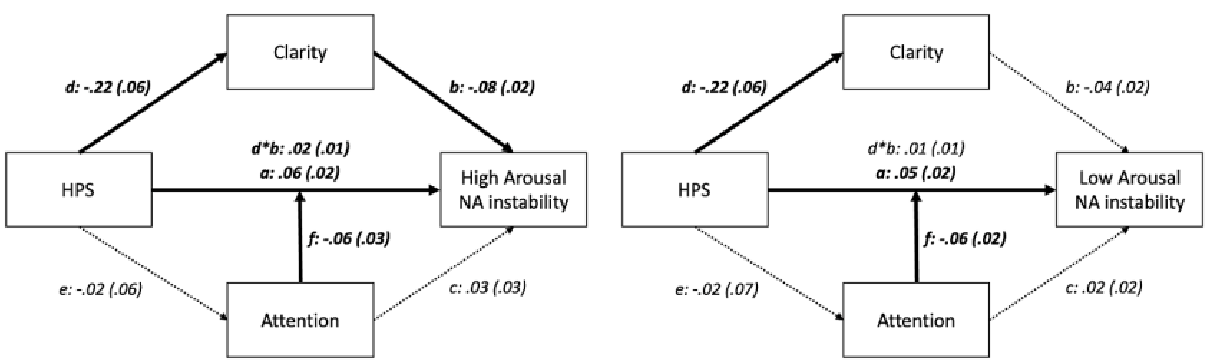


**Figure 3.** Path Models for Instability of High and Low Arousal NA. Note. The estimate and standard error of each path are presented. Significant paths are indicated with solid black lines and bolded coefficients. Non-significant pathways are indicated with lighter dashed lines. The indirect path is represented by the d*b pathway.

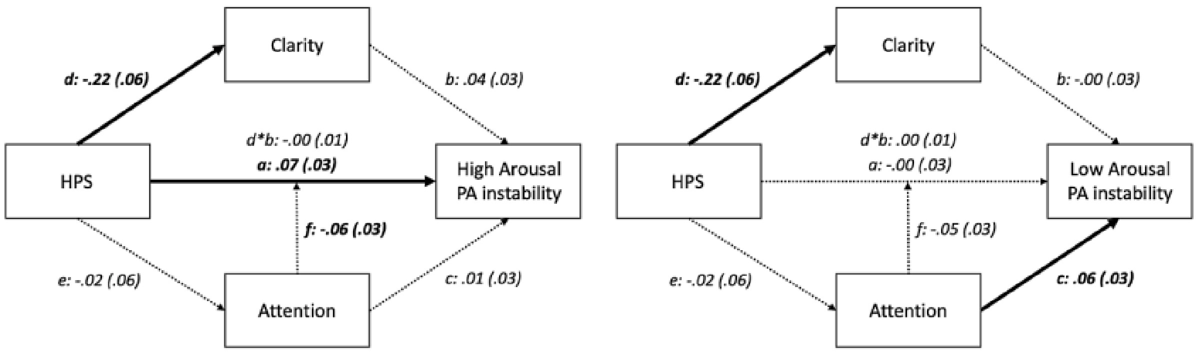


**Figure 4.** Path Models for Instability of High and Low Arousal PA. Note. The estimate and standard error of each path are presented. Significant paths are indicated with solid black lines and bolded coefficients. Non-significant pathways are indicated with lighter dashed lines. The indirect path is represented by the d*b pathway.

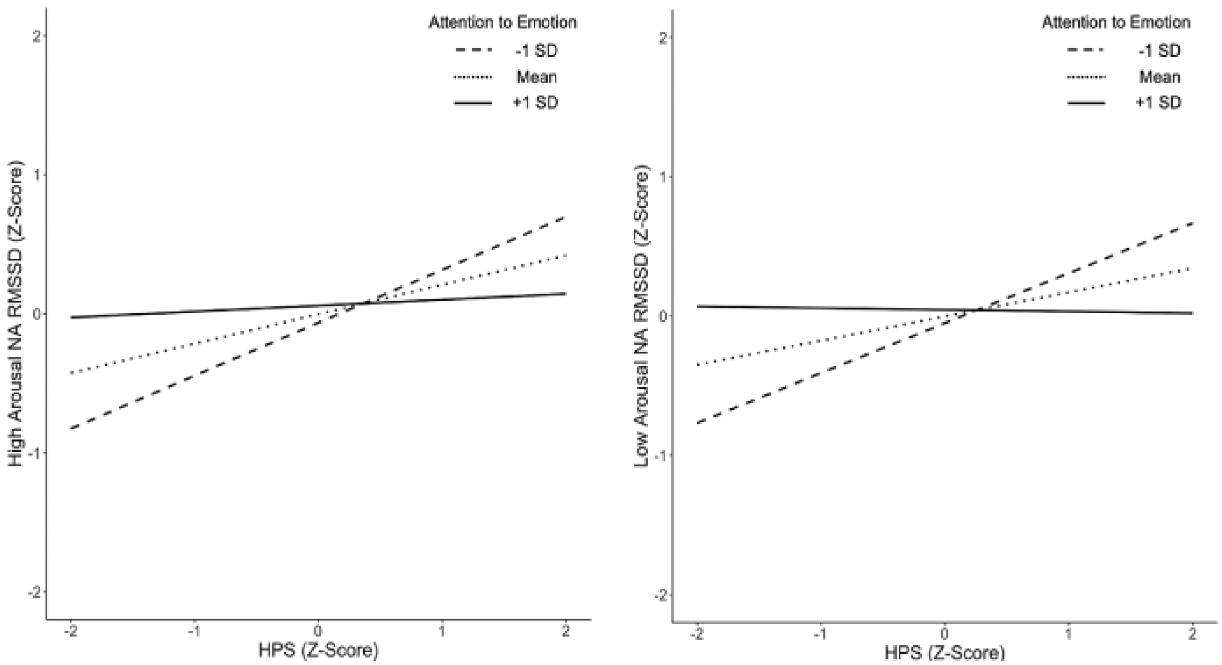


**Figure 5.** Attention to Emotion Moderates the Association of HPS and NA Instability. Note. Attention was measured continuously but for the purposes of displaying simple slopes analyses, low Attention was classified as -1 SD, mean as 0 SD, and high as +1 SD.

Our finding that the indirect path between HPS scores and instability of high arousal NA is consistent with Boden et al. (2013)) findings regarding variability of NA and PA – Clarity was associated with variability of NA but not PA. Yet, in the present study, this was only true in high arousal not low arousal NA. Muhtadie and Johnson (2015) found that participants with bipolar disorder showed greater patterns of cardiovascular threat reactivity during a cognitive task. Our high arousal NA measure included subjective feelings of fear and anxiety – core components of threat sensitivity. This may suggest that higher scores on the HPS may be particularly associated with low clarity of threat-related negative emotions which in turn leads to difficulty regulating the intensity of these category of emotions. Furthermore, Storbeck and Clore (2008) posit that high vs. low arousal emotions provide information about the importance of one's situation. Thus, individuals scoring high on the HPS may be having difficulty integrating the importance of their high arousal NA into the current context and thus may not engage in emotion regulation strategies appropriately.

### *4.2 Attention*

Contrary to expectations, but consistent with Van Rheenan et al. (2015), HPS scores were unassociated with levels of Attention at both the zero-order level and in the path analysis. This suggests that in general, individuals with varying levels of risk for bipolar spectrum psychopathology do not show trait-level alterations in the ability to monitor, value, and maximize their experience of emotion. However, we found that under specific conditions (low, mean Attention), HPS scores were associated with NA intensity. These findings are consistent with the Affect-as-Information (Gohm & Clore, 2002) and hedonic contingency hypotheses (Wegener et al., 1995) that suggest that low levels of attention may impair emotion regulation leading to greater affect intensity and higher instability of affect. Furthermore, Thompson et al. (2011) found that concurrently, higher Attention was associated with greater intensity of NA and PA, but that attention predicted reductions in NA in next moment. Taken together with our results, this may suggest that higher Attention is associated with greater intensity of emotion in the moment (perhaps because intensity of emotion is signaling to the person that there is something important and valuable that they need to attend to), but that this enables the individual to successfully regulate the intensity of their emotions over time. This would explain why Thompson et al. (2011) found prospective decrease in NA and why at trait levels, those who do not attend to their emotion (and have risk for psychopathology) have more affective dysregulation over time. Perhaps individuals with high scores on the HPS and low trait Attention fail to monitor and attend to changes in the intensity of their emotions, subsequently failing to engage antecedent-focused emotion regulation strategies and learn from their environment. Never-the-less, rather than being proximal to various forms of psychopathology, Attention seems to be a more distal factor influencing the experience of emotion in the moment.

### *4.3 Implications*

Taken together, these results clearly implicate a relationship between HPS scores, Clarity and Attention, and affective dysregulation. As such, it is essential that in those identified as at risk for the development of bipolar spectrum disorders (e.g., high scorers on the HPS, high BAS participants, first-degree relative with bipolar disorder), trait emotional awareness is assessed. Given that affective instability and dysregulation is a risk factor for the development of bipolar spectrum disorders (e.g., Sperry et al., 2020), it could be especially important to engage at risk individuals in emotional awareness training aimed at decreasing affect intensity and instability. Preliminary trials have shown that dialectical behavior therapy, which directly addresses Clarity and Attention, may be helpful in reducing emotion dysregulation in those with bipolar disorders (Eisner et al., 2017; Goldstein et al., 2007; Goldstein et al., 2015; Van Dijk et al., 2013). Thus, individuals identified as high risk based on psychometric risk assessments may benefit from early intervention to a) monitor and attend to feelings in reaction to an external or internal stimulus, and b) accurately make attributions about the source and type of emotions they feel could potentially decrease affect intensity and instability.

### *4.4 Limitations and Future Directions*

This study was not without limitations. First, although affect intensity and instability were modeled longitudinally over 14 days, the HPS, Clarity, and Attention were modeled cross-sectionally. Thus, path models should not be interpreted causally as they do not temporal dependency. However, it is worth noting that in reversing the models, theorized models had better fit suggesting some support for directionality. Future studies could more concretely speak to causality and directionally should variables be temporally ordered, or, experimentally manipulated. Second, Attention, as measured by the TMMS, appeared largely unrelated to PA outcomes. This was somewhat surprising given that Thompson et al. (2011) found that Attention was associated with momentary intensity of PA. Future work is warranted to disentangle whether Attention is unrelated to PA, or, the measure itself does not adequately tap attention to PA. Lastly, it is unclear whether these findings generalize to patients with clinically diagnosed bipolar spectrum disorders. The present study examined a non-clinical sample oversampled for high scores on the HPS. However, in previous studies, high HPS scorers had a high likelihood of having experienced a hypomanic episode, may already have diagnosable bipolar disorders, and are more likely to go on to develop a bipolar spectrum disorder (Kwapil et al., 2000; Walsh et al., 2015). Furthermore, assessing affective instability in a population that is potentially naïve to medication side effects is a benefit, as first-line treatments such as Lithium are known to reduce affective instability (Hollander et al., 2005). However, the present study did not include a diagnostic interview that assessed diagnostic or medication status, so this information is unknown. Future studies should examine the extent to which state levels of Clarity and Attention are different than trait levels across various mood presentations and account for medication usage. For example, findings regarding the link between Attention and affect intensity and instability may look different in an individual who is actively hypomanic or manic and on or off mood stabilizers.

**CRediT authorship contribution statement**

**Sarah H. Sperry:** Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Writing - review & editing, Project administration. **Nathaniel S. Eckland:** Formal analysis, Visualization, Writing - original draft, Writing - review & editing, Project administration. **Thomas R. Kwapil:** Conceptualization, Methodology, Supervision, Resources, Writing - review & editing.

**Duration of Competing Interest**

Sarah H. Sperry, Nathaniel S. Eckland, and Thomas R. Kwapil have no conflicts of interest to report.

**Supplementary materials**

Supplementary material associated with this article can be found, in the online version, at doi: 10.1016/j.psychres.2021.113739.

**Notes**

1 Results of original pre-registered a priori hypotheses are provided at the OSF page: osf.io/xjnfd

2 Path models were tested based on the theorized ordering of the variables (i.e., HPS as the exogenous variable in the model and intensity/instability as the endogenous variable). Based on reviewer feedback, we tested alternative models where intensity/instability was entered as the exogenous variable and the HPS was used the endogenous variable. For high and low arousal NA intensity and instability models, alternate models had adequate fit; however, fit indices for the theorized models were superior based on $\chi 2$ test, CFI, RMSEA, and SRMR. Alternate models for high and low arousal PA intensity/instability had poor fit. Full alternate models are available in supplemental materials.

**References**


Alloy, L.B., Abramson, L.Y., Walshaw, P.D., Cogswell, A., Smith, J.M., Neeren, A.M., Hughes, M.E., Iacoviello, B.M., Gerstein, R.K., Keyser, J., Urosevic, S., Nusslock, R., 2006. Behavioral approach system (BAS) sensitivity and bipolar spectrum disorders: A retrospective and concurrent behavioral high-risk design. Motivation and Emotion 30 (2), 143–155. https://doi.org/10.1007/s11031-006-9003-3.

Angst, J., Gamma, A., Endrass, J., 2003. Risk factors for the bipolar and depression spectra. Acta Psychiatrica Scandinavica 108 (s418), 15–19. https://doi.org/10.1034/j.1600-0447.108.s418.4.x.

Arndt, C., Lischetzke, T., Crayen, C., Eid, M., 2018. The assessment of emotional clarity via response times to emotion items: shedding light on the response process and its relation to emotion regulation strategies. Cognition and Emotion 32 (3), 530–548. https://doi.org/10.1080/02699931.2017.1322039.

Barrett, L.F., Gross, J., Christensen, T.C., Benvenuto, M., 2001. Knowing what you're feeling and knowing what to do about it: Mapping the relation between emotion differentiation and emotion regulation. Cognition and Emotion 15 (6), 713–724. https://doi.org/10.1080/02699930143000239.

Boden, M.T., Thompson, R.J., Dizén, M., Berenbaum, H., Baker, J.P., 2013. Are emotional clarity and emotion differentiation related? Cognition and Emotion 27 (6), 961–978. https://doi.org/10.1080/02699931.2012.751899.

Boden, M., Thompson, R., 2015. Facets of emotional awareness and associations with emotion regulation and depression. Emotion 15 (3), 399–410. https://doi.org/10.1037/emo0000057.

Boden, M.T., Thompson, R.J., 2017. Meta-analysis of the association between emotional clarity and attention to emotions. Emotion Review 9 (1), 79–85. https://doi.org/10.1177/1754073915610640.

Chapman, L.J., Chapman, J.P., 1983. Infrequency Scale for personality measures (Unpublished scale available from TR Kwapil). UIUC Department of Psychology. Champaign, IL.

Eckblad, M., Chapman, L.J., 1986. Development and validation of a scale for hypomanic personality. Journal of Abnormal Psychology 95 (3), 214–222. https://doi.org/10.1037/0021-843X.95.3.214.

Edge, M.D., Miller, C.J., Muhtadie, L., Johnson, S.L., Carver, C.S., Marquinez, N., Gotlib, I.H., 2013. People with bipolar I disorder report avoiding rewarding activities and dampening positive emotion. Journal of Affective Disorders 146 (3), 407–413. https://doi.org/10.1016/j.jad.2012.07.027.

Ehring, T., Fischer, S., Schnülle, J., Bosterling, ¨ A., Tuschen-Caffier, B., 2008. Characteristics of emotion regulation in recovered depressed versus never depressed individuals. Personality and Individual Differences 44 (7), 1574–1584. https://doi.org/10.1016/j.paid.2008.01.013.

Eisner, L., Eddie, D., Harley, R., Jacobo, M., Nierenberg, A.A., Deckersbach, T., 2017. Dialectical Behavior Therapy Group Skills Training for Bipolar Disorder. Behavior Therapy, 48 (4), 557–566. https://doi.org/10.1016/j.beth.2016.12.006.

Ellis, H.C., Ashbrook, P.W., 1988. Resource allocation model of the effects of depressed mood states on memory. In: Fiedler, K., Forgas, J. (Eds.), Affect, cognition, and social behavior. C.J. Hogrefe, Toronto, Canada, pp. 25–43.

García-Blanco, A., Salmeron, ´ L., Perea, M., Livianos, L., 2014. Attentional biases toward emotional images in the different episodes of bipolar disorder: an eye-tracking study. Psychiatry Research 215 (3), 628–633. https://doi.org/10.1016/j.psychres.2013.12.039.

Gohm, C.L., Clore, G.L., 2000. Individual differences in emotional experience: Mapping available scales to processes. Personality and Social Psychology Bulletin 26 (6), 679–697. https://doi.org/10.1177/0146167200268004.

Gohm, C.L., Clore, G.L., 2002. Affect as information: An individual-differences approach. In: Barrett, L.F., Salovey, P. (Eds.), Emotions and social behavior. The wisdom in feeling: Psychological processes in emotional intelligence. The Guilford Press, pp. 89–113.

Goldstein, T.R., Axelson, D.A., Birmaher, B., Brent, D.A., 2007. Dialectical behavior therapy for adolescents with bipolar disorder: a 1-year open trial. Journal of the American Academy of Child and Adolescent Psychiatry 46 (7), 820–830. https://doi.org/10.1097/chi.0b013e31805c1613.

Goldstein, T.R., Fersch-Podrat, R.K., Rivera, M., Axelson, D.A., Merranko, J., Yu, H., Brent, D.A., Birmaher, B., 2015. Dialectical behavior therapy for adolescents with bipolar disorder: results from a pilot randomized trial. Journal of Child and Adolescent Psychopharmacology 25 (2), 140–149. https://doi.org/10.1089/cap.2013.0145.

Heck, R.H., Thomas, S.L., 2015. An introduction ot multilevel modeling (Third Edit). Routledge, New York, NY.

Henry, C., Mitropoulou, V., New, A.S., Koenigsberg, H.W., Silverman, J., Siever, L.J., 2001. Affective instability and impulsivity in borderline personality and bipolar II disorders: Similarities and differences. Journal of Psychiatric Research 35 (6), 307–312. https://doi.org/10.1016/S0022-3956(01)00038-3.

Henry, C., Van den Bulke, D., Bellivier, F., Roy, I., Swendsen, J., M'Baïlara, K., Siever, L. J., Leboyer, M, 2008. Affective lability and affect intensity as core dimensions of bipolar disorders during euthymic period. Psychiatry research 159 (1-2), 1–6. https://doi.org/10.1016/j.psychres.2005.11.016.

Hollander, E., Pallanti, S., Allen, A., Sood, E., Baldini Rossi, N., 2005. Does sustained release lithium reduce impulsive gambling and affective instability versus placebo in pathological gamblers with bipolar spectrum disorders? American Journal of Psychiatry 162 (1), 137–145.

Hu, L.T., Bentler, P.M., 1999. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal 6 (1), 1–55.

Huang, S., Berenbaum, H., Chow, P.I., 2013. Distinguishing voluntary from involuntary attention to emotion. Personality and Individual Differences 54 (8), 894–898. https://doi.org/10.1016/j.paid.2012.12.025.

Jahng, S., Wood, P.K., Trull, T.J., 2008. Analysis of affective instability in ecological momentary assessment: Indices using successive difference and group comparison via multilevel modeling. Psychological Methods 13, 354–375. https://doi.org/10.1037/a0014173.

Johnson, S.L., 2005. Mania and dysregulation in goal pursuit: A review. Clinical Psychology Review 25 (2), 241–262. https://doi.org/10.1016/j.cpr.2004.11.002.

Johnson, S.L., Fulford, D., Carver, C.S., 2012. The double-edged sword of goal engagement: Consequences of goal pursuit in bipolar disorder. Clinical Psychology & Psychotherapy 19 (4), 352–362. https://doi.org/10.1002/cpp.1801.

Johnson, S.L., Sandrow, D., Meyer, B., Winters, R., Miller, I., Solomon, D., Keitner, G., 2000. Increases in manic symptoms after life events involving goal attainment. Journal of Abnormal Psychology 109 (4), 721–727. https://doi.org/10.1037/0021-843X.109.4.721.

Kashdan, T.B., Barrett, L.F., McKnight, P.E., 2015. Unpacking emotion differentiation: Transforming unpleasant experience by perceiving distinctions in negativity. Current Directions in Psychological Science 24 (1), 10–16. https://doi.org/10.1177/0963721414550708.

Kwapil, T.R., Barrantes-Vidal, N., Armistead, M.S., Hope, G.A., Brown, L.H., Silvia, P.J., Myin-Germeys, I., 2011. The expression of bipolar spectrum psychopathology in daily life. Journal of Affective Disorders 130 (1-2), 166–170. https://doi.org/10.1016/j.jad.2010.10.025.

Kwapil, T.R., Miller, M.B., Zinser, M.C., Chapman, L.J., Chapman, J., Eckblad, M., 2000. A longitudinal study of high scorers on the Hypomanic Personality Scale. Journal of Abnormal Psychology 109, 222–226. https://doi.org/10.1037/0021-843X.109.2.222.

Lieberman, M.D., Inagaki, T.K., Tabibnia, G., Crockett, M.J., 2011. Subjective responses to emotional stimuli during labeling, reappraisal, and distraction. Emotion 11 (3), 468–480. https://doi.org/10.1037/a0023503.

Loas, G., Dhee-Perot, P., Chaperot, C., Fremaux, D., Gayant, C., Boyer, P., 1998. Anhedonia, alexithymia and locus of control in unipolar major depressive disorders. Psychopathology 31 (4), 206–212. https://doi.org/10.1159/000029041.

Merchan-Clavellino, ´ A., Alameda-Bailén, J.R., Zayas García, A., Guil, R., 2019. Mediating Effect of Trait Emotional Intelligence Between the Behavioral Activation System

(BAS)/Behavioral Inhibition System (BIS) and Positive and Negative Affect. Frontiers in Psychology 10, 424. https://doi.org/10.3389/fpsyg.2019.00424.

Muhtadie, L., Johnson, S.L., 2015. Threat sensitivity in bipolar disorder. Journal of Abnormal Psychology 124 (1), 93–101. https://doi.org/10.1037/a0038065.

Muthén, L.K., Muthén , B.O., 2010. Mplus user's guide. Muthén & Muthén , Los Angeles, CA.

Neumann, D., Malec, J.F., Hammond, F.M., 2017. Reductions in Alexithymia and Emotion Dysregulation After Training Emotional Self-Awareness Following Traumatic Brain Injury: A Phase I Trial. The Journal of Head Trauma Rehabilitation 32 (5), 286–295. https://doi.org/10.1097/HTR.0000000000000277.

Prisciandaro, J.J., Tolliver, B.K., DeSantis, S.M., 2018. Identification and initial validation of empirically derived bipolar symptom states from a large longitudinal dataset: an application of hidden Markov modeling to the Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD) study. Psychological Medicine 1–7. https://doi.org/10.1017/S0033291718002143.

Rosseel, Y., 2012. Lavaan: An R package for structural equation modeling and more. Version 0.5–12 (BETA). Journal of statistical software 48 (2), 1–36.

Russell, J.A., 1980. A circumplex model of affect. Journal of Personality and Social Psychology 39 (6), 1161–1178. https://doi.org/10.1037/h0077714.

Salovey, P., Mayer, J.D., Goldman, S.L., Turvey, C., Palfai, T.P., 1995. Emotional attention, clarity, and repair: Exploring emotional intelligence using the Trait MetaMood Scale. In: Pennebaker, J. (Ed.), Emotion, disclosure, and health. American Psychological Association, Washington, DC.

Salovey, P., Stroud, L.R., Woolery, A., Epel, E.S., 2002. Perceived emotional intelligence, stress reactivity, and symptom reports: Further explorations using the trait meta mood scale. Psychology and Health 17 (5), 611–627. https://doi.org/10.1080/08870440290025812.

Schwarz, N., Clore, G.L., 1983. Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. Journal of Personality and Social Psychology 45 (3), 513–523. https://doi.org/10.1037/0022-3514.45.3.513.

Sperry, S.H., Kwapil, T.R., 2017. What can daily life assessment tell us about the bipolar spectrum? Psychiatry Research 252, 51–56. https://doi.org/10.1016/j.psychres.2017.02.045.

Sperry, S.H., Kwapil, T.R., 2019. Affective dynamics in bipolar spectrum psychopathology: Modeling inertia, reactivity, variability, and instability in daily life. Journal of affective disorders 251, 195–204.

Sperry, S.H., Kwapil, T.R., 2020. Bipolar spectrum psychopathology is associated withaltered emotion dynamics across multiple timescales. Emotion. https://doi.org/10.1037/emo0000759. Advance online publication.

Sperry, S.H., Walsh, M.A., Kwapil, T.R., 2020. Emotion dynamics concurrently and prospectively predict mood psychopathology. Journal of Affective Disorders 261, 67–75. https://doi.org/10.1016/j.jad.2019.09.076.

Stange, J.P., Boccia, A.S., Shapero, B.G., Molz, A.R., Flynn, M., Matt, L.M., Abramson, L. Y., Alloy, L.B., 2013. Emotion regulation characteristics and cognitive vulnerabilities interact to predict depressive symptoms in individuals at risk for bipolar disorder: A prospective behavioural high-risk study. Cognition and Emotion 27 (1), 63–84. https://doi.org/10.1080/02699931.2012.689758.

Storbeck, J., Clore, G.L., 2008. Affective Arousal as Information: How Affective Arousal Influences Judgments, Learning, and Memory. Social and Personality Psychology Compass 2 (5), 1824–1843. https://doi.org/10.1111/j.1751-9004.2008.00138.x

Thompson, R.J., Boden, M.T., Gotlib, I.H., 2017. Emotional variability and clarity in depression and social anxiety. Cognition and Emotion 31 (1), 98–108. https://doi.org/10.1080/02699931.2015.1084908.

Thompson, R.J., Diz´en, M., Berenbaum, H., 2009. The Unique Relations between Emotional Awareness and Facets of Affective Instability. Journal of Research in Personality 43 (5), 875–879. https://doi.org/10.1016/j.jrp.2009.07.006.

Thompson, R.J., Kuppens, P., Mata, J., Jaeggi, S.M., Buschkuehl, M., Jonides, J., Gotlib, I.H., 2015. Emotional Clarity as a Function of Neuroticism and Major Depressive Disorder. Emotion 15 (5), 615. https://doi.org/10.1037/EMO0000067.

Thompson, R.J., Mata, J., Jaeggi, S.M., Buschkuehl, M., Jonides, J., Gotlib, I.H., 2011. Concurrent and prospective relations between attention to emotion and affect intensity: An experience sampling study. Emotion 11 (6), 1489–1494. https://doi.org/10.1037/a0022822.

Torre, J.B., Lieberman, M.D., 2018. Putting feelings into words: Affect labeling as implicit emotion regulation. Emotion Review 10 (2), 116–124. https://doi.org/10.1177/1754073917742706.

Van Dijk, S., Jeffrey, J., Katz, M.R., 2013. A randomized, controlled, pilot study of dialectical behavior therapy skills in a psychoeducational group for individuals with bipolar disorder. Journal of Affective Disorders 145 (3), 386–393. https://doi.org/10.1016/j.jad.2012.05.054.

Van Rheenen, T.E., Murray, G., Rossell, S.L., 2015. Emotion regulation in bipolar disorder: Profile and utility in predicting trait mania and depression propensity. Psychiatry Research 225 (3), 425–432. https://doi.org/10.1016/j.psychres.2014.12.001.

Vine, V., Aldao, A., 2014. Impaired emotional clarity and psychopathology: A transdiagnostic deficit with symptom-specific pathways through emotion regulation. Journal of Social and Clinical Psychology 33 (4), 319–342. https://doi.org/10.1521/jscp.2014.33.4.319.

Walsh, M.A., Royal, A., Brown, L.H., Barrantes-Vidal, N., Kwapil, T.R., 2012. Looking for bipolar spectrum psychopathology: Identification and expression in daily life. Comprehensive Psychiatry 53 (5), 409–421. https://doi.org/10.1016/j.comppsych.2011.06.006.

Walsh, M.A., DeGeorge, D.P., Barrantes-Vidal, N., Kwapil, T.R., 2015. A 3-year longitudinal study of risk for bipolar spectrum psychopathology. Journal of Abnormal Psychology 124 (3), 486–497. https://doi.org/10.1037/abn0000045.

Watson, D., Clark, L.A., Tellegen, A., 1988. Development and validation of brief measures of positive and negative affect: The PANAS scales. Journal of Personality and Social Psychology 54 (6), 1063–1070. https://doi.org/10.1037/0022-3514.54.6.1063.

Wegener, D.T., Petty, R.E., 1994. Mood management across affective states: The hedonic contingency hypothesis. Journal of Personality and Social Psychology 66 (6), 1034–1048. https://doi.org/10.1037/0022-3514.66.6.1034.

Wegener, D.T., Petty, R.E., Smith, S.M., 1995. Positive mood can increase or decrease message scrutiny: The hedonic contingency view of mood and message processing. Journal of Personality and Social Psychology 69 (1), 5–15. https://doi.org/10.1037/0022-3514.69.1.5.

Zinbarg, R.E., Revelle, W., Yovel, I., Li, W., 2005. Cronbach's, α Revelle's β and McDonald's ω H: Their relations with each other and two alternative conceptualizations of reliability. Psychometrika 70 (1), 123–133. https://doi.org/10.1007/s11336-003-0974-7.