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Multivariate Associations of Ideal Affect With Clinical Symptoms

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Abstract

Prior research has indicated that ideal affect (i.e., the affective states that people value and would ideally like to experience) may be relevant to mental health outcomes. Studies to date, however, have not used comprehensive multivariate models that account for covariation among facets of ideal affect and incorporate multiple clinical outcomes. In the present studies, we used structural equation modeling to examine the multivariate effects of ideal affect on symptoms of depression, anxiety, and alcohol abuse in 2 moderately large samples of undergraduates (N = 293 and N = 146). Exploratory results of Study 1 indicated that valuation of high arousal positive affective states was significantly associated with lower depression symptoms but higher anxiety and alcohol abuse symptoms and that valuation of high arousal negative states was specifically associated with greater anxiety symptoms. These results were shown to be structurally invariant across samples and ethnicities in Study 2, which also found that ideal–actual affect discrepancies were significantly associated with symptoms of depression and anxiety. These findings support and extend the hypothesis that ideal affect is implicated in clinical outcomes by highlighting the importance of jointly considering multiple facets of ideal and actual affect as they relate to a range of clinical syndromes.

Keywords

ideal affect; transdiagnostic; internalizing; externalizing; structural equation modeling

Theory and research findings have consistently affirmed the manifold consequences of attitudes toward and beliefs about emotion (e.g., De Castella et al., 2013; Frijda, Manstead, & Bem, 2000; Izard, 1971; Manser, Cooper, & Trefusis, 2012; Mendonça, 2013; Rimes & Chalder, 2010). Prior research has implicated beliefs about emotion in the etiology and treatment of a range of psycho-pathologies (e.g., Campbell-Sills, Barlow, Brown, & Hofmann, 2006; Gratz, 2007; Ioannou & Fox, 2009; Mennin, Heimberg, Turk, & Fresco, 2005; Rimes & Wingrove, 2013; Wells & Papa-georgiou, 2004; Whelton, 2004).

Within the realm of emotion attitudes, one important source of individual difference is the degree to which affective states are valued. Although most people generally report wanting to feel good (Elliot & Thrash, 2002), research has consistently demon-strated that there are individual- and group-level (e.g., cultural) differences in what it means to feel good, the behaviors people engage in to feel good, and the extent to which individuals are motivated to

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experience or avoid specific positive and negative affective states (e.g., Koopmann-Holm & Tsai, 2014; see Tsai, 2007, for a review). Jeanne Tsai and colleagues introduced the term *ideal affect* to distinguish the affective states that people value and want to experience from the *actual affect* that people experience (Tsai, Knutson, & Fung, 2006). The Affect Valuation Index (AVI; Tsai, Knutson, & Fung, 2006) was designed to disentangle ideal and actual affect. Drawing on the circumplex model of affect (Russell, 1980), the AVI assesses tendencies to value and experience high arousal positive (HAP; e.g., excitement), low arousal positive (LAP; e.g., calm), high arousal negative (HAN; e.g., anger), and low arousal negative (LAN; e.g., sadness) affective states.

Although ideal affect fluctuates across time and between contexts, it is thought to be relatively stable and to be heavily influenced by culture and socialization (Tsai, 2013; Tsai, Louie, Chen, & Uchida, 2007; Tsai, Miao, Seppala, Fung, & Yeung, 2007). Individual differences in ideal affect and discrepancies between ideal and actual affect have been linked to such diverse outcomes as experiences and memories of emotions (Scollon, Howard, Caldwell, & Ito, 2009; Sims et al., 2015), emotional expression (Tsai et al., 2016), health-related decision-making (Sims, Tsai, Koopmann-Holm, Thomas, & Goldstein, 2014), physical health (Scheibe, English, Tsai, & Carstensen, 2013), consumer behavior (Tsai, Chim, & Sims, 2015), and interpersonal interactions (Sims & Tsai, 2015; Steele, Ferrer, & Nesselroade, 2014).

Tsai and colleagues (2006) have postulated that ideal affect may have important ramifications for the experience and treatment of mental illness. According to their theory, distress is likely to arise when individuals' actual affect is incommensurate with their ideal affect. In turn, this distress might manifest clinically in, for example, symptoms of depression or anxiety or in maladaptive efforts to reduce distress-inducing discrepancies (e.g., abusing substances that heighten pleasurable feelings or diminish negative feelings in order to approximate one's ideal state). These examples point to one way in which extremes in affect valuation or devaluation may be particularly deleterious for mental well-being: namely, that they may be either wholly unattainable or unattainable without significant costs, potentially resulting in chronic distress arising from the persistent inability to achieve one's desired emotional state or the frequent use of maladaptive strategies for inducing and regulating affect (e.g., habitual avoidance of situations that induce negative affect motivated by the desire not to experience negative affect; see Chawla & Ostafin, 2007). Moreover, consistent with the notion that ideal affect is critical for appraising and coping with affect-inducing situations, valuing negative emotions may enhance one's ability to tolerate distressing experiences (Luong, Wrzus, Wagner, & Riediger, 2016), of import given that difficulties in tolerating distress have been linked to a range of clinical outcomes (see Zvolensky, Vujanovic, Bernstein, & Leyro, 2010, for review). These theoretical perspectives suggest that in considering the relationship between ideal affect and mental health, it may be important to consider both absolute levels of ideal affect and the alignment between ideal and actual affect.

Multiple bodies of empirical research have supported the conclusion that individual differences in affect valuation are relevant for mental health outcomes. For example, in a recent experience-sampling study, valuing negative affect significantly attenuated the

association between daily experiences of negative affect and negative physical and psychosocial health outcomes, including self-reported symptoms of irritability, depression, and anxiety (Luong et al., 2016). Moreover, valuing positive affect (but not valuing negative affect) was significantly associated with well-being at the bivariate level, such that appraising positive emotions as more pleasant, useful, appropriate, and meaningful related to higher life satisfaction.

In the realm of positive affect, prior research has shown that valuing happiness is complexly associated with a range of psychological outcomes, both positive and negative, including experiences of happiness and loneliness (Mauss et al., 2012; Mauss, Tamir, Anderson, & Savino, 2011) and well-being (Bastian, Kuppens, De Roover, & Diener, 2014; Catalino, Algoe, & Fredrickson, 2014; Ford, Dmitrieva, et al., 2015; Luhmann, Necka, Schönbrodt, & Hawkley, 2016). Interpretation of these findings is challenging, however, in that researchers have emphasized different aspects of valuing and pursuing happiness (see Catalino et al., 2014; Luhmann et al., 2016) and differential consequences of valuing happiness across cultures (e.g., Bastian et al., 2014; Ford, Dmitrieva, et al., 2015). Moreover, operationalizations of well-being have varied substantially across studies, with most studies examining well-being in terms of life satisfaction but others also incorporating elements of hedonic well-being and positive affect, psychological well-being, and symptoms of depression.

With respect to mental illness, previous studies have suggested that valuing happiness to an extreme degree may be related to higher rates of symptoms and diagnoses of depression and heightened risk for bipolar disorder (Ford, Mauss, & Gruber, 2015; Ford, Shallcross, Mauss, Floerke, & Gruber, 2014; but see also Catalino et al., 2014, for a different perspective on the pursuit of happiness). It must be noted, however, that although happiness has a clear positive valence, it is not inherently associated with a particular level of arousal (see Tsai & Park, 2014, for a discussion of happiness in the context of affect valuation theory). Yet, disentangling the unitary construct of happiness into high and low arousal positive affective states may be crucial from a clinical perspective: not only may arousal have important functional consequences, but also interventions that are designed to upregulate positive affect can often be differentiated in their effects on low arousal versus high arousal positive affect (e.g., meditation vs. physical exercise). In turn, individuals may be more motivated to engage in interventions that match their ideal affect.

Although the affect valuation framework has only rarely been applied to the study of anxiety disorders, individual differences in affective preferences and beliefs, including a desire for emotional avoidance, are thought to play a key role in the development and maintenance of anxiety disorders. For example, the contrast avoidance model of worry in generalized anxiety disorder suggests that individuals with generalized anxiety disorder prefer to experience sustained, low-level negative affect (maintained by chronic worry) rather than experience unexpected shifts from positive or neutral affect to intense negative affect (see Newman & Llera, 2011). Similarly, in the realm of problematic substance use, it has been suggested that the use of substances such as alcohol as a coping mechanism may be related not only to the frequency and severity of individuals' experiences of negative affect but also

to how individuals feel about the negative emotions that they experience (e.g., Shaver, Veilleux, & Ham, 2013).

Only a few investigations have directly examined affect valuation in relation to clinical outcomes. Of these investigations, two have focused on the AVI in relation to internalizing syndromes of depression and anxiety. In the first, *discrepancies* between ideal and actual HAP or LAP (depending on cultural background) accounted for a significant percentage of the variance in self-reported depression symptoms, such that greater discrepancies were related to higher levels of depression (Tsai et al., 2006). This finding potentially enriches the understanding of the previously discussed findings on valuing happiness, suggesting that it may not be valuing happiness per se but rather valuing happiness and not attaining it that is related to depression. The authors, however, did not report effects of ideal affect in and of itself (referred to as absolute ideal affect), nor did they describe effects of LAN or HAN. In the second study, *absolute* ideal affect did not significantly differentiate individuals with and without major depressive disorder and generalized anxiety disorder (Thompson, Kircanski, & Gotlib, 2016).

Researchers have also investigated the relationship between ideal affect and substance use behaviors (e.g., Tsai, 2007). Tsai, Knutson, and Rothman (2007; findings described in Tsai, 2007) reported a significant difference in *absolute* ideal LAP (adjusting for actual LAP) such that individuals who had used cocaine valued LAP significantly less than did those who had not, in line with the authors' notion that a relative preference for HAP over LAP may be related to a preference for stimulants over other illicit drugs. In addition, in the subset of individuals who had used cocaine more than once, the *discrepancy* between actual and ideal HAP was associated with self-reported likelihood of future use of cocaine, in keeping with the notion that a perceived deficit in HAP can motivate engagement in behaviors that are HAP-inducing.

Although two of these three studies suggest that ideal affect has important consequences for mental health, there is an overall paucity of research examining links between ideal affect and clinical syndromes. It is particularly difficult to generalize across this small literature given differences across studies in the clinical syndromes of interest and the facets of affect examined. Of particular note with respect to the present investigation, none of the studies reported to date have used comprehensive multivariate models to account for covariance among all four quadrants of ideal affect (i.e., HAP, LAP, LAN, and HAN) and simultaneously incorporate multiple clinical outcome domains. Identifying unique relationships between affective tendencies and specific syndromes, as permitted by multivariate modeling, has provided helpful insights for understanding etiology and treatment in other work. For example, although symptoms of depression and anxiety are highly correlated, hierarchical models have indicated that although both syndromes can be related to negative affectivity, deficits in the experience of positive affect are relatively specific to depression (see Watson & Naragon-Gainey, 2010). A large body of work has now profitably focused on understanding the neural basis of deficits in positive affectivity (e.g., Treadway & Zald, 2011) and interventions to improve positive affect within depression (e.g., behavioral activation; see Dimidjian, Barrera, Martell, Muñoz, & Lewinsohn, 2011). This

type of work to disentangle the role of ideal affective tendencies as they relate uniquely to anxiety, depression, and alcohol use has not been conducted.

Therefore, in the present studies, we sought to examine the effects of ideal affect on symptoms of internalizing and externalizing syndromes within a multivariate framework. We used structural equation modeling to examine the unique contributions of ideal affect valuation to symptoms of depression and anxiety (internalizing) and alcohol abuse (externalizing). In Study 1, we adopted a data-driven, exploratory approach to model selection and testing. On the one hand, the literature provides grounding for a priori hypotheses regarding how specific facets of ideal affect might be related to specific symptom profiles in bivariate analyses (e.g., valuing happiness would be associated with depression, valuing low-intensity negative affect would be associated with anxiety, not valuing negative affect would be associated with alcohol use). Nonetheless, we ultimately concluded that the multivariate relationships between affect valuation and clinical outcomes were sufficiently complex (see Luhmann et al., 2016) to permit an excess of plausible alternative models. We did anticipate that our exploratory multivariate analyses would ultimately replicate past findings; however, given that no prior studies had employed comparable multivariate frameworks, we elected not to constrain model selection based on past findings.

In light of the exploratory nature of the model that emerged as part of Study 1, we conducted a second study in which we used multiple-group structural invariance procedures to cross-validate the Study 1 model. We also conducted additional exploratory analyses as part of Study 2. Specifically, we used multiple-group analysis to test whether the significant pathways that had emerged in the Study 1 model were invariant across three ethnic categories (White, Asian, and Hispanic) to examine whether the consequences of valuing certain affective states varied systematically as a function of ethnic identity. We also used exploratory procedures similar to those employed in Study 1 to examine the relationship between ideal–actual affect *discrepancies* and mood symptoms in light of past findings and theorizing suggesting that such discrepancies may be especially relevant to the mental health context.

Study 1

Method

Participants.—Participants were 300 undergraduate students (75% female; 30.7% non-Hispanic White; M_{Age} = 21.2, SD = 2.3) enrolled at a large public university who participated in exchange for partial course credit. All participants were over the age of 18 and able to read and write fluently in English. Seven participants (2.3%) did not complete all relevant study measures and were excluded from analyses, yielding 293 valid cases.

Measures.

Ideal affect valuation.: The ideal affect subscale of the Affect Valuation Index self-report questionnaire was designed to assess ideal affective states spanning the four quadrants of the affective circumplex. Participants were asked to rate how often they would *ideally* like to

have each of 30 discrete affective states "over the course of a typical week" on a 5-point Likert scale ranging from 1 (*never*) to 5 (*all the time*). Raw scores were summed to calculate subscores for HAP, LAP, LAN, and HAN. Prior research has indicated that the AVI has sound psychometric properties, including good test–retest reliability and convergent and discriminant validity (Tsai et al., 2006), and all subscales demonstrated good internal reliability in the current sample (α_{HAP} = .83; α_{LAP} = .84; α_{LAN} = .87; α_{HAN} = .80).

Depression and anxiety symptoms.: The Mood and Anxiety Symptom Questionnaire—Short Form (MASQ–SF; Watson & Clark, 1991) is a 62-item self-report questionnaire designed to assess commonly occurring symptoms of mood and anxiety syndromes. Participants were asked to rate how much they had felt or experienced each system during the past week on a 5-point Likert scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*). The MASQ–SF consists of four factor-analytically supported subscales: General Distress: Depressive Symptoms (12 items) and General Distress: Anxious Symptoms (11 items), Anhedonic Depression (22 items), and Anxious Arousal (17 items). For the present study, the depression- and anxiety-relevant subscales were summed to create two composite scores ($M_{Depression}$ = 92.5, SD = 24.9; $M_{Anxiety}$ = 51.0, SD = 18.6). The MASQ–SF has shown good internal reliability in student, community, and patient samples (Watson et al., 1995), and internal reliability for the composite scores was excellent in the current sample ($\alpha_{Depression}$ = .97; $\alpha_{Anxiety}$ = .94).

Alcohol abuse symptoms.: The Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) is a 10-item alcohol abuse screening tool developed by the World Health Organization that assesses the frequency (e.g., "How often do you have a drink containing alcohol?" rated from 0 = *never* to 4 = *4 or more times a week*) and the nature of alcohol consumption (e.g., "How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?" rated from 0 = *never* to 4 = *daily or almost daily*). Participants were provided with a chart that defined a standard drink of alcohol. Although the AUDIT was originally developed to screen for problematic or dangerous alcohol use in primary-care settings, research has suggested that it is a valid assessment for college student populations as well (Kokotailo et al., 2004), and the AUDIT showed good reliability in the current sample (α = .85; M = 5.5, SD = 5.6).

Procedures.—All procedures, including informed consent, were completed online using the Qualtrics survey platform (Qualtrics, Provo, UT). Participants completed the ideal affect subscale of the AVI, the MASQ–SF, the AUDIT, and a demographic questionnaire as part of a larger protocol on emotion and emotion regulation. All procedures were approved by the Institutional Review Board prior to data collection.

Data analysis.—Pearson correlations were used to examine the zero-order relationships among key study variables. These same variables were then entered in a saturated (i.e., all paths assumed) structural equation model (see Figure 1) to examine the unique contribution of each of the four ideal affect indices to the three symptom domains, adjusting for covariation among the symptom indices to account for common method variance. This

saturated model reflects the baseline assumption that each of the quadrants of ideal should be empirically evaluated to determine whether it is systematically and uniquely associated with each of the clinical syndromes. The path model was implemented in IBM SPSS Amos 24 with HAP, LAP, LAN, and HAN entered as exogenous (independent) variables and depression, anxiety, and alcohol abuse symptoms as endogenous (dependent) variables.

Model identification was carried out using exploratory all subset regression procedures (implemented using the Specification Search feature in IBM SPSS Amos 24; Schumacker, 2006). All subset regression involves the sequential computation and comparison of all possible deviations from the saturated model (in this case, $k = 4{,}096$). Specifically, all paths connecting the exogenous variables to the endogenous variables were designated as optional for the specification search, permitting the systematic evaluation of every possible configuration of pathways linking ideal affect to clinical symptoms for inclusion in the final model. Compared to traditional algorithmic approaches to variable selection (e.g., stepwise regression), all subset regression has the advantage that it identifies the models with the best fit out of *all* possible permutations, whereas stepwise regression procedures may terminate prior to evaluating the model that yields the best fit (Livingstone & Salt, 2005).

Two indices of comparative model fit were used to select the best fitting model: the Akaike information criterion (AIC) and the Bayesian information criterion (BIC). Whereas the AIC emphasizes maximizing the likelihood of successful prediction of future data, the BIC weights parsimony more heavily (Kuha, 2004). Whereas predictive power, as emphasized in the AIC, is of critical importance from a clinical standpoint (Shmueli, 2010), from a basic theory development standpoint, the BIC aligns with a fundamental goal of identifying parsimonious, well-fitted models (Cramer, 2013). Therefore, we followed Kuha's (2004) guidance in adopting both the AIC and BIC as incommensurate but complementary criteria for model selection.

Bootstrapping procedures were implemented in IBM SPSS Amos 24 to manage moderate violations of joint multivariate normality. The sampling distribution of multivariate effects was bootstrapped 20,000 times to provide robust, nonparametric estimates of absolute goodness-of-fit indices and bias-corrected 95% confidence intervals (CIs) for interpretation of regression coefficients (Bollen & Stine, 1992; Walker & Smith, 2016). We reported standardized beta values. As recommended by Kline (2005), goodness of model fit was determined using the chi-square test of model fit (cutoff: $p < .05$), the root-mean-square error of approximation (RMSEA; cutoff < .06), and the Bentler comparative fit index (CFI; cutoff > .95).

Results

Bivariate associations between ideal affect and clinical symptoms.—Zero-order correlations between key study variables are reported in Table 1. The ideal affect subscales (AVI) were moderately to highly intercorrelated (all rs > |.38|). Valuing HAP (AVI) was significantly associated with higher symptoms of alcohol abuse but lower depression scores. Valuing LAP was associated with lower anxiety scores, whereas valuing LAN and HAN were associated with higher anxiety and depression scores. Higher anxiety scores (MASQ–SF) were associated with significantly higher depression (MASQ–SF) and alcohol abuse

symptoms (AUDIT), but no significant association between depression and alcohol abuse was detected.

Multivariate associations between ideal affect and clinical symptoms.—The final model yielded by the all-subsets regression specification procedure demonstrated good fit overall, $\chi^2(8, N = 293) = 14.53$, Bollen-Stine bootstrap $p = .07$, adjusted RMSEA = .05, adjusted CFI = .99, AIC = 54.6, BIC = 128. As shown in Figure 2, valuation of HAP was significantly associated with depression ($\beta = -.22$, $p < .001$, 95% CI [−.33, −.11]), anxiety ($\beta = .14$, $p < .01$, 95% CI [.04, .24]), and alcohol abuse ($\beta = .22$, $p < .001$, 95% CI [.12, .32]) scores. Valuation of HAN was significantly associated with anxiety symptoms ($\beta = .39$, $p < .001$, 95% CI [.29, .48]). Unique contributions of LAP and LAN did not survive in the final model.

Discussion

Collectively, both the bivariate and the multivariate results support the notion that ideal affect is implicated in internalizing and externalizing syndromes. After accounting for covariation among the four ideal affect quadrants, unique relationships emerged such that valuing HAN states, such as fear, was associated with elevated symptoms of anxiety and that valuing HAP states, such as excitement, was associated with elevated anxiety and alcohol abuse but diminished depression symptoms. Unique contributions of LAN and LAP states, such as sadness and calm, did not survive in the final model.

The association between HAN and anxiety symptoms is both fitting and potentially counterintuitive. Anxiety disorders are characterized by both excessive negative affectivity and excessive autonomic arousal; thus, individuals who have been socialized to value such affective experiences may be more motivated to engage in anxiety-inducing behaviors, to form appraisals that are consistent with the experience of anxiety, or perhaps to be more willing to report the experience of anxiety symptoms. Yet, in light of the well-documented relationship between anxiety and avoidance of negative emotions, one might have expected to see the opposite pattern, with individuals with high levels of anxiety reporting that they would ideally like to experience low levels of HAN. One possibility is that individuals who experience chronically high, uncontrollable levels of anxiety symptoms may adjust their affective values to more closely resemble their affective experience, perhaps by reappraising the experience of high arousal negativity as more useful or meaningful (see Borkovec & Roemer, 1995, on the perceived functions of worry in individuals with generalized anxiety disorder). This possibility is in line with the previously mentioned contrast avoidance model of worry, which suggests that individuals with generalized anxiety disorder display a preference for sustained, low-level negative affect to protect themselves from unexpected and extreme surges of negative affect (Newman & Llera, 2011).

The observed relationship between HAP and alcohol use is interpretable in light of commonly held expectancies that alcohol will enhance positive affect (Kuntsche, Knibbe, Gmel, & Engels, 2005). However, the relationships between HAP and the internalizing symptoms of depression and anxiety are more perplexing, with an apparent dissociation being observed such that valuing HAP was associated with higher anxiety symptoms but

lower depression symptoms. This finding is potentially consistent with past analyses suggesting that depression and anxiety share a common component of high negative affectivity but may be distinguished by reduced levels of positive affectivity in depression. In this sense, higher levels of valuing HAP may buffer against anhedonic experiences associated with depression (e.g., by motivating behavioral activation; Dimidjian et al., 2011) but not against the symptoms of heightened arousal that are evident in anxiety syndromes.

It is interesting that both high arousal states, but neither of the low arousal states, emerged as significant contributors in the final path model. This pattern suggests that a desire for highly activating emotional experiences, whether positive or negative, may be especially important to understand in relation to the experience of clinical symptoms of depression, anxiety, and alcohol use. It should be noted, however, that the ideal affect subscales were substantially correlated with one another, potentially reflecting not only real overlap among these affective tendencies but also lack of emotional granularity among some people. Of concern, the inclusion of multiple correlated independent variables in a regression model, a condition referred to as multicollinearity, can result in imprecise parameter estimates that may be less likely to generalize samples other than the one to which the model was originally fitted. In addition, model selection was not guided by a priori hypotheses. Data-driven exploratory analyses are advantageous in that they make the most possible use of the information contained within the available data and may contribute to an empirical foundation for theory development (Jebb, Parrigon, & Woo, 2017). Nevertheless, the specific associations that emerged as significant in the all-subsets regression must be regarded as tentative. Given both the high degree of multicollinearity and the exploratory nature of the analyses, we sought to replicate the structure of the final model yielded by the all-subsets regression in Study 2 while simultaneously extending our analyses by exploring discrepancies between ideal and actual affect.

Study 2

Method

Participants.—Participants were 161 undergraduate students (72% female; 18.4% non-Hispanic White; M_{Age} = 20.2, SD = 2.7) enrolled at a large public university who participated in exchange for partial course credit. All participants were over the age of 18 and able to read and write fluently in English. Fifteen participants (9.3% of the total sample) did not complete all relevant study measures and were excluded from analyses, yielding 146 valid cases.

Measures.—Measures were identical to those described in Study 1, except that participants also completed the actual affect subscale of the AVI, which was not administered as part of Study 1. In keeping with prior literature that has emphasized the importance of the discrepancy between ideal and actual affect for understanding mental health outcomes (e.g., Scheibe et al., 2013; Tsai et al., 2006), we calculated discrepancy scores as difference scores between ideal and actual affect.

Reliabilities for all study measures were acceptable to good in the current sample ($\alpha_{Ideal\ HAP}$ = .75, $\alpha_{Ideal\ LAP}$ = .85, $\alpha_{Ideal\ LAN}$ = .83, $\alpha_{Ideal\ HAN}$ = .83, $\alpha_{Actual\ HAP}$ = .81, $\alpha_{Actual\ LAP}$ = .

85, $\alpha_{\text{Actual LAN}}$ = .75, $\alpha_{\text{Actual HAN}}$ = .77, $\alpha_{\text{MASQ–SF Depression}}$ = .96, $\alpha_{\text{MASQ–SF Anxiety}}$ = .97, α_{AUDIT} = .84). Average depression (M = 91.8, SD = 24.7) and anxiety (M = 53.8, SD = 22.9) scores were comparable to those observed in the Study 1 sample, $t_{\text{Depression}}(437) = .28$, $p = .78$, and $t_{\text{Anxiety}}(437) = 1.37$, $p = .17$. However, average alcohol scores (M = 15.2, SD = 5.0) were significantly higher in the Study 2 sample than in the Study 1 sample, $t(437) = 17.70$, $p < .001$.

Data analysis.—In the first stage of data analysis, we used multiple-group structural invariance procedures to cross-validate the final model that had emerged in Study 1 (see Figure 2). Specifically, we evaluated the invariance of the paths linking ideal affect to symptoms to test whether the paths that we had derived through exploratory analyses in Study 1 would replicate in a second, confirmatory sample drawn from the same population. To accomplish this aim, we specified the Study 1 final model in AMOS 24 and conducted a multiple-group analysis that included both the exploratory sample from Study 1 and the cross-validation sample from Study 2. We first examined the configural (i.e., unconstrained) model to determine the reasonableness of the overall model, which is a necessary precondition for multiple-group analysis. We then evaluated a constrained model in which the path coefficients were specified to be equal for the exploratory and confirmatory samples to assess the structural invariance of the paths.

In the second stage of data analysis, we conducted exploratory analyses to test the invariance of the model obtained in Study 1 across three ethnic groups (White individuals, n = 113; Hispanic individuals, n = 68; and Asian individuals, n = 209) and to explore links of ideal–actual affect *discrepancies* with symptoms. For the former analyses, we used multiple-group analysis procedures identical to those that were used to cross-validate the model, collapsing across the samples from Study 1 and Study 2 to maximize sample size. Ethnic groups other than the three that were examined for invariance were represented in our samples but not at sufficiently high rates to be included in these analyses. For the latter analyses, we used specification search procedures identical to those described in Study 1, except that we substituted ideal–actual discrepancies for ideal affect.

As in Study 1, bootstrapping procedures were implemented to manage violations of joint multivariate normality. The sampling distribution of multivariate effects was bootstrapped 20,000 times to provide nonparametric estimates of absolute goodness-of-fit indices and bias-corrected 95% confidence intervals. All reported beta values are standardized.

Results

Descriptive analyses.—On average, participants tended to desire higher than experienced levels of HAP (M = 5.69, SD = 4.51) and LAP (M = 6.66, SD = 5.20) and to desire lower than experienced levels of LAN (M = −4.1, SD = 3.40) and HAN (M = −2.51, SD = 2.43). Zero-order and partial correlations between ideal affect and clinical symptoms are provided in Table 2.

Cross-validating the effects of ideal affect scores on symptoms.—As outlined in the preceding sections, our primary interest was in evaluating the final multivariate model specified in Study 1 (see Figure 2) in a new sample. Outputs of the configural model

indicated that the overall model of effects of ideal affect on symptoms was reasonable, $\chi^2(16, N = 434) = 26.46$, Bollen-Stine bootstrap $p = .1$, adjusted RMSEA = .03, and adjusted CFI = .99. Crucially, analysis of the equal paths model indicated that the overall structure of the paths was invariant across the exploratory and cross-validation samples (adjusted RMSEA = .04 and adjusted CFI = .99). In other words, model fit did not worsen when the paths were constrained to be equal, thereby cross-validating the model across samples.

Exploratory analyses.

Invariance across ethnic groups.: Next, we conducted a second multigroup analysis to determine whether the model specified in Study 1 and validated in Study 2 held across multiple ethnic groups. The configural model was acceptable, $\chi^2(24, N = 384) = 33.51$, Bollen-Stine bootstrap $p = .09$, adjusted RMSEA = .03, adjusted CFI = .99. The test of the equal paths model yielded equally good fit (adjusted RMSEA = .02 and adjusted CFI = .99), indicating that the relationships between ideal affect observed at the level of the full sample did not vary systematically as a function of ethnicity.

Ideal–actual affect discrepancies and symptoms.

Preliminary analyses.: Visual inspection of the bivariate relationships between ideal–actual affect discrepancies and symptoms suggested that these relationships might be U-shaped, with symptoms tending to increase when actual affect differed substantially from ideal affect in either direction. To evaluate U-shaped effects, we conducted two-line tests (Simonsohn, 2018), which involve computing pairs of linear regressions, one each for low and high values of ideal–actual affect discrepancy scores. Separate tests were conducted for each of the four affective quadrants paired with each of the three clinical symptom scores. These two-line tests confirmed that there were significant effects of both positive and negative discrepancy scores, such that not only experiencing less positive affect than desired or more negative affect than desired but also experiencing more positive affect than desired or less negative affect than desired discrepancies were significantly associated with greater symptoms (see Figure 3). This held for both positive and negative dimensions of ideal affect. Accordingly, for bivariate and multivariate analyses, we transformed discrepancy scores by taking the absolute values of the difference scores (discrepancy = | Ideal − Actual |), because this transformation allowed us to create a more efficient index of distance from desired affect. Bivariate relationships among these absolute discrepancy scores and symptom variables are shown in Table 3.

Multivariate associations.: The initial best fitted model yielded by the all-subsets regression did not include significant paths associated with alcohol abuse scores. Therefore, we respecified the model to examine links between ideal–actual affect discrepancies and symptoms of depression and anxiety, but not alcohol abuse, and reran the all-subsets regression.

The final model (see Figure 4) demonstrated good fit overall, $\chi^2(4, N = 146) = 3.25$, Bollen-Stine bootstrap $p = .65$, adjusted RMSEA < .001, adjusted CFI > .99. LAN discrepancy scores were significantly associated with depression symptoms, such that greater

discrepancies were associated with more severe depression symptoms (β= .34, $p < .001$, 95% CI [.20, .47]). Greater HAN discrepancy scores were associated with more severe depression (β= .17, $p < .05$, 95% CI [.02, .31]) and anxiety symptoms (β= .36, $p < .001$, 95% CI [.19, .53]). In contrast, greater LAP discrepancies were associated with *lower* levels of anxiety symptoms (β= −.20, $p < .05$, 95% CI [−.31, −.07]). Unique contributions of HAP discrepancy scores did not emerge in the final model.[1]

Discussion

Findings from Study 2 replicated and extended the results of Study 1. Confirmatory analyses suggested that the paths observed in Study 1 for ideal affect are robust associations that were not incidental to exploitation of the characteristics of the exploratory sample. Moreover, these associations did not appear to vary systematically as a function of ethnicity, suggesting that the observed relationships are not merely an artifact of ethnic homogeneity. Collectively, the parallel findings across Study 1 and 2 support the conclusion that absolute ideal affect is associated with a range of clinical outcomes.

Beyond absolute ideal affect, ideal–actual discrepancies also appeared relevant to understanding clinical symptoms, especially symptoms of internalizing mood disorders but not alcohol use symptoms. Unsurprisingly, participants in our sample tended to report that they generally experienced less HAP and LAP and more LAN and HAN than they would ideally want to experience. Consistent with past theorizing, discrepancies indicative of lower than ideal positive affect and higher than ideal negative affect were robustly associated with clinical symptoms in bivariate analyses. It is intriguing, however, that these same bivariate analyses revealed that discrepancies related to *greater* than ideal positive affect and *lower* than ideal negative affect may also be associated with distress for some individuals. In other words, the absolute magnitude of distance from desired affect appears to play a role in the experience of clinical symptoms. Analyses of the effects of ideal affect per se on clinical symptoms conducted in Study 1 suggest one plausible explanation for these more counterintuitive discrepancy findings: namely, that individuals may be able to achieve greater than desired positive affect or lower than desired negative affect by having very low desire for positive affect or very high desire for negative affect, respectively.

Multivariate analyses using the absolute values of these discrepancy scores investigated the relationship between distance from ideal affect and clinical symptoms. It was unsurprising that greater discrepancies in HAN were linked to higher symptoms of both depression and anxiety, likely reflecting the excess negative affectivity shared across these internalizing syndromes. In this regard, anxiety and depression were distinguished by LAN discrepancies such that depression symptoms were associated with greater discrepancies but anxiety symptoms, which are specifically characterized by excessive arousal, were not. Conversely, LAP discrepancies were uniquely associated with anxiety symptoms, perhaps reflecting

[1]For completeness, we also evaluated a multivariate model in which we entered the simple difference scores as the regressors, using identical all-subsets regression procedures. The overall structure of the resultant path model was substantially similar to that obtained using the absolute values of the difference scores. As with the final model reported earlier, no significant paths to alcohol abuse survived our specification procedures. The sole difference between the structures of the models of the simple difference scores and the absolute values of the difference scores was that a significant path between high arousal negative affect and depression symptoms did not survive in the former.

difficulties achieving and maintaining desired levels of tranquility in the face of frequent experiences of worry and panic. However, because the model for ideal–actual discrepancies in Study 2 relied on exploratory analyses, the specific associations observed await confirmation.

General Discussion

As previously described, prior research has suggested that individual differences in affect valuation and specifically ideal affect may be related to mental health outcomes. The ideal affect framework may provide at least a partial explanation for variability in mental health outcomes related to culture, parenting practice, and socialization (Hill, Bush, & Roosa, 2003; Lawton & Gerdes, 2014; Smokowski, Bacallao, Cotter, & Evans, 2015; Tsai, Miao, et al., 2007). In other words, the transmission of beliefs about which emotional states are valued may be one mechanism through which culture and context shape behavior and psychological health. Empirical investigations of links between ideal affect and mental health, however, have been limited both in number and in scope.

We examined whether ideal affect is associated with mental health outcomes within a multivariate framework across two moderately sized, ethnically diverse samples of undergraduates. Using both exploratory and confirmatory procedures across Studies 1 and 2, we found consistent evidence that absolute ideal affect was associated with symptoms of both mood (internalizing) and alcohol abuse (externalizing) syndromes. Of note, our findings indicate that value placed on high arousal states may be more central to symptoms than are low arousal states. Findings in Study 2 provide the additional insight that discrepancies between ideal and actual negative affective states appear germane to symptoms of anxiety and depression. Taken together, a model emerges of motivation toward or away from high arousal states as relevant to vulnerability but problems with negative affective states deviating from ideals as particularly relevant to anxiety and depression. Overall, the good model fits observed across both studies for the model of ideal affect and for the ideal–actual model tested in Study 2 support the importance of ideal affect for mental health, including symptoms of both internalizing and externalizing syndromes.

Limitations

Several critical limitations of the current studies should be acknowledged. First, the cross-sectional design limits the ability to comment on the direction of causality. Based on affect valuation theory, we assumed a priori that individuals' affect valuation was a stable, traitlike characteristic, with individual differences emerging in the course of early life socialization; however, it is not unlikely that individuals' experiences of mental illness shape how they evaluate affective states. For example, individuals who experience chronic symptoms of depression may, over time, desist from valuing and seeking positive affect. Second, both the symptom and affect measures were self-report questionnaires and so were subject to recall and reporting biases. Third, the sample comprised undergraduate students, and clinical status was not assessed. Our results may not generalize to more diverse (e.g., in terms of age) or clinical populations. Nevertheless, given the strikingly high prevalence of mental illness among college students (Auerbach et al., 2016), understanding the concomitants of mental

illness in college students is potentially clinically relevant even in cases in which those findings ultimately fail to generalize beyond the undergraduate context.

That the regressors in the multivariate analyses were so highly correlated with one another suggests that our efforts to statistically tease apart the four quadrants of ideal affect may be at odds with the meaningful overlap among these affective dimensions, potentially meaning that any dissociations detected are relevant only at the margins. Although this issue merits caution in interpretation, we nonetheless believe that disentangling these overlapping affective constructs is essential to building a clinically useful literature. For example, individuals who deeply value high arousal positive affect but who may not value low arousal positivity to the same degree may be less motivated to participate in interventions that focus on fostering LAP (e.g., mindfulness).

The apparent structural invariance of the path model across ethnic identities warrants particular caution against overinterpretation. Given that all of our participants attended the same university, it is possible that the shared culture of the university played a determinative role in shaping the apparently similar consequences of valuing certain affective states, whereas individuals who are situated in other cultures may experience differential consequences of affect valuation on clinical symptoms. In addition, we distinguished participants based on their self-reported ethnicity, not on the country in which they were raised; their level of acculturation; or any other relevant cultural-ethnic factors, such as subregions, subcultures, or intersectional identities.

Conclusions

Limitations notwithstanding, the current study extended existing research in several important ways. The samples were large enough to permit multivariate analyses that adjusted for covariation among both the exogenous and endogenous variables, which allowed for a nuanced parsing of unique contributions of each facet of ideal affect across clinical syndromes. At the same time, we were able to conduct both exploratory and confirmatory analyses of the ideal affect model, which enhances our confidence in the results. We see these results as setting the stage for future research efforts that seek to disentangle the intricacies of ideal and actual affect in relation to clinical outcomes. These efforts might involve unpacking the mechanisms whereby ideal affect and ideal– actual affect discrepancies impinge on mental illness, adopting alternative methodological approaches to disentangling the quadrants of ideal affect from one another (e.g., experiments that manipulate desire for high arousal vs. low arousal) or employing alternative statistical approaches to conjointly considering ideal and actual affect.

Overall, our results highlight the importance of studying facets of people’s emotional lives beyond emotional experience and expression, specifically including affect valuation, in connection with mental health, including both internalizing and externalizing symptoms. Our findings across Study 1 and Study 2 suggest that both ideal affect per se and ideal–actual affect discrepancies are associated with mental health outcomes, suggesting that future research ought to take both of these aspects of affect (i.e., wanting and attaining) into account.

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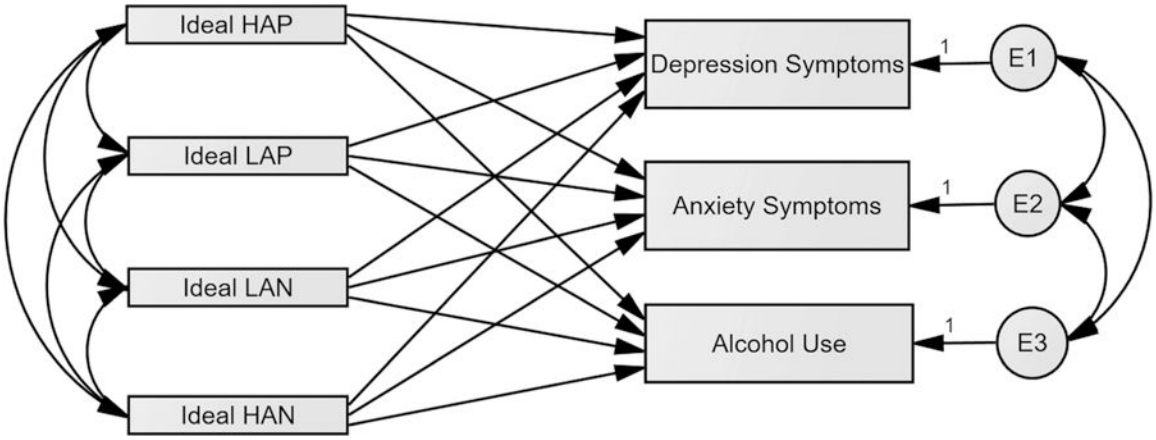

Figure 1.

Saturated model of the relationship between ideal affect and symptoms. HAP = high arousal positive affect; LAP = low arousal positive affect; LAN = low arousal negative affect; HAN = high arousal negative affect.

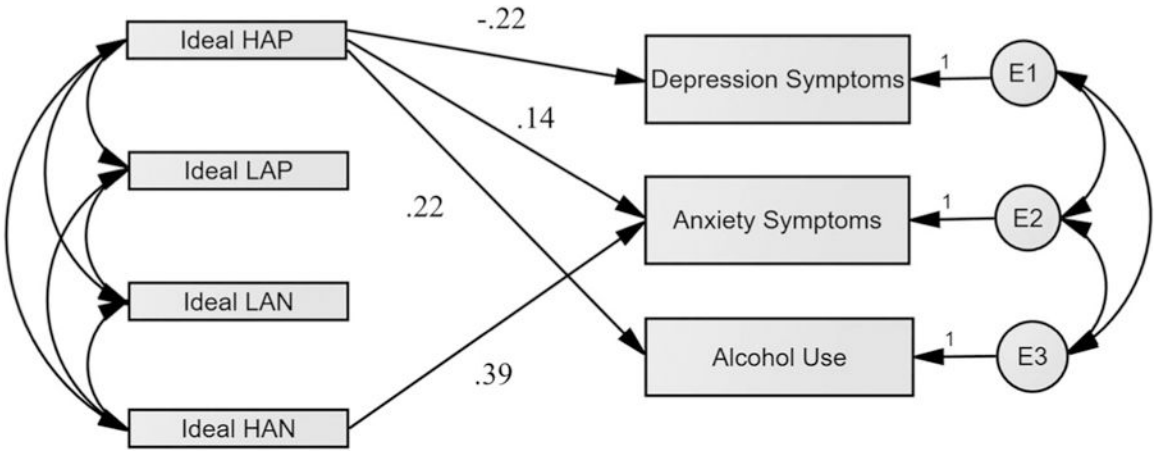

Figure 2.

Final model of the relationship between ideal affect and symptoms in Study 1 (*N* = 293). HAP = high arousal positive affect; LAP = low arousal positive affect; LAN = low arousal negative affect; HAN = high arousal negative affect.

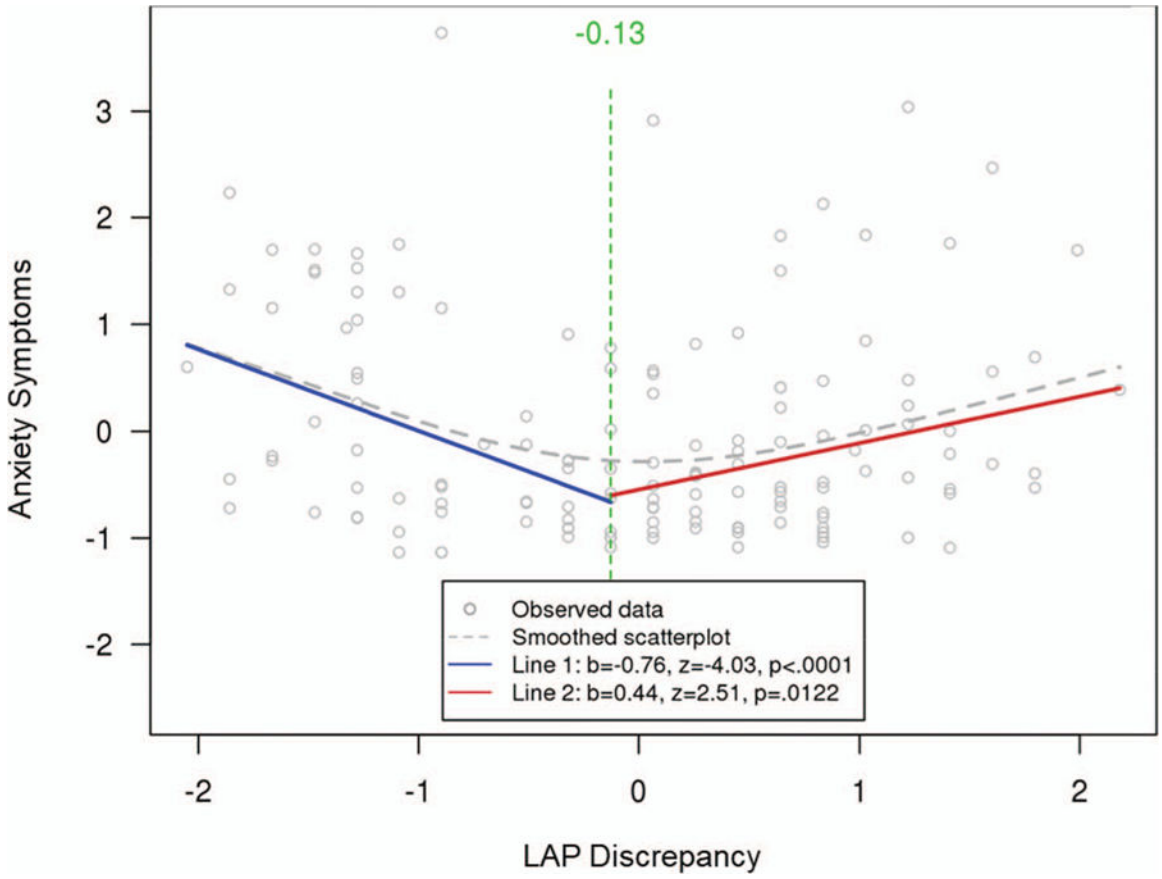

Figure 3.

Graphical representation of the two-line test of the effect of low arousal positive affect (LAP) discrepancy on anxiety symptoms in Study 2 (*N* = 146). See the online article for the color version of this figure.

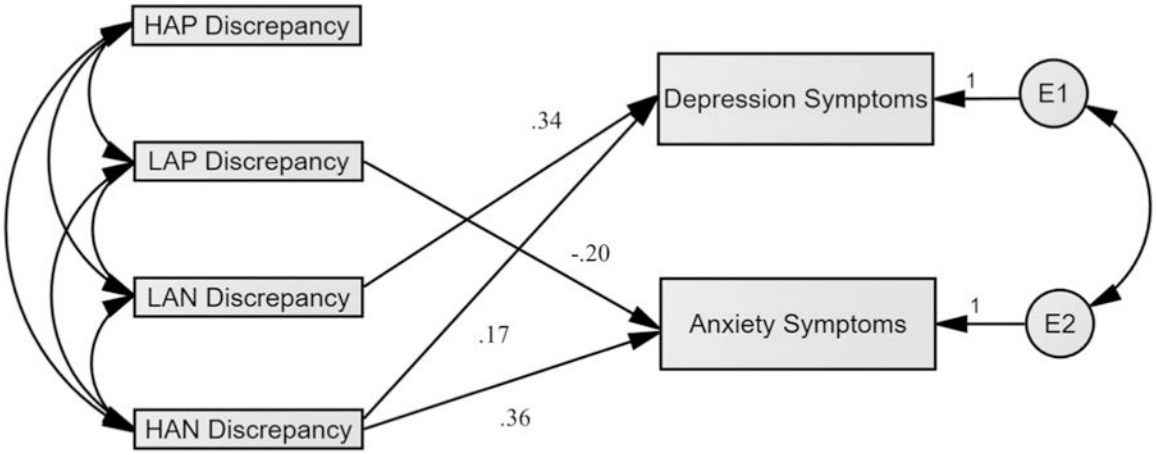

Figure 4.

Final model of the relationship between ideal–actual affect discrepancies and symptoms in Study 2 (*N* = 146). HAP = high arousal positive affect; LAP = low arousal positive affect; LAN = low arousal negative affect; HAN = high arousal negative affect.

Table 1

Zero-Order Correlations Among Ideal Affect and Clinical Symptoms in Study 1

Variable	2	3	4	5	6	7
1. Ideal HAP	.42***	−.54***	−.38***	−.22***	−.01	.22***
2. Ideal LAP	—	−.68***	−.69***	−.07	−.21***	.01
3. Ideal LAN		—	.78***	.21***	.32***	−.10†
4. Ideal HAN			—	.12*	.36***	−.03
5. MASQ–SF depression symptoms				—	.55***	.07
6. MASQ–SF anxiety symptoms					—	.24***
7. AUDIT alcohol use						—

Note. $N = 293$. HAP = high arousal positive affect; LAP = low arousal positive affect; LAN = low arousal negative affect; HAN = high arousal negative affect; MASQ–SF = Mood and Anxiety Symptoms Questionnaire—Short Form; AUDIT = Alcohol Use Disorders Identification Test.

† $p < .10$.

* $p < .05$.

*** $p < .001$.

Table 2

Zero-Order and Partial Correlations Among Actual Affect, Ideal Affect, and Clinical Symptoms in Study 2

Variable	2	3	4	5	6	7	8	9	10	11
1. Actual HAP	.61***	−.38***	−.09	.20*	−.24**	.29***	.36***	−.38***	.07	.13
2. Actual LAP	—	−.42***	−.22**	.17*	.02	.23**	.19*	−.41***	−.13	.04
3. Actual LAN		—	.43***	.07	.07	.02	−.05	.59***	.30***	.08
4. Actual HAN			—	−.02	−.26**	.37***	.40***	.45***	.62***	.12
5. Ideal HAP				—	.51***	−.31***	−.30***	−.11	−.02	.01
6. Ideal LAP					—	−.58***	−.68***	−.10	−.25**	−.16†
7. Ideal LAN						—	.83***	.15†	.41***	.21*
8. Ideal HAN							—	.13	.43***	.23**
9. MASQ–SF depression symptoms				−.04	−.10	.17*	−.06	—	.58***	.14†
10. MASQ–SF anxiety symptoms				−.03	−.25**	.42***	.26**		—	.33***
11. AUDIT alcohol use				−.02	−.16†	.21*	.20*			—

Note. $N = 146$. Data above the diagonal are zero-order correlations, and those below the diagonal are partial correlations between ideal affect and symptoms, controlling for the associated quadrant of actual affect. HAP = high arousal positive; LAP = low arousal positive; LAN = low arousal positive; HAN = high arousal positive; MASQ–SF = Mood and Anxiety Symptoms Questionnaire—Short Form; AUDIT = Alcohol Use Disorders Identification Test.

† $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3

Zero-Order Correlations Between Ideal–Actual Affect Discrepancies Variables and Symptom Variables in Study 2

Variable	2	3	4	5	6	7
1. HAP discrepancy	.65***	.56***	.50***	.23**	−.05	−.09
2. LAP discrepancy	—	.60***	.51***	.23**	−.05	−.14†
3. LAN discrepancy		—	.57***	.43***	.08	−.03
4. HAN discrepancy			—	.36***	.26**	−.13
5. MASQ–SF depression symptoms				—	.58***	.14†
6. MASQ–SF anxiety symptoms					—	.33***
7. AUDIT alcohol use						—

Note. $N = 146$. HAP = high arousal positive; LAP = low arousal positive; LAN = low arousal positive; HAN = high arousal positive; MASQ–SF = Mood and Anxiety Symptoms Questionnaire—Short Form; AUDIT = Alcohol Use Disorders Identification Test.

† $p < .10$.

** $p < .01$.

*** $p < .001$.