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Differential Predictability of Four Dimensions of Affect Intensity

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Abstract

Individual differences in affect intensity are typically assessed with the Affect Intensity Measure (AIM). Previous factor analyses suggest that the AIM is comprised of four weakly correlated factors: *Positive Affectivity, Negative Reactivity, Negative Intensity and Positive Intensity* or *Serenity*. However, little data exist to show whether its four factors relate to other measures differently enough to preclude use of the total scale score. The present study replicated the four-factor solution and found that subscales derived from the four factors correlated differently with criterion variables that assess personality domains, affective dispositions, and cognitive patterns that are associated with emotional reactions. The results show that use of the total AIM score can obscure relationships between specific features of affect intensity and other variables and suggest that researchers should examine the individual AIM subscales.

Keywords

affect intensity; Affect Intensity Measure; emotion; factor analysis

Affect intensity refers to individual differences in the strength or intensity of people's emotional experiences (Larsen & Diener, 1987). People who are high in affect intensity experience stronger emotions, display more frequent changes in mood, and show greater variability in their emotional states across time and situations than people who are low in affect intensity (Larsen, 1987; Larsen & Diener, 1987; Larsen, Diener, & Emmons, 1986). They also express their emotions more frequently (Goldsmith & Walters, 1989; Hunt, 1993) and intentionally regulate their emotions less often (Eisenberg & Okun, 1996). In part, high affect intensity may be sustained by the degree to which people view emotionally-evocative events as personally relevant and meaningful (personalization) and draw broad, unwarranted conclusions from specific events (generalization; Larsen, Diener, & Cropanzano, 1987). Affect intensity is also associated with viewing life events as more important (Schimmack & Diener, 1997), which can intensify people's emotional reactions to them (Diener, Colvin, Pavot, & Allman, 1991).

In addition to basic research on the characteristics of people who differ in affect intensity, affect intensity has been examined in studies of consumer behavior (Chang, 2006), reactions

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to justice and unfairness (van der Bos, Maas, Waldring, & Semin, 2003), and organizational conflict (Rhoades, Arnold, & Jay, 2001). Furthermore, research on the link between affect intensity and psychopathology shows that affect intensity is related to the risk for psychological problems that involve intense or labile emotions such as bipolar affective disorder, cyclothymia, and borderline personality disorder (Diener, Sandvik, & Larsen, 1985; Henry et al., 2001). (For a review of research on affect intensity, see Larsen, 2009.)

Most research on affect intensity has relied on the Affect Intensity Measure (AIM; Larsen & Diener, 1987), a 40-item self-report measure that asks respondents to rate how often they react to situations with strong emotions. In their original description of the AIM, Larsen and Diener (1987) reported five highly correlated factors but concluded that the scale was functionally unidimensional because the five factors were subsumed under a major second-order factor and the interitem reliability of the 40 items was quite high, with coefficient alpha exceeding .90. However, from the beginning, questions have been raised regarding whether the affect intensity construct is more fruitfully regarded as unidimenional or multidimensional.

In a principal components analysis of the AIM, Williams (1989) examined orthogonally rotated solutions ranging from three to seven components, settling on a four-component solution that reflected primarily the directly-worded and reverse-keyed items that dealt with positive and negative emotions. Weinfurt, Bryant, and Yarnold (1994) conducted confirmatory factor analyses to evaluate several models of the structure of the AIM. A four-factor model derived from exploratory factor analysis performed best. They labeled the factors in this model *Positive Affectivity, Negative Intensity, Serenity, and Negative Reactivity*. Given the relatively modest correlations between factors (M_r = .26), Weinfurt et al. concluded that using the sum of all 40 items as an index of affect intensity could produce misleading conclusions and recommended that researchers consider using scores on the four separate factors.

In later efforts to produce a cleaner factor structure, other analyses dropped the item set labeled *Serenity* by Weinfurt et al. (1994) and selected items from the other three factors (Bryant, Yarnold, & Grimm, 1996; Simonsson-Sarnecki, Lundh, & Törestad, 2000), but these analyses did not improve the fit of the reduced set of items and also changed the relationship of AIM scores to other variables compared with the original 40-item set. Attempts at fitting a second-order model with a general affect intensity factor were not successful.

Table 1 summarizes the results of six factor analyses of items from the AIM. The table arrays the items according to the factor with which they are most strongly associated in the analyses by Williams (1989), Weinfurt et al. (1994), Bryant et al. (1996), Simonsson-Sarnecki et al. (2000), and Rubin, Boals, and Bernsten (2008). (Note that not all of these studies included all 40 items.) In addition, we present in the last column the factor structure based on our analysis of data from the current study, to be described below. In general, the highest-loading items on the *Positive Affectivity* factor is “When I’m happy, I feel like I’m bursting with joy,” and the highest loading item on the *Negative Reactivity* factor is “When I do something wrong, I have strong feelings of shame and guilt.” The *Negative Intensity* factor is best identified by the item, “My friends would probably say I’m a tense or “high-strung” person,” and the *Positive Intensity* (reversed *Serenity*) factor is marked by the item, “I would characterize my happy moods as closer to contentment than to joy” (reverse-scored).[1]

[1]We use the label *Positive Intensity* rather than *Serenity* because, although the wording of all seven items that load on this factor reflects low *Positive Intensity*, or *Serenity*, all items are reverse-scored such that higher scores indicate greater affect intensity.

As can be seen, the agreement in the assignment of items to the four factors across analyses is substantial, although some ambiguity exists with the factor assignment of six items. Four of these items (13, 30, 36, and 39) load on the *Negative Reactivity* factor in some analyses but on the N*egative Intensity* factor in others. Item 13 ("When I talk in front of a group for the first time, my voice gets shaky and my heart races") does not load on any factor in two of the analyses and produced mixed results in the other four. Item 30 ("When I do feel anxiety, it is normally very strong") and item 39 ("When I am nervous, I get shaky all over") were assigned to the *Negative Reactivity* factor in one of the analyses and the N*egative Intensity* factor in the other five. Item 36 ("When I feel guilty, this emotion is quite strong") was assigned to the *Negative Reactivity* factor in the four analyses that use the full set of items but to the N*egative Intensity* factor in the two analyses that included only 27 items.

Despite these slight variations in factor structure across analyses, they converge on the conclusion that the AIM is composed of four weakly correlated factors. As Weinfurt et al. (1994) suggested, this situation raises the possibility that those factors relate to various psychological and interpersonal outcomes in different ways and that use of the total scale score may obscure or misrepresent the relationships between specific aspects of affect intensity and particular outcomes. In light of this concern, Larsen (2009) suggested that "in some situations, it may be appropriate to consider subscales within the 40-item AIM" (p. 243). However, few studies have done so (Rubin et al., 2008; Williams, 1989), and researchers who have examined correlates of the separate factors have often used items sets that differ from those on the original AIM (Geuens & de Pelsmacker, 2002).

Given the importance of the affect intensity construct and the demonstrated usefulness of the AIM in the study of emotion, our goal in the present study was to examine the relationships between the factors of the AIM and measures of personality, affect, and cognition. To assess the relationships between the AIM and broad dimensions of personality, we included measures of neuroticism, extraversion, openness, conscientiousness, and agreeableness. To measure affect, we assessed positive and negative affectivity, dysphoria, and emotion regulation. To examine cognition as it broadly relates to affect we included measures of self compassion, rumination, reflection, daydreaming, and suppression of intrusive thoughts. Because part of our initial interest in affect intensity was its potential to explain posttraumatic reactions to negative events we also examined measures of posttraumatic stress response and the centrality of traumatic events to people's identity. Understanding how dimensions of affect intensity relate to these measures of personality, affect, and cognition will both extend our understanding of affective intensity and address the question of whether researchers should use the total AIM score or separate subscale scores in future research.

Method

Participants

Participants were 433 undergraduates (268 females), who earned credit toward a course research-participation requirement. The participants identified themselves as White, n = 246; Black/African American, 47; Asian, 107; Hispanic, 16; and other 17.

Measures

Affect Intensity Measure—The Affect Intensity Measure (AIM; Larsen, Diener, & Emmons, 1986) is a 40-item questionnaire that measures individual differences in affect intensity. Sample items include "When I feel guilt, this emotion is quite strong," "My emotions tend to be more intense than those of most people," and "I can remain calm even

on the most trying days" (reverse-scored). The AIM has good internal consistency, test-test reliability, and criterion-related validity (Larsen et al., 1986).

Big Five Inventory—The Big Five Inventory (BFI; John, Donahue, & Kentle, 1991) is a 44-item measure of the broad personality domains of extraversion, neuroticism, agreeableness, conscientiousness, and openness. Each domain is assessed by eight to ten short phrases (e.g., conscientiousness: "Perseveres until the task is finished"). The reliability of the scales is high (typically > .80). Convergent and discriminant validity of the scales are well-established (John & Srivastava, 1999)

Positive and Negative Affect Schedule—The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) includes two 10-item subscales that measure the tendency to experience positive and negative affect. Participants rate their tendency to experience 10 positive feelings (*attentive, interested, alert, excited, enthusiastic, inspired, proud, determined, strong, active*) and 10 negative feelings (*distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, afraid*).

Beck Depression Inventory—The Beck Depression Index (BDI-II, Beck, Steer, & Brown, 1996) is probably the most widely used test of general depression severity. The 21 items assess various emotional manifestations of depression including sadness, hopelessness, irritability, and guilt, and physical symptoms such as fatigue, weight loss, and lack of interest in sex. A tremendous amount of research attests to its reliability and validity (Beck, Steer, & Brown, 1996)

PTSD Checklist—The Posttraumatic Stress Disorder Checklist (PCL, Blanchard, Jones-Alexander, Buckley, & Foneris, 1996; Weathers, Litz, Huska, & Keane, 1994) has participants nominate a specific stressful event and rate on five-point scales from not at all to extremely how much they have been bothered by it on each of 17 symptoms of PTSD identified in the DSM-IV.

Centrality of Event Scale—The Centrality of Event Scale (CES; Berntsen & Rubin, 2006, 2007) measures the extent to which a traumatic memory forms a central component of personal identity, a turning point in the life story, and a reference point for everyday inferences. The short form of the CES, which we used, consists of seven items rated in relation to the most stressful or traumatic event in the person's life.

Brief Self-compassion Scale—The Brief Self-Compassion Scale (Allen, Leary, & Goldwasser, 2009) is a 12-item version of Neff's (2003) 26-item Self-Compassion Scale, a measure of the degree to which people treat themselves with kindness and concern in the face of failure, rejection, loss, and other negative events. The interitem reliability is acceptable ($\alpha = .73$) and the brief scale correlates .83 with the original.

White Bear Suppression Inventory—The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) is a 15-item Likert-type scale that measures the general tendency to suppress unwanted negative thoughts. The WBSI shows good interitem reliability and construct and criterion-related validity (Muris, Merckelbach, & Horselenberg, 1996; Wegner & Zanakos, 1994).

Imaginal Processes Inventory—The Daydreaming Frequency and Frightened Reactions Daydreams scales (Singer & Antrobus, 1970) are two 12-item scales from the 28 scales of Singer and Antrobus' (1970) Imaginal Processing Inventory. The frequency of daydreams scale is a general measure of daydreaming activity, which can be seen as an

index of involuntary and intrusive thoughts. The frightened reactions scale focuses on the occurrence of emotionally negative daydreams.

Rumination and Reflection—The Rumination and Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999) measures two independent dimensions of self-attentiveness—rumination and reflection. Rumination involves the tendency to engage in recurrent thinking or ruminating about threats, losses, or injustices involving oneself as reflected in items such as, "I tend to 'ruminate' or dwell over things that happen to me for a really long time afterward" and "I spend a great deal of time thinking back over my embarrassing or disappointing moments." Reflection involves the tendency to reflect on oneself out of intrinsic interest or the enjoyment of abstract or philosophical musings. Examples of the self-reflection items include "I love exploring my 'inner' self" and "My attitudes and feelings about things fascinate me." Both scales show high interitem reliability and good convergent and discriminant validity (Joireman, Parrott, & Hammersla, 2002; Trapnell & Campbell, 1999).

Emotion Regulation Questionnaire—The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) consists of two subscales. The six-item reappraisal subscale assesses the degree to which people construe potentially emotion-producing situations in ways that modifies their emotional impact (e.g., "I control my emotions by changing the way I think about the situation I'm in"). The four-item suppression subscale assesses the degree to which people modulate or inhibit an ongoing emotionally expressive behavior (e.g., "I control my emotions by not expressing them"). Both scales show good evidence of interitem reliability as well as construct and criterion-related validity (Gross & John, 2003).

Procedure

The participants completed Web-based questionnaires at the beginning of an academic semester.

Results

Exploratory Factor Analysis of the AIM

Bartlett's test of sphericity yields strong evidence of commonality among the items, $\chi^2(780) = 8{,}160$, $p < .001$. Individual communalities, which ranged from .29 (item 21) to .73 (item 20; $M = .50$), are given in the rightmost column in Table 2. The value of .91 for the Kaiser-Meyer-Olkin measure of sampling adequacy indicates that the partial correlations are sufficiently smaller than their zero-order counterparts to justify factor analysis. We factored correlations among the set of 40 items (squared multiple correlations on the diagonal) using principal factors extraction.

As described earlier and shown in Table 1, previous factor analyses of the AIM have yielded four factors. Inspection of the scree plot showed a clear break between the fourth and fifth rank-ordered eigenvalues, and the fifth eigenvalue was the first to dip below 1.0. In addition, the first four factors accounted for 88% of the common variance, and subsequent factors added trivial explanatory power. On balance, these criteria favored four factors, which we extracted and obliquely rotated using direct oblimin[2].

[2]We also considered two additional criteria for determining the number of factors to extract: parallel analysis and maximum likelihood (Hoyle & Duvall, 2004). Both suggested a substantially larger number of factors than four—10 by parallel analysis and 11 by maximum likelihood. Although the numbers suggested by these methods satisfied certain statistical criteria, they did so at the sacrifice of parsimony and substantive meaningfulness. Any factors beyond four reflected substantially trivial sources of commonality such as common wording.

The full pattern matrix is shown in Table 2. With one exception, items are ordered according to magnitude of their loadings on the factor on which they load highest. (The exception is item 6, which double-loaded with a somewhat higher salient loading on the *Positive Affectivity* factor.) For interpretation, we used a salience criterion of .30; loadings that exceeded this criterion are set in bold typeface. The rotated solution generally yielded a simple structure and a pattern of salient loadings that corresponds closely to results from previous factor analyses of the full set of items. The *Negative Reactivity* and *Positive Intensity* factors were particularly clear, with all loadings well above threshold and no secondary loadings. The *Positive Affectivity* factor also was clear, with only a single off-loading that just exceeded threshold. Loadings of items on the *Negative Intensity* factor were well above threshold, but two items (6 and 15) loaded on the *Positive Affectivity* factor as well. Moreover, item 39, which has typically loaded on the *Negative Intensity* factor (see Table 1), loaded on the *Negative Reactivity* factor while failing to reach threshold on the *Negative Intensity* factor (loading = .22).

Following rotation, the *Positive Affectivity* factor accounted for 46% of the common variance ignoring the other factors. The *Negative Reactivity* factor accounted for 25% of the variance, and the *Positive Intensity* and *Negative Intensity* factors accounted for 19% and 17%, respectively. The interfactor correlations are provided near the bottom of Table 2. With the exception of a moderate correlation between *Positive Affectivity* and *Negative Reactivity* ($r = .42$) the correlations between the factors were small.

In summary and as shown in Table 1, our factor analysis generally replicated prior analyses of the full item set. All factor analyses that used the full item set found clear evidence for four modestly correlated factors. In terms of the pattern of loadings on the factors, there is substantial concordance between the results reported here and those from prior analyses. The lone exception is item 39 (“When I am nervous I get shaky all over”), which our analysis placed on the *Negative Reactivity* factor but which all prior analyses placed on the *Negative Intensity* factor.

Confirmatory Factor Analysis

We initially used exploratory factor analysis to examine the dimensionality of the AIM because of questions regarding the placement of some of the items on the factors. After generally replicating the 4-factor structure obtained in previous studies, we turned to confirmatory factor analysis to test this structure more directly. We initially specified four correlated first-order factors, assigning each item to a single factor according to the consensus evidenced in Table 1. This model did not offer an acceptable account of the data, $\chi^2(734, N = 425) = 2402.45$, $p < .001$, CFI = .78, RMEA = .073 (90% CL = .070, 076). Using the Lagrange multiplier (LM) test to search for misspecified parameters led us to free five cross-loadings, all of which reflected discrepancies in item placement across prior analyses. This modification resulted in a significant improvement in fit, $\Delta\chi^2(5) = 318.55$, $p < .001$, but the model still did not fit the data adequately, $\chi^2(729, N = 425) = 2083.90$, $p < .001$, CFI = .82, RMEA = .066 (90% CL = .063, 069). The LM test also identified a number of covariances that, if freed, would significantly improve model fit. We elected to free, in order of magnitude, those covariances necessary to meet standard fit criteria. The resultant model both offered an adequate account of the data, $\chi^2(705, N = 425) = 1470.49$, $p < .001$, CFI = .90, RMEA = .051 (90% CL = .047, 054), and significant improvement over the model with cross-loadings, $\Delta\chi^2(24) = 613.41$, $p < .001$.

Taking this model as our best representation of the first-order model, we next estimated a model in which the commonality among the four first-order factors was accounted for by a single second-order factor. This model is nested in the first-order model and the χ^2-difference test evaluates whether a second-order factor is justified. The test was highly

significant, $\Delta\chi^2(2) = 113.45$, $p < .001$, indicating that the first-order model offers a superior account of the data. Thus, the confirmatory factor analysis suggests that the four subscales do not reflect a higher-order latent variable.

Correlations between Dimensions of the AIM and Other Constructs

To examine the utility of the one- and four-factor accounts of affect intensity, we produced a composite score of all items on the AIM and a set of four subscale scores corresponding to the item array in Table 1. For the small number of items that did not load on the same factor across all factor analyses, we assigned the item to the subscale corresponding to the factor on which it loaded in the majority of analyses. The subscales are: *Positive Affectivity* (Items 1, 2, 3, 5, 7, 8, 9, 10, 14, 18, 20, 22, 23, 27, 32, 35, 38), *Negative Reactivity* (Items 4, 11, 13, 17, 21, 25, 36), *Negative Intensity* (Items 6, 15, 19, 26, 28, 30, 31, 34, 39), and *Positive Intensity* (12, 16, 24, 29, 33, 37, 40). As can be seen in Table 3, the internal consistency of the item sets was generally good. Correlations between subscales and between the subscales and the total AIM score are shown in the top portion of Table 4. The correlations between factors are small to moderate, and include one negative correlation.

Table 4 shows the zero-order correlations of the AIM total score and the four subscale scores with the other constructs. Of specific interest is the relative magnitude of coefficients within a row, which shows the degree to which the four subscales are related similarly or differently to the criterion measures. For instance, in the row for Neuroticism, the correlation between Neuroticism and the total AIM scale is .32. However, the remaining correlations in the row show disparate correlations between neuroticism and the four subscales, two of which are nonsignificant, one of which is moderate in magnitude ($r = .35$), and one of which is quite strong ($r = .72$). (The full scale and subscale values cannot be compared statistically because of the item overlap between the full scale and subscales.) In this instance, using the total scale score instead of subscale scores would result in a significant underestimation of the association between certain aspects of affect intensity and neuroticism.

As seen in Table 4, the total AIM score correlated significantly with 16 of the criterion variables, but inspection of the within-row correlations shows that the four AIM subscales showed different patterns of correlations. Indeed, for none of the 19 variables did all four subscales correlate significantly in the same direction. Most notably, the *Positive Intensity* subscale correlated with only two of the measures—Extraversion (positively) and White Bear Suppression Inventory (negatively), leading us to agree with previous suggestions that it does not assess the same core features of affect intensity as measured by the other factors. Thus, we focus here on only the other three subscales—*Positive Affectivity, Negative Reactivity*, and *Negative Intensity*.

Setting aside gender (women scored higher on the three subscales than men), the six other measures with which the *Positive Affectivity*, *Negative Reactivity*, and *Negative Intensity* subscales correlated were the PTSD Checklist, Centrality of Event, White Bear Suppression Inventory, Daydreaming (both the frequency and fright subscales), and Rumination.

In contrast, four constructs—Neuroticism, Negative Affectivity, Beck Depression Inventory, and Self-Compassion—correlated with *Negative Reactivity* and *Negative Intensity* but not with *Positive Affectivity*. The positive affect subscale of the PANAS and the reappraisal subscale of the ERQ correlated positively with *Positive Affectivity* and negatively with *Negative Reactivity* but were uncorrelated with *Negative Intensity*. Agreeableness correlated positively with *Positive Affectivity* and *Negative Reactivity* but negatively with *Negative Intensity*. Thus, different measures showed quite different patterns of correlations with the AIM subscales, again suggesting that they are probably measuring different constructs.

Table 5 presents results from a series of multiple regression analyses in which we regressed each of the measures on the set of four AIM subscales. For comparison, the first column presents the R^2 for the full AIM. In the second column, we provide the total R^2 for each regression equation. In the subsequent four columns, we present the squared semi-partial correlation coefficients for each term in each equation. These values resulted from Type II estimation, in which the influence of each predictor is estimated controlling for all others in the model. Thus, these values represent the unique variance in each outcome variable attributable to each AIM subscale. The last column results from subtracting the sum of the squared semi-partial correlations from the total R^2 and provides a rough estimate of the variance in the outcome variable that is attributable to variance that is common to all four AIM subscales.

As seen in Table 5, the AIM subscales predicted a substantial proportion of variance (> 20%) in a number of variables, particularly Neuroticism, Extraversion, Agreeableness, Positive Affect, Negative Affect, Self-Compassion, Daydreaming Fright, and Rumination. Importantly, the proportion of variance accounted for in these analyses by the set of AIM subscales is much higher than reflected by the zero-order correlations between the total AIM score and the various outcome variables. For example, although the total AIM score accounted for only 10% of the variance in Neuroticism, the four subscales accounted for 60% of the variance in Neuroticism in the regression analyses reported in Table 5. In part, the greater predictability of the subscales reflects the fact that, as noted, the subscales bear different relationships to the outcome variables that are obscured when the total score is used.

The last column of Table 5 shows the proportion of variance in the outcome variables that is attributable to variance shared by the four AIM subscales. Conceptually, this variance may be roughly regarded as due to the latent variable that underlies the variance that is shared by the four subscales (as reflected in their correlations with each other) — the core of affect intensity that is common across subscales. As can be seen, the proportion of shared variance is consistently low (≤ .06). Even the highest proportion (for Neuroticism) shows that only 10% of the total variance in neuroticism accounted for by the four subscales is due to variance that one or more subscales share with each other. The low proportions of shared variance in these analyses provide additional evidence that the subscales are not measuring the same construct.

It is also worth considering whether the subscales are, to any significant degree, measuring constructs besides affect intensity. Returning to Table 4 and scanning the columns for the subscales suggests this might be the case for one of the four subscales — *Negative Intensity*, which is correlated $r = .72$ with Neuroticism. To further examine the overlap between these two constructs, we conducted a hierarchical multiple regression analysis. The results are shown in Table 6. At Step 1, we regressed Neuroticism on the variables with which *Negative Intensity* correlated most highly. As can be seen in the first column of numbers in the table, the proportions of variance accounted for were highly significant and small to large in magnitude. At Step 2, we added *Negative Intensity* to the model and computed R^2 change. These values are provided in the last column in Table 6. Although four of the ten are statistically significant, the largest value is $R^2 = .03$. Moreover, six of the R^2 increments are, in effect, zero. These results suggest that, empirically, *Negative Intensity* cannot be distinguished from neuroticism.

Discussion

Our results replicated previous factor analyses showing that the AIM is composed of four factors that are reasonably consistent across studies (Bryant et al., 1996; Rubin et al., 2009;

Simonsson-Sarnecki et al., 2000; Weinfurt et al., 1994; Williams, 1989), and a confirmatory factor analysis verified the superiority of this 4-factor structure over a model that assumed a higher-order latent variable. The findings also demonstrated that subscales derived from these four factors relate differently to an array of emotional, cognitive, and personality variables. differences in affect intensity.

Conceptualization of the Four AIM Factors

Weinfurt et al. (1994) distinguished between *intensity* (the strength of people's emotional reactions) and *reactivity* (how easily people's emotions are triggered by events and experiences), and maintained that affect intensity and reactivity, while correlated, are conceptually and empirically distinct. We agree with this distinction but question whether the *Negative Reactivity* and *Negative Intensity* factors actually assess reactivity and intensity, respectively.

Rather than assessing reactivity, the *Negative Reactivity* factor appears to be a relatively direct operationalization of Larsen and Diener's (1987) conceptualization of affect intensity. The items that load highest on the *Negative Reactivity* factor involve the degree to which people report that they experience strong negative emotions including intense guilt, sadness, anxiety, and queasiness. Although many of the items refer to reactions to particular situations and experiences (such as seeing others who are hurt and watching sad movies), most of the items ask respondents to rate how often they experience intense negative emotions in these situations (intensity) and not how strong of an event is needed to trigger the emotions or how easily they experience them (reactivity). Thus, referring to this factor as reactivity is potentially misleading. To us, it appears to reflect affect intensity with respect to negative emotions.

The items that load highly on the *Negative Intensity* factor differ from those on the *Negative Reactivity* factor in two ways, neither of which map on to the intensity-reactivity distinction. First, rather than referring to specific situations as most of the *Negative Reactivity* items do, the *Negative Intensity* items involve mostly global statements about one's tendency to react intensely versus calmly. For example, high-loading items include: *My friends would probably say that I'm a tense or "high-strung" person, My negative moods are mild in intensity,* and *When I get angry it's easy for me to still be rational and not overreact.* Second, many of the items on the *Negative Intensity* factor deal with reacting calmly as opposed to overreacting. Given that many of the highest loading items deal with calmness and equanimity, labeling this factor as "Negative" Intensity is misleading. Rather than differing with respect to reactivity and intensity, the *Negative Reactivity* and *Negative Intensity* factors both appear to reflect affect intensity, albeit in somewhat different ways.

The *Positive Affectivity* factor is a relatively straightforward measure of affect intensity with respect to positive emotions. The items that load highly on this factor reflect the degree to which people report experiencing strong positive emotions such as jubilance, delight, joy, enthusiasm, exuberance, and euphoria.

Like previous studies, we found that the *Positive Intensity* (or *Serenity*) factor did not appear to measure the same construct as the other three factors. This factor reflects the degree to which people experience positive affect that is something other than contentment or inner calm as reflected in low scores on items such as *I would characterize my happy moods as closer to contentment than to joy* and *When I feel happiness, it is a quiet type of contentment*. We are not certain whether the items assess differences in the intensity of people's positive moods or in the nature of the positive emotions that they experience. Highly contented people might score relatively high on the scale, for example, irrespective of their level of affect intensity. Also, it is unclear whether positive emotions such as calm

or contentment can be experienced strongly or intensely (Rubin & Talarico, 2009). As noted, some researchers have suggested that the items labeled *Positive Intensity* here and *Serenity* in prior research do not measure affect intensity and, in fact, deleted them from their analyses (Bryant et al., 1996; Simonsson-Sarnecki et al., 2000), and we agree that this is the most problematic of the four factors with respect to affect intensity. However, the *Positive Intensity* items are interesting in their own right and deserve additional attention.

Correlates of the Four Factors

The patterns of correlations among the four AIM factors and between the AIM factors and the other measures suggest that the subscales do not strongly measure a common underlying variable. The correlations among the subscales were modest, with correlations between *Positive Intensity* and the other AIM subscales notably weaker than the others. Although the correlations among *Positive Affectivity, Negative Reactivity*, and *Negative Intensity* suggest that they share common variance, these correlations,(which were similar to those obtained by Weinfurt et al. (1994), are not as high as one might expect if they measured facets of the same general construct.

More importantly, correlations between the AIM subscales and the criterion measures revealed only meager evidence of convergence in terms of their relationships with other constructs. Only two of the 19 correlations with *Positive Intensity* were significant, and *Positive Intensity* correlated similarly to the other AIM subscales only with respect to suppression. Given that *Positive Intensity* correlated weakly with the other subscales (and negatively with *Negative Reactivity*) and does not bear the same relationships with the other measures as the other three factors, we agree with Bryant et al. (1996) and Simonsson-Sarnecki et al. (2000) that including *Positive Intensity* items in the assessment of affect intensity is problematic. In our view, the construct measured by the *Positive Intensity* items (when not reverse-scored) may be one outcome of being low in affect intensity. People who are lower in affect intensity naturally tend to feel more relaxed, contented, peaceful, and untroubled than those who are higher.

The other three AIM subscales bear varying relationships to the other measures. All three subscales correlated with 7 of the 19 constructs in the same direction. Most of these measures (Rumination, Daydreaming, White Bear Suppression Inventory, Centrality of Event, and the PTSD Checklist) involve cognitive processes that might be expected to be associated with stronger emotions. In contrast, four constructs correlated with *Negative Reactivity* and *Negative Intensity* but not with *Positive Affectivity*. Three of these involve tendencies to experience negative emotions (neuroticism, negative affect, and depression). In fact, *Negative Intensity* correlated so highly with neuroticism ($r = .72$), that they might be regarded as alternative measures of the same construct. *Negative Reactivity* and *Negative Intensity* also correlated negatively with self-compassion. People who are higher in self-compassion experience negative emotions less frequently and less intensely (Leary, Adams, Tate, Allen, & Hancock, 2007).

The variables that involve positive emotionality showed different patterns of correlations with the AIM subscales. *Positive Affectivity* correlated positively with the positive affect subscale from the PANAS and negatively with *Negative Intensity*, a pattern that was also obtained for the reappraisal subscale of the ERQ. The latter finding is consistent with research showing that cognitive reappraisal is associated with higher positive emotion and lower negative emotion (Gross & John, 2003). Extraversion correlated positively with *Positive Affectivity* and negatively with *Negative Reactivity*, in line with research showing that extraversion is associated with the tendency to experience positive affect (Watson & Clark, 1992).

Agreeableness correlated positively with *Positive Affectivity* and *Negative Reactivity* but negatively with *Negative Intensity*. The finding that agreeable people react more strongly than less agreeable people is consistent with research showing that people high in agreeableness experienced stronger reactions to emotionally-evocative images but also exerted greater effort to control these reactions (Tobin, Graziano, Vanman, & Tassinary, 2000). This pattern suggests that, although agreeable people tend to experience their emotions more strongly than less agreeable people, their efforts to regulate their emotions lead them to see themselves as less reactive.

Comparing the patterns of correlations for the AIM subscales with those for the total AIM score clearly shows that using the total score masks the nuanced patterns that emerge for the subscales. For some measures, a significant correlation with the total AIM score obscured the fact that the effect was pulled by certain dimensions but not others. For other measures, a significant correlation with the total AIM score belied the fact that some subscales were positively related and others were negatively related to the construct. In a third pattern, weak or nonsignificant correlations with the total AIM score sometimes hid the fact that significant correlations were obtained for certain subscales. In all of these cases, relying on the total scale would result in misleading conclusions regarding the true relationships.

Recommendations and Conclusions

Overall, the patterns of results suggest that researchers should generally not rely only the AIM total score. Although three of the AIM subscales share variance and sometimes show similar patterns of relationships with other measures, correlations were often significant for only one or two of the subscales, and in some instances, the subscales correlated significantly in different directions. In addition, the fact that the subscales have different numbers of items (nearly half of the items on the AIM are *Positive Affectivity* items), the total AIM score reflects *Positive Affectivity* much more strongly than *Negative Reactivity, Negative Intensity*, or *Positive Intensity*.

Nothing we have said should be taken to suggest that affect intensity is not an important individual difference variable, and, in fact, research shows that it is (Larsen, 2009). And, in many instances, the total AIM score may reflect the general strength or intensity of people's emotional experiences. Our major point is that even when researchers wish to present results from the total AIM for comparisons with previous findings, they should report subscale data as well. Furthermore, where data already exist, previous full-scale results should be reexamined in terms of the four subscales. Analyzing data collected with the AIM at both the level of the total score and of the four subscales not only avoids drawing misleading conclusions but also allows a more fine-grained analysis of the features of affect intensity.

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Table 1

Alignment of Affect Intensity Measure items with Positive Affectivity (PA), Negative Reactivity (NR), Negative Intensity (NI), and S(PI) factors based on published results of principal components and factor analyses

Item	Williams (1989)[a]	Weinfurt et al. (1994)[b]	Bryant et al. (1996)[c]	Simonsson-Sarnecki et al. (2000)[c]	Rubin et al. (2008)[a]	New Sample[d]
			Positive Affectivity			
1	PA	PA	PA	PA	PA	PA
2	PA	PA	PA	PA	PA	PA
3	PA	PA	--	PA	PA	PA
5	PA	PA	PA	PA	PA	PA
7	PA	PA	PA	PA	PA	PA
8	PA	PA	PA	PA	PA	PA
9	PA	PA	PA	PA	PA	PA
10	PA	PA	PA	PA	PA	PA
14	PA	PA	PA	PA	PA	PA
18	PA	PA	PA	PA	PA	PA
20	PA	PA	PA	PA	PA	PA
22	PA	PA	PA	PA	PA	PA
23	PA	PA	PA	PA	PA	PA,NR
27	PA	PA	PA	PA	PA	PA
32	PA	PA	--	PA	PA	PA
35	PA	PA	PA	PA	PA	PA
38	PA	PA	PA	PA	PA	PA
			Negative Reactivity			
4	NR	NR	NR	NR	NR	NR
11	NR	NR	NR	NR	PA	NR
13	*	NI	NR	NR	*	NR
17	NR	NR	NR	NR	NR	NR
21	NR	NR	NR	NR	NR	NR
25	NR	NR	NR	NR	NR	NR
36	NR	NR	NI	NI	NR	NR
			Negative Intensity			
6	NI	NI	NI	--	NI,PA	NI, PA

Item	Williams (1989)[a]	Weinfurt et al. (1994)[b]	Bryant et al. (1996)[c]	Simonsson-Sarnecki et al. (2000)[c]	Rubin et al. (2008)[a]	New Sample[d]
15	NI	NI	NI	--	NI,PA	PA,NI
19	NI	NI	--	--	NI	NI
26	NI	NI	--	--	NI	NI
28	NI	NI	--	--	NI	NI
30	NR	NI	NI	NI	NI	NI
31	NI	NI	--	--	NI	NI
34	NI	NI	NI	NI	NI	NI
39	NI	NI	NI	NI	NI	NR
			Positive Intensity			
12	PI	PI	--	--	PI	PI
16	PI	PI	--	--	PI	PI
24	PI	PI	--	--	PI	PI
29	PI	PI	--	--	PI	PI
33	PI	PI	--	--	PI	PI
37	PI	PI	--	--	PI	PI
40	PI	PI	--	--	PI	PI

Note. Double entries indicate item with a secondary loading on the factor listed second;

[*] denotes item that did not exceed salience criterion on any factor in that analysis;

-- denotes item excluded from that factor analysis

[a] principal components analysis with Varimax rotation and .4 salience criterion

[b] principal components analysis with Promax rotation followed by confirmatory factor analysis

[c] confirmatory factor analysis using 27 items chosen a priori (2 of 27 differ between the Bryant et al. and Simonsson-Sarnecki et al. studies)

[d] principal axes factor analysis with Varimax rotation and .4 salience criterion

Table 2

Obliquely-Rotated Factor Structure of Items of the Affect Intensity Measure

Item	Positive Affectivity	Negative Reactivity	Negative Intensity	Positive Intensity	h^2
7	**.83**	−.13	.08	−.15	.60
14	**.82**	−.14	.11	−.03	.61
20	**.81**	.05	.01	.03	.70
35	**.75**	.02	.11	.10	.64
8	**.74**	−.11	.24	−.03	.56
27	**.71**	.07	−.13	.03	.56
2	**.70**	.04	−.16	.13	.55
22	**.66**	.09	−.08	.02	.49
10	**.60**	.12	−.05	−.02	.43
5	**.60**	.19	−.07	−.07	.48
18	**.58**	.18	−.12	.02	.46
32	**.57**	.03	.10	.12	.40
9	**.51**	.21	−.16	.17	.43
38	**.48**	.13	.13	−.01	.33
23	**.43**	**.31**	−.06	.14	.40
3	**.43**	.03	−.23	.09	.24
1	**.39**	.29	−.29	.26	.42
36	−.04	**.72**	.12	−.05	.56
25	.02	**.66**	.06	−.08	.49
17	.07	**.58**	−.03	.02	.36
4	.01	**.55**	−.12	−.04	.31
11	.21	**.43**	.14	−.01	.34
39	.04	**.39**	.22	−.09	.26
21	.16	**.35**	.03	−.03	.20
13	−.05	**.34**	.10	−.10	.15
34	.19	.01	**.64**	−.19	.47
31	−.05	.06	**.59**	.14	.39
26	−.16	.16	**.58**	.26	.45
19	−.02	−.03	**.55**	.29	.42

Item	Positive Affectivity	Negative Reactivity	Negative Intensity	Positive Intensity	h^2
28	−.09	.08	**.54**	.20	.36
30	.07	.28	**.52**	−.14	.44
15	**.38**	.09	**.51**	.00	.49
6	**.55**	.00	**.42**	−.06	.51
37	.20	−.09	.02	**.71**	.62
33	.19	−.07	.15	**.70**	.63
40	.22	−.18	.20	**.65**	.63
29	.16	−.06	.11	**.64**	.51
24	.05	.00	.20	**.60**	.44
12	−.11	−.08	−.03	**.43**	.20
16	−.11	−.02	−.06	**.39**	.16
Interfactor Correlations					
Positive Affectivity		.42	.09	.17	
Negative Reactivity			.15	−.18	
Negative Intensity				.10	

Note. Boldface type indicates loading > .30.

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Table 3

Descriptive Statistics

Scale/subscale	Mean	SD	α
Affect Intensity Measure			
Positive affectivity	3.84	0.75	.93
Negative reactivity	3.78	0.79	.76
Negative intensity	3.17	0.71	.81
Positive Intensity	3.48	0.67	.81
Total	3.62	0.52	.91
Big Five Inventory			
Neuroticism	2.88	0.77	.85
Extraversion	3.28	0.82	.89
Openness	3.46	0.59	.80
Conscientiousness	3.59	0.67	.85
Agreeableness	3.73	0.59	.79
Positive and Negative Affect Schedule			
Positive affect	3.49	.72	.89
Negative affect	1.96	.72	.90
Beck Depression Inventory	3.90	4.48	.84
PTSD Checklist	29.72	11.77	.92
Centrality of Event Scale	2.55	1.15	.93
Self-Compassion Scale (Brief)	2.96	0.61	.61
White Bear Suppression Inventory	2.81	0.83	.93
Imaginal Processes Inventory			
Daydreaming frequency	2.75	0.86	.94
Daydreaming fright	1.88	0.57	.83
Rumination and Reflection Questionnaire			
Rumination	3.21	0.78	.88
Reflection	3.31	0.81	.90
Emotion Regulation Questionnaire			
Reappraisal	4.65	0.90	.83
Suppression	3.65	1.16	.79

Table 4

Correlations of AIM Scale and Subscales with Other Variables

	Total Score	Positive Affectivity	Negative Reactivity	Negative Intensity	Positive Intensity
Affect Intensity Measure					
Positive affectivity	.89				
Negative Reactivity	.60	.44			
Negative Intensity	.67	.34	.38		
Positive Intensity	.39	.23	−.15	.22	
Big Five Inventory					
Neuroticism	.32	.03	.35	.72	−.03
Extraversion	.27	.35	−.12	.06	.32
Openness	.09	.17	.00	−.07	.00
Conscientiousness	.06	.11	.10	−.08	−.05
Agreeableness	.10	.19	.22	−.25	.00
Positive & Negative Affect Schedule					
Positive affect	.21	.36	.05	−.12	.05
Negative affect	.24	.07	.24	.42	.02
Beck Depression Inventory	.08	−.06	.16	.28	−.07
PTSD Checklist	.25	.12	.22	.37	.03
Centrality of Event Scale	.18	.10	.20	.25	−.02
Self-Compassion Scale (Brief)	−.17	.08	−.18	−.55	.02
White Bear Suppression Inventory	.24	.13	.21	.36	−.04
Imaginal Processes Inventory.					
Daydreaming frequency	.15	.10	.14	.21	−.05
Daydreaming fright	.29	.15	.21	.44	.03
Rumination & Reflection Questionnaire					
Rumination	.30	.11	.31	.53	−.06
Reflection	.14	.17	.11	.00	.01
Emotion Regulation Questionnaire					
Reappraisal	−.05	.23	.06	−.24	−.09
Suppression	−.30	−.26	−.04	−.21	−.31
Gender (0 = male, 1 = female)	.22	.12	.30	.22	−.02

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Note. Coefficients are significant at $p < .05$ if greater than .09, $p < .01$ if greater than .12, and $p < .001$ if greater than .15.

Table 5

Variance Accounted for in a Multiple Regression Analysis of the Four AIM Subscales

Scale/subscale	AIM Full Scale R^2	Source of Variance in Prediction[a]					
		Total R^2	Positive Affectivity	Negative Reactivity	Negative Intensity	Positive Intensity	Shared Variance[b]
Big Five Inventory							
Neuroticism	.10	.60	.05	.02	.46	.01	.06
Extraversion	.07	.24	.14	.05	.00	.03	.02
Openness	.01	.05	.05	.00	.01	.00	−.01
Conscientiousness	.00	.04	.01	.01	.02	.00	.00
Agreeableness	.01	.23	.02	.07	.17	.01	−.04
Positive & Negative Affect Schedule							
Positive affect	.04	.20	.16	.00	.05	.00	−.01
Negative affect	.06	.20	.01	.01	.13	.00	.05
Beck Depression Inventory	.01	.13	.03	.01	.08	.00	.01
PTSD Checklist	.06	.14	.00	.01	.09	.00	.04
Centrality of Event Scale	.03	.08	.00	.01	.04	.00	.03
Self-Compassion Scale (Brief)	.03	.40	.07	.00	.33	.00	.00
White Bear Suppression Inventory	.06	.15	.00	.00	.10	.01	.04
Imaginal Processes Inventory							
Daydreaming frequency	.02	.06	.00	.00	.03	.01	.02
Daydreaming fright	.08	.20	.00	.00	.15	.00	.05
Rumination & Reflection Questionnaire							
Rumination	.09	.32	.01	.01	.23	.02	.05
Reflection	.02	.04	.02	.00	.01	.00	.01
Emotion Regulation Questionnaire							
Reappraisal	.00	.18	.09	.00	.10	.01	−.02
Suppression	.09	.14	.03	.00	.01	.05	.05
Gender (0 = male, 1 = female)	.05	.11	.00	.05	.01	.00	.05

Note.

[a] squared semi-partial correlations from an analysis with all four subscales entered as predictors

[b] Shared variance was calculated by subtracting the sum of the squared semi-partial correlations from total R^2

Table 6

Proportion of Variance in Selected Variables Shared with Negative Intensity After Accounting for Variance Shared with Neuroticism.

Independent Variable	R^2 Change	
	N	**Negative Intensity**
Positive & Negative Affect Schedule		
Negative affect	.31****	.00 ns
Beck Depression Inventory	.19****	.00 ns
PTSD Checklist	.16****	.01**
Centrality of Event Scale	.08****	.00 ns
Self-Compassion Scale (Brief)	.40****	.02****
White Bear Suppression Inventory	.20****	.00 ns
Imaginal Processes Inventory		
Daydreaming frequency	.06****	.00 ns
Daydreaming fright	.19****	.03****
Rumination & Reflection Questionnaire		
Rumination	.38****	.02***
Emotion Regulation Questionnaire		
Reappraisal	.08****	.00 ns

Note.

** p < .01.

*** p < .001.

**** p < .0001.

ns p > .05..