Comparing Static and Dynamic Measures of Affect Intensity and Affective Lability: Do they
Measure the Same Thing?

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This manuscript is currently in press at *Motivation and Emotion*. The version provided here has been peer-reviewed but is pre copy editing.

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Data will be made publicly available via Open Science Framework and can be accessed via the following URL: https://osf.io/d2vnm/?view_only=1ab9c970649b48668d4aadb2af4a8d3d.

We would like to acknowledge Christopher G. Mayne for contributing scripts to synthesize study data.

Abstract

This was the first study to our knowledge to examine whether dispositional scales of affect intensity and affective lability map on to corresponding momentary affective dynamics. Specifically, we assessed whether the Affect Intensity Measure (AIM) and Affective Lability Scale (ALS) are differentially associated with mean, variability, and instability of negative affect (NA) and positive affect (PA). Young adults ($n = 135$) completed the AIM, ALS, and 7 days of experience sampling assessments. Higher scores on the AIM were associated with variability and instability of NA and PA whereas the ALS was associated with mean levels of NA and PA. Neither the AIM nor the ALS were associated with reactivity to stressful, negative, or positive experiences in the moment. However, the AIM and ALS accounted for little variance in momentary affective dynamics and effects were generally small. Findings highlighted that static measures of dynamic phenomena poorly map onto momentary measures of affect in daily life. Theoretical and methodological implications are discussed.

Keywords: affective lability, affect intensity, experience sampling methodology, affective dynamics

Introduction

Affect intensity and affective lability represent dynamic psychological phenomena related to well-being and psychopathology (Larsen, Augustine, & Prizmic, 2009; Lewis, 2005; Scherer, 2000). Yet, these processes have historically been assessed using static measures that only approximate dynamic phenomenon by assessing one's general disposition (Wright & Hopwood, 2016). Two such dispositional scales, the Affect Intensity Measures (AIM; Larsen, 1985; Larsen, Diener, & Emmons, 1986) and Affective Lability Scale (ALS; Harvey, Greenberg, & Serper, 1989) are well-validated measures that were developed to assess individual differences in affect intensity and affective lability. However, since their development, advances in ambulatory assessment methods such as experience sampling methodology (ESM) now allow for the more direct estimation of moment-to-moment affective dynamics that capture intensity and lability. As such, the present study aimed to assess whether people who are high in dispositional affect intensity and affective lability, as measured by the AIM and ALS, are more likely to report affect intensity and affective lability in their daily lives as measured by ESM.

The AIM was developed to assess individual differences in *affect intensity*, the magnitude or strength of an individual's affective response (Larsen & Diener, 1987). An individual high in affect intensity has a tendency or disposition to experience strong negative and positive affect (Larsen, 1987; Schimmack & Diener, 1997). In previous daily diary studies, affect intensity, as measured by the AIM, was associated with higher average daily levels of negative and positive affect, as well as a greater amplitude in affect reported across time (Diener et al., 1985; Larsen & Diener, 1985) indicating that they may experience more variable affect. Furthermore, individuals high in dispositional affect intensity are also more likely to

experience strong reactions to affective perturbations (Zelkowitz & Cole, 2016). In fact, Larsen et al. (1986) reported that those high on the AIM were more likely to have strong reactions to extreme, moderate, and low levels of affective stimulation in daily life and lab-based tasks. Thus, those high in dispositional affect intensity, as measured by the AIM, are more likely to display higher levels of negative and positive affect, greater variability and affective reactivity, and greater reactivity to emotion-eliciting events in daily life.

The ALS was developed to measure individual differences in *affective lability* or the frequency of intense emotional shifts (Harvey et al., 1989). Affective lability is often referred to and conceptualized as “instability” of mood and the ALS aims to capture the changeability or fluctuations between core affect (normal mood) and four affect states: depression, elation, anger, and anxiety. Individuals high in affective lability, as measured by the ALS, have a predisposition to switch from one affective state to another quite rapidly following perturbation (Siever & Davis, 1991) such that they have frequent and large fluctuations in mood from one context to the next (Eid & Diener, 1999). Thompson, Berenbaum, and Bredemeier (2011) specifically highlighted that in daily life, those high in affective lability should show reactivity to both pleasant and unpleasant events in the form of affective fluctuations. So, although affective lability is proposed as a distinct construct from affect intensity, those who are high in affective lability should also, on average, have higher levels of affective reactivity (Eid & Diener, 1999).

Importantly, affect intensity and affective lability are proposed as two distinct dimensions of one’s emotional disposition (Harvey et al., 1989). Consistent with this view the correlation between the AIM and ALS tends to be small in non-clinical samples (e.g.,

undergraduate students, $r's = .20-.26$; Oliver & Simons, 2004). However, in clinical samples, the correlation between the AIM and ALS appears to be in the moderate to large range ($r's = .41 - .61$; Henry et al., 2008; Look et al., 2010; Oliver & Simons, 2004). Thus, it is possible that for those with clinical disorders who tend to be high in dispositional affect intensity and lability, the AIM and ALS tend to be less independent.

Five specific affective dynamics map on to theorized processes underlying affect intensity and lability as measured by the AIM and ALS: mean, intraindividual standard deviation (iSD), adjusted squared successive differences (ASSD), probability of acute change (PAC), and cross-level models of reactivity. These dynamics can be computed based on time-series data captured via ESM. Specifically, mean levels of negative and positive affect (NA_{Mean} and PA_{Mean}) measured over time should approximate stable (or dispositional) mean affect intensity (Watson & Tellegen, 1985). The iSD of negative and positive affect reflects variability of affect across a time-series (NA_{iSD} and PA_{iSD} ; Eid & Diener, 1999; Jahng et al., 2008) and reflects the amplitude of negative and positive affect. Importantly, iSD of negative and positive affect over-time is expected to reflect a stable trait-like process of variability (Eid & Diener, 1999; Watson & Tellegen, 1985). Instability, or moment-to-moment fluctuations in affect can be assessed using two different indices of affective dynamics. First, ASSD assesses fluctuations in affect from one moment to the next and builds upon iSD by considering the temporal dependency of variation in affect (hereafter referred to as NA_{ASSD} and PA_{ASSD} ; Jahng et al., 2008). Furthermore, PAC estimates whether an individual has a higher proportion of large fluctuations compared with the overall amount of ASSD's assessed in the time-series (hereafter referred to as NA_{PAC} and PA_{PAC} ; Jahng et al., 2008). Lastly, cross-level interactions can assess whether the AIM and ALS

are associated with affective reactivity. Specifically, we can examine whether the slope between emotion-eliciting events (e.g., stress) and greater endorsement of negative and positive affect is moderated by level of AIM or ALS.

Goals and Hypotheses

The primary goal of the study was to assess whether dispositional scales of affect intensity and lability, the AIM and the ALS, map on to their corresponding affective dynamics in daily life. In doing so, we examined the extent to which people who, on average, are high on affect intensity and lability also report these patterns of affective responding over a shorter more momentary timescale.

Given that affect intensity is supposed to reflect the magnitude of negative or positive affect experienced, we predicted that the AIM would be associated with higher NA_{Mean} and PA_{Mean} as well as higher NA_{ISD} and PA_{ISD} in daily life. In contrast, we predicted that the ALS would be associated with instability of affect. Specifically, we predicted that the ALS would be associated with frequent moment-to-moment fluctuations in affect (NA_{MSSD} and PA_{MSSD}) and a higher proportion of or large fluctuations in affect (NA_{PAC} and PA_{PAC}). Lastly, we predicted that both the AIM and the ALS would be associated with greater reactivity to stressful, negative, and positive experiences in daily life such that those high on the AIM or the ALS would be more likely to report higher levels of negative and positive affect in response to emotionally-salient experiences in daily life.

Methods

Participants

Monte Carlo simulation is the most appropriate method for determining power and

sample size in multilevel data (Heck & Thomas, 2015). We produced power estimates for 50, 100, 150, and 200 participants with 40 nested observations (time points were estimated based on average compliance rates in our lab; Sperry & Kwapil, 2017). We specified estimates of the fixed and random intercepts based on prior studies of negative and positive affect in daily life with the AIM and ALS. We specified alpha of .05, 500 Monte Carlo replications, and maximized the log-likelihood. Monte Carlo simulations revealed a required sample size of 120 participants for 80% power.

This study was approved by the University of Illinois at Urbana-Champaign Institutional Review Board, and all participants provided informed consent. Participants taking general psychology courses were able to enroll in the study via an online course-credit portal. Usable data was available for 135 of the 147 participants who initially enrolled into the study (59% female, mean age = 19.30, SD=1.20). The final sample self-identified as 45% Caucasian, 31% Asian, 10% African American, and 14% Latino/Hispanic. Participants were dropped due to invalid questionnaires (greater than 2 infrequency items endorsed; $n=4$), completing less than 15 ESM protocols ($n=5$), and for having variance below -1.75 SD on ESM protocols ($n=3$), indicating invalid ESM responding. Participants dropped for low variance had patterns of responding that suggested that they were invalidly and consistently choosing the same number (i.e., all 7's or all 1's) for each item. Participants received course credit for completing the study.

Materials

Participants completed a demographic questionnaire, the AIM and ALS, and an embedded 13-item infrequency scale (Chapman & Chapman, 1983) to detect invalid responders, prior to beginning the weeklong ESM assessments.

Affective Lability Scale. The ALS is a 54-item self-report measure rated on a 4-point Likert scale ranging from “0: Very uncharacteristic of me” to “3: Very characteristic of me.” The ALS is comprised of six conceptual subscales that assess dispositional lability in depression, anger, anxiety, and elation, as well as biphasic shifts between elation and depression, and anxiety and depression. Item examples include, “One minute I can be feeling O.K. and the next minute I’m tense, jittery and nervous”, “I frequently switch from being able to control my temper very well to not being able to control it very well at all”, and “I switch back and forth between being extremely energetic and having so little energy that it’s a huge effort just to get where I’m going.” The total ALS score is calculated as the mean of the six subscale scores. Higher total scores reflect greater trait-like affective lability. The total ALS score, rather than the subscale scores, was used in all analyses because factor analytic studies have failed to reproduce the six conceptual subscales and found that items frequently did not load on their anticipated subscales (Oliver & Simons, 2004), and because no a priori hypotheses were offered regarding specific domains of trait affective lability (e.g., depression versus anger) in daily life.

Affect Intensity Measure. The AIM is a 40-item self-report measure rated on a 6-point Likert scale ranging from “Never” to “Always.” Items tap the extent to which participants typically experience emotions or events intensely, such as “When I feel happy it is a strong type of exuberance” and “When I get angry it’s easy for me to still be rational and not overreact (reverse scored).” The total score for the AIM is calculated as the mean item score across the 40-items. Higher scores reflect greater dispositional affect intensity.

ESM protocol. The ESM protocol included 22 items that assess affect, events and experiences, and thoughts and behaviors in daily life (see Supplemental Table 1). Affect items

were drawn from the affective circumplex (Russell, 1980) and the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) to include high and low arousal negative (nervous, angry, afraid, irritable, sad, bored sluggish) and positive affect (energetic, enthusiastic, relaxed, satisfied, calm, confident). Negative and positive experience items were based on previous research examining affective reactivity (Myin-Germeys et al., 2003; Pishva et al., 2014). All items were answered on a Likert scale ranging from “1: not at all” to “7: very much.” Indices were created for negative affect and positive affect by averaging across affect items. Within- and between-person reliability for indices are presented in Table 1. Items were delivered via the smartphone application Metricwire (Trafford, 2015).

Procedures

Participants attended an information session during which they downloaded the ESM smartphone app, completed self-report questionnaires, and were trained on ESM procedures. Participants completed a practice survey during the information session that was not included in the final data. Following the information session, participants were signaled to complete 8 ESM protocols per day between the hours of noon and midnight for seven and a half days (maximum of 62 protocols) at stratified random intervals (randomized within eight, 90-minute blocks, shortest interval between ESM protocols = 15 minutes). Participants had five minutes to respond to the ESM protocol after which it was no longer available. Responses were time-stamped and automatically uploaded to cloud-based servers. Participants came to the lab once during their week of participation to ensure and encourage adequate responding.

Computation of Affective Dynamics

ESM data have a hierarchical structure in which momentary observations (level 1 data)

are nested within participants (level 2 data). Affective dynamics are computed based on level 1 data and can result in both level 1 or level 2 variables. We define how we calculated each affective dynamic below.

iSD. iSD for negative and positive affect were computed via the formula presented in (1). Note that the calculation of iSD results in two between-person (level 2) variables (NA_{iSD} and PA_{iSD}). To assess whether the AIM and/or ALS were associated with greater variability in affect, two linear regressions were run using the `lm` function (R Core Team, 2019). AIM and ALS scores (Z-scores) were entered as simultaneous predictors of NA_{iSD} and PA_{iSD} , respectively.

ASSD. ASSD's were computed via the formula presented in (2). Following Jahng, Wood, and Trull (2008), lambda (λ) was chosen based on non-parametric smoothing regressions that minimize the sum of squares between adjusted successive differences. We calculated lambda separately for negative and positive affect via the `spline.smooth` function in the `stats` package (R Core Team, 2019). To assess whether the AIM and ALS were associated with individual ASSD's, controlling for NA_{Mean} and PA_{Mean} , we ran two linear mixed-effects models using the package `lme4` (Bates, Mächler, Bolker, & Walker, 2015). We also computed the mean of ASSD's (MSSD) as an indication of between-person differences in instability for descriptive purposes. Note that we did not want to calculate successive differences between the night prior and the next morning, thus the first observation of each day was marked as missing for calculation of successive differences.

PAC. PAC was calculated by first assessing whether adjusted successive differences represent a meaningful increase. Researchers vary in determining what constitutes a "meaningful" increase or decrease in their sample, referred to as the acute cutoff (AC).

Following Jahng et al. (2008) and Trull et al. (2008), we selected AC values of the 90th percentile. All ASD's that were $\geq$ the 90th percentile received an AC value of 1 and ASD's that fell below this threshold received a value of 0. This results in a dichotomous variable with either 1 or 0. At level 2, PAC represents the proportion of AC values of 1 divided by the total number of adjusted successive differences (3). Given that our dependent variable was dichotomous, we ran a series of binomial generalized linear mixed models in lme4 to assess increased odds of having a large fluctuation in affect given scores on the AIM and/or ALS.

$$iSD = \frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2 \quad (1)$$

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

Where Mdn time for all intervals = 5,869 seconds, λ for negative affect = .10, and λ for positive affect = .06.

$$PAC = \frac{1}{N-1} \sum_{i=1}^{N-1} AC_{i+1}, \quad (3)$$

Where $AC_{i+1}=1$, if $ASSD_{i+1} \geq c$ ($c = .99$ for negative affect and 1.24 for positive affect), otherwise $AC_{i+1}=0$.

To examine affective reactivity, cross-level interactions, or slopes-as-outcomes, tested whether level 2 predictors (AIM and ALS) were associated with the slope of the level 1 predictor and criterion controlling for lagged affect. Level 2 variables were grand mean centered and Level 1 predictors (stress and lagged affect) were person-mean centered. Equation 4 displays an example model in which we were tested whether the slope between stress predicted NA_{Mean} at the subsequent time-point (controlling for NA_{Mean} at the prior time-point) was moderated by level of AIM.

$$\begin{aligned}
 NA_{Mean_{ij(t)}} = & \gamma_{00} + \gamma_{01}(AIM)_j + \gamma_{10}(stress)_{ij(t-1)} + \gamma_{20}(NA_{Mean})_{ij(t-1)} + \\
 & \gamma_{11}(AIM)_j(stress)_{ij(t-1)} + U_{0j} + U_{1j}(stress)_{ij(t-1)} + e_{ij}
 \end{aligned} \quad (4)$$

Results

On average, participants completed 63% of possible ESM protocols ($M = 39$, $SD = 10.97$, $Range=15-60$). This resulted in a total of 6,282 level 1 observations; however, for analyses assessing successive differences, total observations dropped to 5,468. Number of completed protocols was uncorrelated with ALS scores ($r=.05$, $p=.56$) or AIM scores ($r=.05$, $p=.58$). Descriptive statistics for all study variables are presented in Table 1 along with zero-order correlations between the AIM, ALS, and each affective dynamic variable. Within- and between-person correlations between affective dynamics are presented in Figure 1. For all correlations we present spearman rank-order rho (ρ) as affective dynamics tend to be non-normally distributed. Reliability for all scales or indices are presented via McDonald's omega (ω ; Zinbarg, Revelle, Yovel, & Li, 2005). For multilevel models, we calculated semi-partial R^2 effect sizes (Edwards, Muller, Wolfinger, Qaqish, & Schabenberger, 2008). Semi-partial R^2 effect sizes for multilevel models can be interpreted following Cohen's (1992) guidelines for semi-partial R^2 (Page-Gould, 2017): small effects $R^2 \geq .02$, medium effects $\geq .13$, and large effects $\geq .26$. For linear regressions, we calculated partial eta squared (η^2) effect sizes.

Associations of AIM and ALS with NA_{Mean} , NA_{iSD} , and NA_{ASSD} are presented in Table 2. As predicted, the AIM was associated with greater variability (larger amplitude) of negative affect (small effect). Contrary to expectation, the ALS, not the AIM, was associated with higher reported momentary negative affect (large effect). Furthermore, the AIM, not the ALS, was associated with large fluctuations in negative affect (small effect) from moment-to-moment.

Full results for the association between AIM and ALS with NA_{PAC} are presented in supplemental Table 2. Briefly, the AIM was associated with NA_{PAC} , Odds Ratio = 1.32, 95% CI [1.06 – 1.64], such that for each 1 SD increase in AIM score, individuals were 1.32 times more likely to have an large change in negative affect. The AIM nor ALS predicted greater affect reactivity (see Table 4).

Associations between AIM and ALS with PA_{Mean} , PA_{iSD} , and PA_{ASSD} are presented in Table 3. Consistent with negative affect, the ALS was associated with higher momentary levels of positive affect (small effect). The AIM was associated with greater moment-to-moment fluctuations (small effect) as well as greater variability (small effect) of positive affect. Full results for the association between AIM and ALS with PA_{PAC} are presented in supplemental Table 3. The AIM was associated with PA_{PAC} , Odds Ratio = 1.32, 95% CI [1.08 – 1.61], such that for each 1 SD increase in AIM score, individuals were 1.32 times more likely to have an large change in positive affect. The AIM nor ALS predicted greater affect reactivity (see Table 5).

Discussion

This was the first study to our knowledge that examined the extent to which the AIM and ALS, dispositional/static scales of affect intensity and affective lability, are associated with their theorized construct in daily life. We assessed five affective dynamics (mean, iSD, ASSD, PAC, reactivity) estimated from ESM time series data. We found that people high in dispositional affect intensity, as measured by the AIM, have more variability and instability of negative and positive affect in daily life whereas affective lability, as measured by the ALS, was associated with mean levels of negative and positive affect. Neither the AIM nor the ALS were associated with reactivity to stressful, negative, or positive experiences in the moment.

Notably, effects were small and the AIM and ALS accounted for little variance in momentary affective dynamics.

People high in dispositional affect intensity have a tendency to experience both negative and positive affect with more strength than others (Larsen & Diener, 1987). Given this conceptualization, we hypothesized that scores on the AIM, the most common static measure of affect intensity, would be associated with higher mean levels of NA and PA in daily life; however, this was not the case. Instead, the AIM was associated with iSD, ASSD, and PAC of negative and positive affect, even after accounting for mean affect. This could be interpreted in two possible ways. If we assume the AIM is measuring its theorized construct, those who are higher in dispositional affect intensity are more likely to display chaotic or unstable patterns of negative and positive affect at the momentary level. In contrast, these findings could indicate that the AIM, as a static measure, may be tapping the *patterns* of affective responding rather than the strength of affect alone. Either way, these results are striking given that Larsen and Diener (1987) explicitly stated that affect intensity, as measured by the AIM, does not reflect the patterns or frequency of intense affect, just the strength of affect experienced. One possibility we considered was that by examining the AIM and ALS as simultaneous predictors of NA_{Mean} and PA_{Mean} the residualized AIM variable may not reflect intensity; however, the zero-order associations between the AIM and NA_{Mean} and PA_{Mean} were non-significant and close to zero.

Dispositional affective lability, commonly measured with the ALS, reflects the tendency to experience intense and frequent shifts in affect in response to internal and external stimuli. As such, we hypothesized that the ALS would be associated with instability and a higher

probability of large fluctuations of affect at the momentary level. Given that the ALS taps lability in terms of both NA (depression, anxiety, anger) and PA (elation), we anticipated that it would be associated with ASSD and PAC of both negative and positive affect. However, the ALS was surprisingly unassociated with instability (ASSD) or large fluctuations (PAC) in affect, but rather was associated with mean levels of negative and positive affect with large effects. At the zero-order level, the ALS was associated with NA_{iSD} , NA_{ASSD} , and NA_{PAC} . But, in multilevel models controlling for mean levels, these associations disappeared. This suggests two things. First, it could be that scores on the ALS are conflated with mean levels of negative and positive affect. Second, those who retrospectively report that they have large mood swings in general may not actually experience mood swings from moment-to-moment. Taken together, these results highlight that affective lability, as measured by a static/dispositional scale, should not be used as a proxy for affective lability on shorter timescales (e.g., moment-to-moment).

Results from the current study highlight three theoretical and methodological questions important for affective science. First, *is how people retrospectively report on their emotions on average different than how they report on their emotion in the moment?* The present findings suggest, *yes* – dispositional scales of affect intensity and lability reflect something different than their corresponding affect dynamics at a momentary level. In general, the associations between the AIM/ALS and affect dynamics were small and the two measures simultaneously accounted for a small amount of variance in most models. Specifically, the AIM and ALS accounted for only 17% of the variance in NA_{iSD} and 12% of the variance in NA_{ASSD} . Dispositional scales accounted for the most variance (48%/41%) in mean levels of negative and positive affect in daily life. These findings are consistent with previous research showing that trait-based measures of the

experience of emotion were poorly representative of the experience of emotion in daily life (Koval et al., 2015; Schimmack, 2003). Some theories suggest that asking people about the dynamics of their affect retrospectively may capture *beliefs* about one's emotions rather than the actual patterns and variations of affect experienced in the moment (Izard et al., 1993; Russell, 2003). Taken together, dispositional scales assessing dynamic phenomenon may tap something different than their theorized construct when measured at the momentary level.

Second, *how is affect intensity unique from affective lability both at a static and dynamic level?* Studies have consistently reported that the AIM and ALS are distinct constructs and that on average, *intensity* is independent from *lability* (Harvey et al., 1989). In the present study, the AIM and ALS were moderately correlated, and this correlation was slightly higher than those reported in non-clinical undergraduate samples (e.g., Oliver & Simons, 2004). However, the AIM and ALS had clear differences in terms of what they predicted at the momentary level both in terms of zero-order correlations and multilevel regressions. In comparing affective dynamics at the momentary level, an interesting pattern emerged. At the between-person level, NA_{Mean} was correlated with NA_{iSD} and NA_{ASSD} with large effects; however, at the within-person level, NA_{Mean} was correlated with NA_{iSD} and NA_{ASSD} with small to negligible effects. These results suggest a clear pattern in which, on average, people who have higher mean negative affect are more likely to have more variable negative affect even though there are significant differences within these patterns as evidenced by significant random intercepts in both models. However, there is less stability of this association when considering how an individual's patterns of negative affect differs from their own average across the sampling period. Furthermore, PA_{Mean} was uncorrelated with PA dynamics at either the between- and within-person level indicating that

there is a less clear association between mean levels of positive affect and variability of positive affect over time.

Third, *do more complex affective dynamics such as ASSD and PAC provide additional information that mean or iSD do not capture?* This is an important and timely question in the context of current debates in affective science. Two recent studies have called into question the added value of complex affective dynamics suggesting that mean and iSD indices may account for the most variance in affective experiences in daily life (Dejonckheere et al., 2019; Wendt et al., 2019). The present findings contribute to this growing literature and suggests that more complex affective dynamics such as ASSD and PAC may provide redundant information, at least in non-clinical undergraduate samples. All associations between the AIM and ALS were largely the same with iSD, ASSD, and PAC. More notably, both between- and within-person correlations between iSD, ASSD, and PAC were large and indicated substantial overlap (between-person ρ : .80 – .95; within-person ρ : .72 - .73). However, we want to be clear that future research is warranted as the overlap or distinctness of complex affective dynamics may be unique to specific populations (e.g., borderline personality disorder, bipolar spectrum disorders; Trull et al., 2008; Sperry, Walsh & Kwapil, 2020; Sperry & Kwapil, 2020).

Limitations & Future Directions

There were several limitations of the study that should be considered in future investigations. First, this study examined affective dynamics over a relatively short time period, 7 days. Ostensibly, some participants may have had a 7-day period that was not consistent with how they experience emotions on average. Alternatively, it could be that affective dynamics more closely resemble dispositional measure if assessed over longer periods of time. However,

Mroczek, Spiro, and Almeida (2003) found that regardless of sampling period (7-days versus a decade-long period), people tend to vary both from themselves and one another so we are unsure whether this would make a large difference in findings. Second, the AIM or ALS were associated with affective reactivity at the momentary level. However, reactivity was assessed across all observations rather than within contexts in which a person specifically endorsed an emotion-eliciting internal or external event. Many studies of reactivity suggest first asking participants, did you experience a positive or negative event (yes/no) and if so, how intense was it. Future research should examine more accurate estimates of reactivity to determine whether the ALS or AIM is associated with momentary reactivity. Lastly, compliance of participants was relatively low (66%) for ESM studies; however, this percentage was consistent with previous studies conducted with non-paid course credit students participating in research (Kwapil et al., 2011; Walsh et al., 2012; Sperry & Kwapil, 2017).

Conclusions

As Kuppens (2015) noted, the field of emotions research needs an “explicit recognition that a thorough understanding of the nature, causes, and consequences of emotions entails explicitly taking into account their dynamical nature” (p. 298). The present study calls into question whether people report on their emotions differently when reporting patterns *on average* versus in the moment and suggests that static measures of dynamic phenomenon, such as the AIM and ALS, may be limited in the extent to which they capture affective dysregulation in the moment.

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Table 1*Descriptive Statistics for Final Sample (n = 135)*

<i>Variables</i>	Mean	SD	Min	Max	ω_{within}	ω_{between}	AIM	ALS
AIM	3.68	.50	2.28	4.80	--	.94	--	--
ALS	1.36	.46	.42	2.40	--	.90	.32*	--
NA _{Mean}	2.25	.74	1.04	4.84	.68	.91	.13	.52*
PA _{Mean}	3.71	.80	1.59	6.45	.73	.92	-.09	-.26*
NA _{iSD}	.72	.26	.12	1.62	--	--	.32*	.37*
PA _{iSD}	.92	.27	.27	1.63	--	--	.26*	.06
NA _{MSSD}	.81	.64	.00	3.86	--	--	.26*	.25*
PA _{MSSD}	1.33	.85	.14	5.20	--	--	.26*	.08
NA _{PAC}	.11	.11	.00	.43	--	--	.30*	.28*
PA _{PAC}	.12	.10	.00	.50	--	--	.27*	.01

Note. AIM = Affect Intensity Measure, ALS = Affective Lability Scale, NA = negative affect, PA =

positive affect, Mean = Average across 14 days, iSD = intraindividual standard deviation, MSSD

= mean square of successive differences, PAC = probability of acute change. ω = McDonald's

omega internal consistency. * $p < .05$

Table 2*Associations Between the AIM and ALS with NA Mean, iSD, and ASSD*

<i>Predictors</i>	NA_{Mean}				NA_{iSD}				NA_{ASSD}			
	<i>Estimates^a</i>	<i>CI</i>	<i>p</i>	<i>R_β²</i>	<i>Estimates^b</i>	<i>CI</i>	<i>p</i>	<i>η²</i>	<i>Estimates^a</i>	<i>CI</i>	<i>p</i>	<i>R_β²</i>
(Intercept)	2.25	2.14 – 2.36	<.001	--	.30	.17 – .43	<.001	--	.03	-.14 – .20	.71	--
AIM	-.02	-.14 – .09	.68	.00	.06	.03 – .10	<.01	.08	.14	.03 – .25	.01	.05
ALS	.40	.28 – .51	<.001	.35	.00	-.04 – .05	.86	.00	-.02	-.12 – .09	.79	.00
NA _{Mean}	--	--	--	--	.18	.13 – .24	<.001	.25	.35	.28 – .41	<.001	.00
Observations	6282				135				3825			
<i>R²(m) / R²(c)</i>	.13 / .48				.38 / .37				.06 / .15			

Note. ^a Multilevel regression coefficient, ^b Standardized regression coefficient, ^c Odds Ratio from binomial (link = logit) generalized

linear mixed effect models. $R^2(m)$ = marginal R^2 . $R^2(c)$ = Conditional R^2 . R_{β}^2 can be interpreted as a semi-partial R^2 with small

effects $\geq .02$, medium effects $\geq .13$, and large effects $\geq .26$. η^2 = partial eta squared effect size. Significant p values $< .05$ are bolded.

Table 3*Associations Between the AIM and ALS with Positive Affect Mean, iSD, and ASSD*

<i>Predictors</i>	PA_{Mean}				PA_{iSD}				PA_{ASSD}			
	<i>Estimates^a</i>	<i>CI</i>	<i>p</i>	<i>R_β²</i>	<i>Estimates^b</i>	<i>CI</i>	<i>p</i>	<i>η²</i>	<i>Estimates^a</i>	<i>CI</i>	<i>p</i>	<i>R_β²</i>
(Intercept)	3.71	3.58 – 3.85	<.001	--	.87	.65 – 1.09	<.001	--	1.44	1.17 – 1.71	<.001	--
AIM	-.00	-.14 – .14	.96	.00	.07	.03 – .12	<.01	.07	.22	.07 – .37	.01	.06
ALS	-.21	-.35 – -.07	<.01	.00	-.00	-.05 – .04	.85	.00	-.01	-.16 – .14	.85	.00
PA _{Mean}	--	--	--	--	.02	-.04 – .07	.60	.00	-.03	-.09 – .03	.30	.00
Observations	6284				135				5468			
<i>R²(m) / R²(c)</i>	.03 / .41				.07 / .05				.01 / .10			

Note. ^a Multilevel regression coefficient, ^b Standardized regression coefficient, ^c Odds Ratio from binomial (link = logit) generalized

linear mixed effect models. $R^2(m)$ = marginal R^2 . $R^2(c)$ = Conditional R^2 . R_{β}^2 can be interpreted as a semi-partial R^2 with small

effects $\geq .02$, medium effects $\geq .13$, and large effects $\geq .26$. Significant p values $< .05$ are bolded.

Table 4*AIM and ALS with Negative Affect Reactivity in Daily Life*

NA_t					NA_t				
<i>Predictors</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>	<i>R_β²</i>	<i>Predictors</i>	<i>Estimates</i>	<i>CI</i>	<i>p</i>	<i>R_β²</i>
(Intercept)	1.60	1.49 – 1.70	<.001	--	(Intercept)	1.66	1.55 – 1.76	<.001	--
Stress _{t-1}	.03	.01 – .04	<.01	.06	NegExp _{t-1}	.21	.19 – .23	<.001	4.10

NA _{t-1}	.29	.26 – .32	<.001	.08	NA _{t-1}	.26	.24 – .29	<.001	.09
AIM	.07	-.02 – .16	.11	.02	AIM	.08	-.02 – .17	.11	.02
Stress _{t-1} * AIM	.00	-.01 – .02	.69	.00	NegExp _{t-1} * AIM	.02	.00 – .04	.05	.03
Observations	5466					5466			
$R^2(m) / R^2(c)$	.13 / .43					.22 / .55			
(Intercept)	1.59	1.50 – 1.69	<.001	--	(Intercept)	1.66	1.56 – 1.75	<.001	--
Stress _{t-1}	.03	.01 – .04	<.01	.06	NegExp _{t-1}	.21	.19 – .23	<.001	3.89
NA _{t-1}	.29	.26 – .32	<.001	.08	NA _{t-1}	.26	.24 – .29	<.001	1.00
ALS	.28	.20 – .36	<.001	.39	ALS	.29	.21 – .37	<.001	.38
Stress _{t-1} * ALS	.02	-.00 – .03	.06	.03	NegExp _{t-1} * ALS	.01	-.01 – .03	.35	.01
Observations	5466					5466			
$R^2(m) / R^2(c)$	.25 / .46					.34 / .57			

Note. $R^2(m)$ = marginal R^2 . $R^2(c)$ = Conditional R^2 . $R^2_{\beta^2}$ can be interpreted as a semi-partial R^2 with small effects $\geq .02$, medium

effects $\geq .13$, and large effects $\geq .26$. Significant p values $< .05$ are bolded.

Table 5*AIM and ALS with Positive Affect Reactivity in Daily Life*

<i>Predictors</i>	<i>Estimates</i>	PA_t <i>CI</i>	<i>p</i>	R_β ²
(Intercept)	2.62	2.48 – 2.77	<.001	--
PosExp _{t-1}	.01	-.01 – .03	.18	.01
PA _{t-1}	.29	.26 – .32	<.001	.08
AIM	-.05	-.15 – .05	.31	.01
PosExp _{t-1} *AIM	-.00	-.02 – .02	.90	.01
Observations	5468			
<i>R²(m) / R²(c)</i>	.11 / .36			
(Intercept)	2.62	2.48 – 2.77	<.001	--
PosExp _{t-1}	.01	-.01 – .03	.17	.01
PA _{t-1}	.29	.26 – .32	<.001	.08
ALS	-.14	-.23 – -.04	.01	.07
PosExp _{t-1} *ALS	-.00	-.02 – .02	.90	.00
Observations	5468			
<i>R²(m) / R²(c)</i>	.13 / .36			

Note. $R^2(m)$ = marginal R^2 . $R^2(c)$ = Conditional R^2 . R_{β}^2 can be interpreted as a semi-partial R^2

with small effects $\geq .02$, medium effects $\geq .13$, and large effects $\geq .26$. Significant p values $< .05$

are bolded.

Figure 1

Note. Spearman rank-order rho correlation coefficients are displayed. Colored circles correspond to the strength of the correlation.

Only significant correlations ($p < .05$) have shading. Between-person rho is presented on the left and within-person rho is presented on the right. Associations with iSD are only presented at the between-person level as this is a Level 2 variable.