Riding the Tide of Emotions With Mindfulness: Mindfulness, Affect Dynamics, and the Mediating Role of Coping

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Little research has examined ways in which mindfulness is associated with affect dynamics, referring to patterns of affect fluctuations in daily life. Using ecological momentary assessment (EMA), the present study examined the associations between trait mindfulness and several types of affect dynamics, namely affect variability, affect inertia, affect switch, and affect instability. Three hundred ninety undergraduate students from Singapore reported their current emotions and coping styles up to 19 times per day across 2 days. Results showed that trait mindfulness correlated negatively with variability, instability, and inertia of negative affect and positively with negative-to-positive affect switch. These relationships were independent of openness, habitual reappraisal, habitual suppression, depression, and self-esteem. Importantly, lower maladaptive coping was found to mediate these relationships. The study suggests that trait mindfulness independently promotes adaptive patterns of affective experiences in daily life by inhibiting maladaptive coping styles.

Keywords: affect dynamics, affect inertia, affect variability, coping, mindfulness

Mindfulness has been theoretically and empirically associated with psychological well-being. One commonly cited definitions of mindfulness is the awareness that arises through “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994, p. 4). Key elements of mindfulness, namely awareness and an attitude of nonjudgmental acceptance toward one’s moment-to-moment experience, are regarded as potentially effective antidotes against common forms of psychological distress, many of which involve the maladaptive tendencies to avoid, suppress, or overengage distressing thoughts and emotions (Hayes & Feldman, 2004). Research has demonstrated positive associations between mindfulness and affective well-being. In particular, trait mindfulness predicts lower levels of day-to-day negative affect (Brown & Ryan, 2003; Weinstein, Brown, & Ryan, 2009), higher levels of well-being (Weinstein et al., 2009), and more effective emotion regulation abilities (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Psychological interventions that incorporate mindfulness have been found to be effective in improving emotion regulation and well-being in both clinical and nonclinical populations (Keng, Smoski, & Robins, 2011; Robins, Keng, Ekblad, & Brantley, 2012).

However, research on the association between mindfulness and affective well-being has largely focused on average levels of affect. Real life affective experiences involve more complex processes. For example, an individual’s affect within a day may vary in considerable intensity and valence. There is emerging evidence and increasing recognition that these dimensions of affect dynamics are predictive of psychological health (Koval, Pe, Meers, & Kuppens, 2013; Kuppens, Allen, & Sheeber, 2010), which means that failure to account for them because of an exclusive focus on affect averages risks losing a more nuanced and complete understanding of the affective processes associated with mindfulness. To date, few studies have examined ways in which trait mindfulness is associated with affect dynamics. Using an ecological momentary assessment (EMA) approach, the present study aims to investigate the association between mindfulness and several aspects of affect dynamics, namely affect variability, affect instability, affect inertia, and affect switch, in a multiethnic Asian student population. Further, we tested these associations while controlling for several dispositional constructs related to mindfulness and affect dynamics. Finally, little is known regarding the mechanisms accounting for the relationship between mindfulness affective dynamics. To this end, we examined whether adaptive versus maladaptive coping styles mediate the association between mindfulness and the different aspects of affect dynamics.

Affect Dynamics and Its Association With Mindfulness

Affect dynamics refer to patterns of fluctuations of emotions in daily life (Koval et al., 2013). As there are marked differences in the trajectories and patterns of emotions across individuals, it is important that research captures the temporal dynamics of affective experiences, beyond simply average or baseline levels of affect. Research to date has characterized several aspects of affect dynamics, including affect variability, affect inertia, affect instability, and affect switch, all of which have important implications...
examined the affective dynamics of global positive and negative
ceived stress. In the present study, we examined the extent to
various factors, such as environmental stressors or levels of per-
dynamics may inform the development of interventions to promote
psychological well-being. Affect dynamics may be a function of
various factors, such as environmental stressors or levels of per-
ceived stress. In the present study, we examined the extent to
which trait mindfulness is predictive of affect variability, instabil-
ity, inertia, and switch. Our conceptualization of affect is based on
the evaluative space model, which postulates that emotions can be
differentiated along generalized positive and negative dimensions
that can be activated reciprocally, uncoupled, or nonreciprocally
(Cacioppo, Bernston, Norris, & Gollan, 2011). Therefore, we
examined the affective dynamics of global positive and negative
affect and their distinct relationships with trait mindfulness.

Affect Variability

Affect variability refers to within-person variation or standard
deviation of affect over time (e.g., Eid & Diener, 1999). Affect
variability captures the range of levels within which affect varies
over a certain period, and may be unrelated to average affect
during the same period; a person whose negative affect levels
range widely might, on average, experience the same level of
negative affect as another whose negative affect levels range more
narrowly. Affect variability has clear implications for psychologi-
cal well-being. For example, studies have found that affect vari-
ability is positively associated with depressive symptoms (Peeters
et al., 2006; Wichers et al., 2010), low self-esteem (Kuppens, Van
Mechelen, Nezlek, Dossche, & Timmermans, 2007), and symp-
toms of bipolar disorder (Knowles et al., 2007).

Research has shown that mindfulness may be negatively asso-
ciated with affect variability. Given that mindfulness entails the
ability to be nonjudgmental and nonreactive toward one’s experi-
ences (Baer et al., 2006), individuals who are mindful may be less
emotionally reactive and, as a result, experience lower affect
variability. Research has found that trait mindfulness predicts
lower negative affect variability among undergraduates (Hill &
Updegraff, 2012) and African Americans (Adams et al., 2014).

Affect Instability

Affect instability reflects how rapidly affect fluctuates between
successive time-points (Jahng, Wood, & Trull, 2008). It is opera-
tionalized by mean square successive difference (MSSD), which is
the average of the squared difference between scores recorded at
consecutive observations (Jahng et al., 2008, Equation 3). Affect
instability is independent of affect average: two individuals who
exhibit different rates of moment-to-moment fluctuation in affect
cross a time period may experience the same level of affect on
average over that period. It differs also from affect variability;
affect can fluctuate rapidly or slowly for any given range (Ebben-
Priemer, Eid, Kleindienst, Stabenow, & Trull, 2009; Jahng et al.,
2008). Importantly, high affective instability is indicative of
greater emotional reactivity across situations, which prior research
has shown to predict poorer psychological health (Costa & Mc-
Crane, 1980; DeNeve & Cooper, 1998). Indeed, there is evidence
that affective instability, regardless of valence, is positively asso-
ciated with depression (Neumann, van Lier, Frijns, Meeus, &
Koot, 2011; Thompson, Berenbaum, & Bredemeier, 2011) and
symptoms of borderline personality disorder (Ebnner-Priemer et al.,
2007; Stein, 1996; Woys猾ville, Lackamp, Eisengart, & Gilliland,
1999).

To date, no research has examined the association between trait
mindfulness and affective instability using an EMA approach.
Some findings suggest that mindfulness may be associated with
less affective reactivity. In one study, practitioners of mindfulness
meditation demonstrated lower emotional interference in response
to affective pictures when performing a tone-categorization task
compared with nonpractitioners (Ortner, Kilner, & Zelazo, 2007).
In another study, participants who received a course in mindful-
ness meditation also showed lower emotional interference when
completing a tone-categorization task, compared with those with-
out this intervention (Ortner et al., 2007). However, it is unclear
whether emotional interference in a reaction time (RT) task is a
good measure of affect instability, much less whether these labo-
atory findings are generalizable to mindfulness–affect instability
relationships in everyday life.

Affect Inertia

Affect inertia refers to the extent to which affect persists from
one time point to the next. It is operationalized by the degree to
which current affect predicts the same affect later in time (Suls,
Green, & Hills, 1998), and can be conceptualized at various
temporal intervals (e.g., minutes, days). It is notable that current
approaches in operationalizing affect inertia take into consider-
ation shifts in affect of one valence from one time point to a
subsequent time point, but do not account for the presence of
opposite valence affect at the initial time point. In the present
study, we proposed and utilized an approach for assessing affect
inertia that takes into account the presence of opposite-valence
affect at the initial time point, which we believe is a more accurate
representation of affect inertia.

Affect inertia is independent of average affect (Koval & Kup-
pens, 2012). It is distinct from affect variability; regardless of the
extremity of one’s affect levels, one can recover quickly from an
emotional experience, or continue to linger in it. It is also not
necessarily inversely related to affect instability (Koval et al.,
2013; for example, an affect can persist over time (e.g., high
negative affect inertia), while fluctuating frequently within this
period of inertia (i.e., high instability). The ability to experience
appropriate emotional recovery in the context of relevant events
can have adaptive value in mobilizing individuals to respond to
these events appropriately. High levels of affect inertia may there-
fore be indicative of psychological maladjustment. Indeed, re-
search has shown that negative affect inertia is positively associ-
ated with depression (Koval, Kuppens, Allen, & Sheeber, 2012;
Kuppens et al., 2010) and symptoms of borderline personality
disorder (Tolpin, Gunthert, Cohen, & O’Neill, 2004). Research has
also shown that affect inertia predicts psychological functioning
independently of affect variability (Kuppens et al., 2010).

The potential association between mindfulness and everyday
affect inertia remains unexplored. On the one hand, individuals
who are more mindful may sense and engage with their emotions
more deeply, which may lead to greater resistance to affect change.
On the other hand, being mindful may also enable individuals to disengage from their emotions more effectively, leading to lower affect inertia. A study found that mindfulness meditation practitioners were slower than nonpractitioners in generating opposite-valence memories immediately after a mood induction (by filmclips), but later caught up with the nonpractitioners (about 2.4 min later) by generating as many of such memories (Greenberg & Meiran, 2014). These findings suggest that trait mindfulness predicts higher affect inertia immediately after an emotion-eliciting event, but a quick recovery from the emotion later.

**Affect Switch**

_Affect switch refers to the ease with which negative (or positive) affect changes to positive (negative) affect._ It is operationalized by the degree to which current affect predicts the opposite-valence affect later in time and can also be conceptualized at various temporal widths. Similar to affect inertia, current approaches to assessing affect switch take into consideration changes in one affect to an opposite-valence affect from a time point to a subsequent time point, but do not account for the presence of opposite-valence affect at the initial time point. In the present study, we implemented an alternative approach to assessing affect switch that takes into account the degree of opposite-valence affect at Time 1.

One example of affect switch is affective diurnal variation, in which a person who feels negative in the morning feels increasingly positive as the day progresses (e.g., Clark, Watson, & Leeka, 1989; Daly et al., 2011; Watts, Cox, & Robson, 1983). Affect switch is not a direct opposite of affect inertia. For instance, a person who no longer feels negative after an upsetting experience (i.e., low negative affect inertia) may not necessarily feel positive as a result (i.e., no negative-to-positive affect switch). Importantly, affect switch has been linked to affect-related disorders. For instance, distressed individuals with below average cortisol levels were found to experience stronger affective diurnal variation (i.e., switching from feeling negatively to positively within a day) (Daly et al., 2011) and individuals with borderline personality disorder were found more likely than healthy controls to experience a switch from positive to negative affect over 24 hours (Ebner-Priemer et al., 2007). However, to our knowledge, affect switch has not been studied in relation to mindfulness.

In summary, a primary aim of this study was to examine the association between trait mindfulness and affect variability, instability, inertia, and switch. In addition, we also examined whether these trait mindfulness—affect dynamics relationships are independent of dispositional variables that both trait mindfulness and affect dynamics are known to be associated with. Previous research has found that trait mindfulness is positively associated with openness (Baer et al., 2006; Brown & Ryan, 2003), self-esteem (Brown & Ryan, 2003), and habitual tendency to engage in reappraisal as a coping strategy (Garland, Gaylai, & Park, 2009), as well as negatively associated with depression (Baer et al., 2006) and the chronic tendency to engage in suppression (Baer et al., 2006; Tamagawa et al., 2013). Depression and self-esteem have also been associated with particular aspects of affect dynamics, such as affect variability (Koval et al., 2012; Kuppens et al., 2010; Neumann et al., 2011; Peeters et al., 2006; Thompson et al., 2011; Wichers et al., 2010). As these variables may account for the relationship between mindfulness and affect dynamics, it is important to examine whether trait mindfulness would be uniquely associated with the different aspects of affect dynamics, above and beyond these variables.

**Coping as Mediator of Mindfulness—Affect Dynamics Relationships**

Theoretical work has proposed that mindfulness may enhance well-being through promoting the use of adaptive coping styles (e.g., active coping and reappraisal) and lowering the use of maladaptive coping styles (e.g., self-blaming, distraction, and venting of emotions). Garland et al. (2009) suggest that being mindful enables individuals to decenter from distressing thoughts and emotions, which facilitates broadening of attention and the ability to generate positive appraisals in response to stressful situations. Broadening of attention may in turn enable individuals to take proactive steps toward resolving a stressful situation. Mindfulness may also mitigate the tendency to catastrophize negative situations, which reduces reactivity toward these situations (Garland, 2007). Consistent with this view, Hamilton, Kitzman, and Guyotte (2006) propose that mindfulness practice can help strengthen metacognitive skills and enable individuals to generate realistic appraisals of stressors and discontinue habitual, maladaptive ways of coping.

For example, individuals who are mindful may be less inclined to engage in avoidant coping, which involves turning attention away from stressful situations by ignoring or escaping from these situations.

Several studies have explored the association between trait mindfulness and various coping styles. Weinstein, Brown and Ryan (2009) found that trait mindfulness predicted lower use of avoidant coping in response to a stressful laboratory task. Trait mindfulness was also found to predict higher levels of approach coping and lower levels of avoidant coping prospectively, over a 1-month period (Weinstein et al., 2009). Trait mindfulness was found to be positively associated with problem-solving coping and negatively associated with avoidant coping (Palmer & Rodger, 2009). Also, mindfulness training was negatively associated with reductions in impulsive, reactive coping styles (defined by strong emotional responses, distortion of facts, and impulsivity) among women with heart disease (Tacon, McComb, Caldera, & Randolph, 2003). It has also been associated with increases in positive coping strategies and decreases in negative coping strategies among working adults (Walach et al., 2007).

Taken together, these studies suggest that mindfulness is associated with greater use of adaptive coping styles and lower use of maladaptive coping styles. However, it is not known whether coping styles may account for the relationships between mindfulness and affect dynamics. More generally, there remains very little research on the mechanisms behind affect dynamics. Researchers have posited that regulatory processes should play pivotal roles in affect dynamics (e.g., Kuppens et al., 2010). Consistently, we proposed that coping styles are likely candidates that could explain individual differences in affect dynamics.

**The Current Study: Goals and Predictions**

We have two goals in this study. The first is to examine the relationships between trait mindfulness and the temporal dynamics
of both negative and positive affect. As noted, individuals who are more mindful may be less reactive toward negative external and internal stimuli and more able to disengage from their affective impact. Hence, we predicted that high trait mindfulness would be related to lower negative affect variability, instability, and inertia, and a greater likelihood to experience a switch from negative to positive affect (i.e., higher negative-to-positive affect switch). Also, we also predicted that individuals who are mindful are less likely to experience a switch from positive to negative affect.

Predictions for positive affect were more difficult to make. If mindful individuals are characterized by greater equanimity and lower susceptibility to emotional influences, they may display lower variability and instability in positive affect, and higher positive affect inertia. Being effective at regulating emotions however also suggests that they may have the capacity to vary the intensity and frequency of their positive experiences, depending on their goals and situational factors, which may result in higher affective variability and instability. Given the lack of relevant prior research, we examined the relationships between mindfulness and the dynamics of positive affect in an exploratory fashion. Also, we examined whether any significant relationships between trait mindfulness and affect dynamics would remain robust when the effects of openness, habitual reappraisal, habitual suppression, depression, and self-esteem are controlled for.

The second goal of the study was to examine adaptive and maladaptive coping as potential mediators of the relationship between mindfulness and negative affect dynamics. Specifically, because increased use of adaptive coping (or conversely, decreased use of maladaptive coping) may enable individuals to moderate their reactivity to negative experiences and disengage from them, we predicted that greater use of adaptive coping and/or lower use of maladaptive coping would mediate the hypothesized relationships between mindfulness and dynamics of negative affect.

To examine these objectives, we employed EMA that involved intensive recording of participants’ daily emotions and coping responses. A large sample of 390 participants were signaled 36 times over 2 days, and were asked to rate their current emotions and coping responses to their recent situation. Trait mindfulness was measured approximately a week before the EMA segment. The current design provides an online assessment of affect and coping instead of relying on recall, gives higher statistical power because of the large number of data-points, and reveals naturalistic emotion and coping processes instead of laboratory-based effects.

**Method**

**Participants**

Participants were 395 undergraduates (61% female) from the National University of Singapore. Mean age was 22.08 years ($SD = 1.36$). Five participants did not attend the questionnaire session. Hence, usable sample size was 390. Consistent with the ethnicity composition in Singapore, this sample of 390 participants was predominantly Chinese (84.9%), followed by Indians (5.1%), Malays (3.6%), and other ethnic groups (6.4%).

**Procedure and Materials**

Participants were recruited by advertisements posted on campus for a study entitled ‘Daily Experiences.’ They first completed a battery of questionnaires, which included measures of dispositional mindfulness, openness, habitual reappraisal, habitual suppression, depression, and self-esteem, and a demographic form. Approximately a week later, they participated in the EMA portion of the study, which lasted for two days. All participants attended a briefing session in the morning of the first day, during which they were informed that they would be loaned and expected to carry a handheld palm computer for the following two days. They were told that the palm computer would signal at random times between 9am and 6 p.m. the first day and between 9am and 5 p.m. the second day. The participants were told that once the computer signaled, they were to answer the questions presented on the screen, which comprised items related to emotions and coping. They were also told that if they were busy when the computer beeped, they could respond up to 10 min later, or simply skip that observation. The study was conducted during the regular semester, in the midst of the student participants’ daily pursuits. Each participant could contribute up to 36 observations. Participants were paid S$1 for completing items in each observation.

The palm pilot was set to signal at about half-hour intervals, but sufficiently varied in time so that each signal appeared random to the participants. In each observation, participants were told to focus on the event that engaged their attention the most between that time point and up to 15 min before the time point. They then rated their emotions during this event and how they coped with it. Because coping are focused reactions to specific events, it was necessary to instruct the participants to focus on a referent event, instead of having them rate their coping styles abstractly. The time frame of 15 min made it likely that a referent event would be captured. Because participants were asked to respond amid their daily pursuits, the questionnaire had to be brief and single items were used. Although measurement error is a potential issue, single items are standard practice in event-sampling studies and the items were taken or adapted from past studies (see below).

**Measures**

**Trait mindfulness.** Trait mindfulness was measured using the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). The scale consists of 15 items rated on a 7-point Likert-type scale. Participants were instructed to rate how frequently or infrequently they had encountered the experience stated in each item (example items: “I break or spill things because of carelessness, not paying attention, or thinking of something else” and “I find myself doing things without paying attention”). Because all items were worded to reflect mindlessness, they were reversed scored and averaged to form an index of trait mindfulness ($\alpha = .89$). This scale conceptualizes mindfulness as a single factor construct characterized by present-moment attentional focus, which, according to the developers of the scale, is foundational to the definition of mindfulness, relative to other attitudinal processes, such as acceptance (Brown & Ryan, 2003; Kabat-Zinn, 1994). This is in contrast to other scales that assess mindfulness as a multidimensional construct (e.g., Five Facet Mindfulness Questionnaire [FFMQ];

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The study ended on 5 p.m. on the second day and not 6 p.m. so that an hour could be used for debriefing and also to keep the research assistants’ duties to within regular working hours.
Baer et al., 2006) consisting of both attentional and attitudinal dimensions.

**Openness.** Openness was measured using International Personality Item Pool (IPIP) scale. Participants rated how much each statement (e.g., “Have a vivid imagination”) applied to them on seven-point scales that ranged from 1 (very inaccurately) to 7 (very accurately). Oppositely worded items were reverse-scored, and all items were then averaged \((\alpha = .80)\).

**Habitual reappraisal and suppression.** Participants completed both the reappraisal (e.g., “When I want to feel less negative emotion, I change the way I’m thinking about the situation”) and suppression (e.g., “I keep my emotions to myself”) subscales of the Emotion Regulation Questionnaire (Gross & John, 2003) on 7-point scales that ranged from 1 (not at all true) to 7 (very true). Respective items were averaged to give reappraisal \((\alpha = .81)\) and suppression scores \((\alpha = .73)\).

**Depression severity.** Participants completed the Center for Epidemiologic Studies Depression Scale (Radloff, 1977; e.g., “I thought that my life until now had been a failure”) on 7-point scales that ranged from 1 (hardly) to 7 (most of the time). Opposite items were reverse-scored and all items were averaged \((\alpha = .91)\).

**Self-esteem.** Participants completed Rosenberg’s (1965) Trait Self-Esteem scale on 7-point scales that ranged from 1 (not at all true) to 7 (very true) (e.g., “I certainly feel useless at times”). Opposite items were reverse-scored and all items were averaged \((\alpha = .90)\).

**Positive and negative affect.** Participants rated how they felt during the referent event. Each item began with I felt/feel, followed by amusement, anger, contentment, disgust, fear, frustration, guilt, hope, gratitude, joy, love, pride, sadness, serenity, and shame in randomized order. These items represent a variety of emotional states. All items were rated on seven-point scales that ranged from 1 (not at all) to 7 (extremely). The items were averaged within observation and valence, giving negative affect mean and positive affect mean, to reflect the level of each category of affect reported in each observation. To assess internal reliability, scores for each emotion item were averaged across observations within each participant and Cronbach’s alphas were computed over these grand averaged scores. High internal reliabilities were found for both negative affect mean \((\alpha = .96)\) and positive affect mean \((\alpha = .92)\).

**Coping styles.** Participants rated coping items commonly used in past studies (e.g., Gunthert, Cohen, & Armeli, 1999; Stone & Neale, 1984): ‘Did you think about ways to handle this event, gather information about it, and/or actually do something to handle it?’ (active coping); ‘Did you try to see this event in a different light that made it seem more positive/less negative?’ (reappraisal); ‘Did you divert your attention away from the event by thinking about other things or engage in other things?’ (distraction); ‘Did you fantasize about what you wished could have happened?’ (fantasizing); ‘Did you blame yourself?’ (self-blame); and ‘Did you vent your emotions?’ (venting). All coping items were rated on 7-point scales that ranged from 1 (not at all true) to 7 (extremely). Also, for a separate purpose to examine perceived relevance of coping styles, each coping item included the option not applicable (NA). Participants either rated the seven-point scales or ticked NA to indicate that the coping style was not relevant for the event. If participants indicated NA, they would proceed to the next item. A principle component analysis conducted on the within-participant averaged coping scores suggests a two-factor solution that accounted for 48.46% and 16.18% of the variance respectively, with each item generally loading more highly onto one factor \((> .63)\) than the other factor \((< .52)\) (NA responses were treated as missing). Distraction, fantasizing, self-blame, and venting were grouped into the first factor and active coping and reappraisal were grouped into the second factor. Given the conceptual and empirical overlap among these items, active coping and reappraisal were averaged to give a composite score of adaptive coping \((\alpha = .73)\) and distraction, fantasizing, self-blame, and venting were averaged to give a composite score of maladaptive coping \((\alpha = .71)\). The same internal reliability analyses applied on affect found high internal reliabilities for both adaptive coping \((\alpha = .73)\), and maladaptive coping \((\alpha = .91)\).

**Results**

**Preliminary Analyses: NA Responses**

Although the NA data is not of interest in this study, we explored the proportion of NR responses before conducting further analyses. Participants provided 11,136 responses out of a total 14040 (390 participants × 36 observations). The 20.68% nonresponse rate was likely due to participants not being able to respond during their daily activities. The percentage of NA responses for each coping item, of 11,136 responses, was as follows: active coping, 24.99%; reappraisal, 29.59%; distraction, 12.61%; fantasizing, 25.70%; self-blame, 34.58%; venting, 20.55%. Hence, there was a moderate amount of NA responses, averaging 24.97% of 11,136 responses. However, the number of analyzable data point remained very high even after excluding nonresponses and NA responses, averaging 21.42 observations per participant for a sample of 390 participants. All NA responses were treated as missing data.

**Mindfulness–Affect Dynamic Relationships**

We first examined the individual relationships between mindfulness and affect dynamics without controlling for the five related dispositional variables (openness, habitual reappraisal, habitual suppression, depression, and self-esteem). Thereafter, we repeated the analyses, but controlling for these traits, focusing on whether those mindfulness-affect dynamic relationships that were significant without the dispositional variables remained significant. This sequence of analyses is important for ruling out the possibility of suppressor effects from the dispositional variables distorting the relationships between mindfulness and the affect dynamic indicators.2

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2 Although distraction can be an effective emotion regulation strategy in some situations (e.g., Huffziger & Kuehner, 2009), it has also been conceptualized as a form of experiential avoidance, and implicated as a common pathological process across various psychological disorders (Chawla & Ostafin, 2007). Our research assumes this theoretical perspective when assessing distraction as a coping strategy. Also, results from factor analysis suggest that distraction belongs better in the maladaptive coping category than the adaptive coping category in this study.

3 Replicating past findings, mindfulness was positively related to openness, \(r(390) = .11, p = .03\), reappraisal, \(r(386) = .35, p < .001\), and self-esteem, \(r(389) = .35, p < .001\), and negatively related to suppression, \(r(386) = -.18, p = .001\), and depression, \(r(390) = -.46, p < .001\).
Affect variability. The SD for negative affect$_{mean}$ and positive affect$_{mean}$ were computed across observations to give positive affect$_{SD}$ and negative affect$_{SD}$ that reflect negative and positive affect variability over two days (see Table 1 for descriptive statistics). Using separate regression analyses in which each emotion variability was regressed onto trait mindfulness, mindfulness was found to predict negative affect$_{SD}$, $B = -0.08, SE = 0.02, p < .001$, but not positive affect$_{SD}$, $B = -0.01, SE = 0.02, p = .90$ (see Table 2). Hence, participants scoring high on trait mindfulness were less likely to experience extreme levels of negative affect compared to those scoring low. Controlling for the related dispositional variables, mindfulness continued to negatively predict negative affect$_{SD}$ but the effect became marginally significant (see Table 2).

Affect instability. MSSD scores were computed from negative affect$_{mean}$ and positive affect$_{mean}$. Respective MSSD scores were computed across observations separately for each day, and then averaged across days, giving negative affect$_{MSSD}$ and positive affect$_{MSSD}$ (see Table 1). High scores represent higher instability. Regression analyses showed that mindfulness did not predict positive affect$_{MSSD}$, $B = .01, SE = .05, p = .88$, but negatively predicted negative affect$_{MSSD}$, $B = -.16, SE = .05, p = .001$. Hence, more mindful participants exhibited less instability in their negative affect than their less mindful counterparts. Also, as shown in Table 2, mindfulness remained negatively related to negative affect$_{MSSD}$, with the related distributions controlled for.

Affect inertia and switch. All four affect inertia and switch outcomes could be tested in the same regression models and are hence discussed together. We first examined these processes at the 30-min intervals between observations.

Observation level. To examine inertia and switch at 30-min intervals (i.e., observation level), Hierarchical Linear Modeling (HLM; Raudenbush & Bryk, 2002) was employed. One approach would be to conduct two Level 1 analyses, one specifying negative affect (i.e., negative affect) and positive affect (i.e., positive affect) at observation $t$ to predict negative affect at the next observation $t+1$ (negative affect$_{t}^{-1}$), and the other specifying the same predictors to predict positive affect$_{t+1}$ (Pe & Kuppens, 2012). A positive relationship between negative affect, and negative affect$_{t+1}$ would indicate negative affect inertia; whereas a positive relationship between positive affect, and positive affect$_{t+1}$ would reflect positive affect inertia. For affect switch, a positive relationship between positive affect, and negative affect$_{t+1}$ would indicate positive-to-negative affect switch, controlling for negative affect at $t$; whereas a positive relationship between negative affect, and positive affect$_{t+1}$ would indicate negative-to-positive affect switch, controlling for positive affect at $t$. Mindfulness (centered) was added at Level 2 to predict all Level 1 parameters, with all Level 2 error terms specified. The analyses showed that both negative affect, and positive affect, positively predicted negative affect$_{t+1}$ and negative affect$_{t-1}$, all $\beta$s $>.03$, $p < .01$, showing evidence of both forms of inertia and both forms of switches. However, mindfulness moderated none of these relationships, absolute $\beta$s $< .02$, $p > .25$.

However, to examine whether the negative affect inertia also reflected lower level of positive affect at $t+1$, and whether the positive-to-negative switch also meant lower level of positive affect at $t+1$, we computed a difference score in which positive affect$_{t+1}$ was subtracted from negative affect$_{t+1}$, giving NA-PA$_{t+1}$. More positive (vs. negative) NA-PA$_{t+1}$ scores imply higher (lower) levels of negative affect relative to positive affect at $t+1$. Likewise, to examine whether the positive affect inertia also meant lower level of negative affect at $t+1$, and whether the negative-to-positive switch also meant lower level of negative affect at $t+1$, we computed a difference score in which negative affect$_{t+1}$ was subtracted from positive affect$_{t+1}$, giving PA-NA$_{t+1}$. More positive (vs. negative) PA-NA$_{t+1}$ scores imply higher (lower) levels of positive affect relative to negative affect at $t+1$. Note however that NA-PA$_{t+1}$ and PA-NA$_{t+1}$ are mathematically opposites, hence, all four inertia and switch processes can be tested in the same regression model on either NA-PA$_{t+1}$ or PA-NA$_{t+1}$.

We tested one HLM model in which NA-PA$_{t+1}$ was regressed onto positive affect, and negative affect, at Level 1. A positive relationship between negative affect, and NA-PA$_{t+1}$ would imply that the more negative affect was felt at $t$, the more likely it was that more negative affect relative to positive affect was experienced at $t+1$ (i.e., negative affect inertia), controlling for positive affect at $t$. The reverse would be true for positive affect inertia: a negative relationship between positive affect, and NA-PA$_{t+1}$ would imply that the more positive affect was felt at $t$, the more likely it was that more positive affect relative to negative affect was experienced at $t+1$ (i.e., inertia), controlling for negative affect at $t$. A positive relationship between positive affect, and NA-PA$_{t+1}$ would imply that the stronger was the positive affect at $t$, the greater the likelihood that negative affect was stronger than positive affect at $t+1$ (i.e., positive-to-negative switch), controlling for negative affect at $t$. The reverse would be true for negative-to-positive affect switch. Mindfulness (centered) was

| Table 1: Descriptive Statistics of Mindfulness, Affect Dynamics, and Coping Variables |
|-------------------------------|---------|---------|---------|---------|
| Variable                      | $M$     | $SD$    | Min     | Max     |
| Mindfulness                   | 4.70    | .82     | 2.27    | 6.80    |
| Negative affect$_{SD}$        | .63     | .36     | .00     | 1.87    |
| Positive affect$_{SD}$        | .76     | .29     | .05     | 1.89    |
| Positive affect$_{MSSD}$      | .67     | .79     | .00     | 6.28    |
| Negative affect$_{MSSD}$      | .87     | .75     | .00     | 5.67    |
| Negative affect$_{afternoon}$ | 1.66    | .71     | 1.00    | 5.98    |
| Negative affect$_{morning}$   | 2.39    | .81     | 1.10    | 5.97    |
| Positive affect$_{morning}$   | 1.59    | .67     | 1.00    | 6.17    |
| Positive affect$_{afternoon}$ | 2.36    | .85     | 1.03    | 6.24    |
| Adaptive coping$_{afternoon}$ | 3.20    | 1.00    | 1.00    | 5.83    |
| Maladaptive coping$_{afternoon}$ | 2.49    | 1.00    | 1.00    | 6.03    |
| Adaptive coping$_{morning}$   | 3.23    | 1.00    | 1.00    | 6.15    |
| Maladaptive coping$_{morning}$| 2.58    | .83     | 1.00    | 5.88    |

$^{1}$An alternative approach to measure the relative level of both emotions would be to use the residuals obtained from regressing one emotion onto the other. We chose the difference scores approach because, as would be clear later, it aids interpretation and produces similar findings as residual approach.

$^{2}$Differences scores should be interpreted cautiously. For instance, a positive relationship between negative affect, and NA-PA$_{t+1}$, may not necessarily imply negative affect inertia because all NA-PA$_{t+1}$ scores might be negative, which would mean that high negative affect in the morning could be associated with greater positive relative to negative affect in the afternoon (i.e., no inertia) even if negative affect, and NA-PA$_{t+1}$, was positively correlated. However, as would be clear later, this was not the case in the current findings.
Table 2

Standardized Regression Coefficients of Mindfulness Predicting Affect Dynamics Controlling and Without Controlling for Related Dispositional Variables (Dispositional Openness, Habitual Reappraisal, Habitual Suppression, Depression, and Self-Esteem)

<table>
<thead>
<tr>
<th>Variable</th>
<th>NA variability (OV: NA_{AGD})</th>
<th>PA variability (OV: PA_{AGD})</th>
<th>&gt;NA instability (OV: NA_{AGD})</th>
<th>PA instability (OV: PA_{AGD})</th>
<th>Morning-to-afternoon NA inertia; NA-to-PA switch (OV: NA(\rightarrow)PA_{afternoon})</th>
<th>Morning-to-afternoon PA inertia; PA-to-NA switch (OV: PA(\rightarrow)NA_{afternoon})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mindfulness (MF)</td>
<td>.18*** [.23, .08]</td>
<td>.05 [.10, .09]</td>
<td>.17∗ [.27, .07]</td>
<td>.01 [.09, .11]</td>
<td>.12∗ [.19, .04]</td>
<td>.10∗ [.03, .18]</td>
</tr>
<tr>
<td>NA_{morning}</td>
<td>.37∗ [.29, .48]</td>
<td></td>
<td></td>
<td></td>
<td>.46∗ [.55, .37]</td>
<td>.63, [80]</td>
</tr>
<tr>
<td>PA_{morning}</td>
<td></td>
<td>.70∗ [.79, .62]</td>
<td></td>
<td></td>
<td>.72∗ [.63, 80]</td>
<td>.63, [80]</td>
</tr>
<tr>
<td>MF × NA_{morning}</td>
<td>.15∗ [.23, .07]</td>
<td></td>
<td></td>
<td></td>
<td>.03 [.10, .05]</td>
<td>.03 [.10, .05]</td>
</tr>
<tr>
<td>MF × PA_{morning}</td>
<td>.03*** [.00, .00]</td>
<td>.37∗ [.45, .84]</td>
<td>.04 [.53, .35]</td>
<td>.06 [.03, .15]</td>
<td>.00 [.00, .10]</td>
<td>.02 [.12, .09]</td>
</tr>
<tr>
<td>R²</td>
<td>.00</td>
<td>.00</td>
<td>.03∗ [.00, .00]</td>
<td>.00</td>
<td>.47∗ [.45, .84]</td>
<td>.45∗ [.45, .84]</td>
</tr>
</tbody>
</table>

**Note.** PA: positive affect; NA: negative affect; MF × NA_{morning}: cross-product term between MF and NA_{morning}; MF × PA_{morning}: cross-product term between MF and PA_{morning}; NA-PA: NA minus PA; PA-NA: PA minus NA. In each analysis, outcome variable (OV) was regressed onto the stated predictor variables.

† p < .10. ‡ p < .05. ** p < .01. *** p < .001.

By adding the Level 2 predictor of all Level 1 parameters and Level 2 error terms were also entered. Of primary interest was whether mindfulness predicted the relationship between negative affect, and NA-PA_{t+1} and the relationship between positive affect, and NA-PA_{t+1}.

The analyses showed that negative affect, positively predicted NA-PA_{t+1}; β = .06, p < .001, 95% CI [.04, .08]. However, mindfulness did not moderate this relationship, β = -.004, p = .76, 95% CI [-.03, .02]. These results imply that mindfulness did not moderate both negative affect inertia and negative-to-positive affect switch at the observation level. Positive affect, negatively predicted NA-PA_{t+1}; β = -.13, p < .001, 95% CI [-.15, -.11], and neither was this relationship moderated by mindfulness, β = .002, p = .88 95% CI [-.02, .03], indicating that mindfulness also did not moderate observation-level positive affect inertia and positive-to-negative affect switch. Mindfulness did not moderate the relationships between negative affect, and NA-PA_{t+1} and between positive affect, and NA-PA_{t+1}, when the five dispositional variables were entered as Level 2 predictors of these relationships, absolute βs < .08, ps > .52. |

**Half-day level.** Given that affect changes have been found to occur over several hours, such as from morning to evening (e.g., Cowdry, Gardner, O’Leary, Leibenluft, & Rubinow, 1991), we examined whether mindfulness might moderate affect inertia and switch from morning to afternoon. We averaged the affect scores into two periods, morning (8am to 12 p.m.) and afternoon (12:30 p.m. to 5 p.m. [Day 1] or 6 p.m. [Day 2]), separately for each day. Prior analyses indicated similar patterns of findings over the two days, and hence, we averaged the respective scores for positive affect and negative affect over both days, giving negative affect_{morning}, negative affect_{afternoon}, positive affect_{morning} and positive affect_{afternoon} (see Table 1 for descriptive statistics).

We conducted moderation analyses, following the same considerations made in the observation-level analyses. We first analyzed the data using the traditional approach that does not account for the opposes-valence affect (e.g., changes in positive affect not being considered in negative affect inertia). We regressed negative affect_{afternoon} onto regressed on negative affect_{morning}, positive affect_{morning}, mindfulness, the cross-product interaction term between negative affect_{morning} and mindfulness, and the cross-product interaction term between positive affect_{morning} and mindfulness (all predictors were standardized). The analysis was repeated with positive affect_{afternoon} as outcome. Negative affect_{morning}, negative affect_{afternoon}, positive affect_{morning} and positive affect_{afternoon} (see Table 1 for descriptive statistics).

Another widely used method to examine affect inertia is to compute the auto-correlations between successive observational points (i.e., ACORR). ACORRs for negative and positive affect were computed at the observation level. Regression analyses found that mindfulness did not predict both negative affect_{ACORR} β = .003, p = .95, 95% CI [.02, .03], and positive affect_{ACORR} β = .02, p = .64, 95% CI [.02, .04], supporting the HLM findings.

7 12 p.m. was treated as a morning observation because participants were instructed to think of a referent event from 15 min prior and also to even out the number of observations between the two time periods.

8 Most importantly, with regard to analyzing differences between negative and positive affect at time _t_ as the outcome variable, in both Day 1 and 2, the critical interaction term for the analysis for negative affect inertia and negative-to-positive affect switch was significant and negative in direction, both βs < -.14, ps < .002, whereas the interaction term for the analysis for positive affect inertia and positive-negative affect switch was nonsignificant, absolute βs < .03, ps > .54. Simple effect analyses of the significant interactions also produced the same results across days.
affect\textsubscript{morning} and positive affect\textsubscript{morning} positively predicted both negative affect\textsubscript{afternoon} and positive affect\textsubscript{afternoon}, $\beta > .13$, $p < .01$, evidencing both forms of inertia and of switches. Mindfulness moderated negative affect inertia, $\beta = -.17$, $p > .001$, such that higher mindfulness was indeed associated with weaker negative inertia; no other moderation effect was found, absolute $\beta$s $< .05$, $p > .07$. However, we withhold further interpretation as our focus is on the analyses that take into account the opposite-valence affect.

To this end, we computed a difference score in which positive affect\textsubscript{afternoon} was subtracted from negative affect\textsubscript{afternoon}, giving NA-PA\textsubscript{afternoon}. NA-PA\textsubscript{afternoon} was regressed onto positive affect\textsubscript{morning}, negative affect\textsubscript{morning}, mindfulness, and the cross-product interaction term between negative affect\textsubscript{morning} and mindfulness (all predictors were standardized). The interaction term would test whether mindfulness moderated morning-to-afternoon negative affect inertia and negative-to-positive affect switch. As shown in Table 2, negative affect\textsubscript{morning} positively predicted, and mindfulness negatively predicted, NA-PA\textsubscript{afternoon}. Critically, these relationships were qualified by the interaction effect between negative affect\textsubscript{morning} and mindfulness, which was statistically significant. Repeating the same analysis but controlling for the five related dispositional variables, this interaction effect remained significant (and in the same direction).

Simple effect parameters were next estimated, at 2 $SD$ from the mean of the predictor and the moderator (instead of the conventional 1$SD$) so as to more vividly demonstrate the moderating effects of mindfulness. The results are graphed in Figure 1A. The positive relationship between negative affect\textsubscript{morning} and NA-PA\textsubscript{afternoon} was significant at low levels of mindfulness, $\beta = .68$, $p < .001$, 95% CI [.51, .86]. Hence, individuals low on trait mindfulness showed evidence of negative affect inertia; the more negative they felt in the morning, the more likely that they would feel more negative affect relative to positive affect in the afternoon. In contrast, the relationship between negative affect\textsubscript{morning} and NA-PA\textsubscript{afternoon} was not significant at high levels of mindfulness, $\beta = .08$, $p = .25$, 95% CI [-.16, .32], indicating no evidence of negative affect inertia. Also, at high levels of negative affect\textsubscript{morning}, there was a significant and negative relationship between mindfulness and NA-PA\textsubscript{afternoon}, $\beta = -.42$, $p < .001$, 95% CI [-.66, -.18], indicating that after a strong negative affective experience in the morning, individuals high on trait mindfulness were less likely to experience more negative affect relative to positive affect in the afternoon. It is also noteworthy that, at high levels of negative affect\textsubscript{morning}, the NA-PA\textsubscript{afternoon} scores for the participants low on trait mindfulness were positive. In other words, after experiencing high levels of negative affect in the morning, participants low on mindfulness reportedly felt more negative affect (relative to positive affect) in the afternoon, demonstrating negative affect inertia. However, at high negative affect\textsubscript{morning}, NA-PA\textsubscript{afternoon} was negative for participants high on mindfulness. This is indicative of negative-to-positive affect switch; following strong negative affective experiences in the morning, participants high on mindfulness reported stronger positive (relative to negative) affect in the afternoon.

In the second analysis, negative affect\textsubscript{afternoon} was subtracted from positive affect\textsubscript{afternoon}, giving PA-NA\textsubscript{afternoon}, which was regressed onto negative affect\textsubscript{morning}, positive affect\textsubscript{morning}, mindfulness, and the cross-product interaction term between positive affect\textsubscript{morning} and mindfulness (all predictors were standardized). In this model, the interaction term would test whether mindfulness moderated morning-to-afternoon positive affect inertia and positive-to-negative affect switch. As shown in Table 2, positive affect\textsubscript{morning} and mindfulness positively predicted PA-NA\textsubscript{afternoon}. However, there was no significant interaction effect. Hence, mindfulness did not moderate both positive affect inertia and positive-to-negative affect switch at the morning-to-afternoon level (see Figure 1B).

### Mediation Role of Coping on Mindfulness–Affect Dynamic Relationships

In sum, mindfulness was negatively associated with low variability and instability in negative affect and morning-to-afternoon negative affect inertia, and was positively associated with morning-to-afternoon negative-to-positive affect switch. We next examined whether these relationships were statistically mediated by adaptive coping and maladaptive coping.

**Affect variability and affect instability.** The bootstrap resampling procedure (Preacher & Hayes, 2004) was used to examine whether adaptive and maladaptive coping each mediated the asso-

![Figure 1](https://example.com/figure1.png)

**Figure 1.** Interaction effect between affect in the morning and mindfulness on NA-PA\textsubscript{afternoon} (A) and PA-NA\textsubscript{afternoon} (B). Full lines: high mindfulness; dotted lines: low mindfulness. NA: negative affect; PA: positive affect. Negative affect inertia and negative-to-positive affect switch are illustrated in panel A; positive affect inertia and positive-to-negative affect switch are illustrated in panel B.
cation between mindfulness and negative affect variability, and the association between mindfulness and negative affect instability. Separate analyses were conducted for adaptive and maladaptive coping. In each analysis, mindfulness was entered as the predictor variable and affect dynamic the outcome variable. As outcome variables were aggregate scores reflecting variability and instability across observations, we averaged the coping scores across observations to create mean adaptive and maladaptive coping to maintain consistency. Bootstrapping was accomplished by taking 5000 random samples of the original sample and computing the ab product for each mediator in each sample. The point estimate of the indirect effect is the mean of the ab product over 5000 samples. The procedure yields a 95% bias-corrected (BCa) confidence interval (CI). If the upper and lower limits of the CI do not contain zero, the indirect effect is significant. We also report results of individual paths to examine whether the relationships were in the predicted direction and whether the mediation effect was full or partial. A mediation effect is considered full if the direct effect from IV to DV becomes nonsignificant after inclusion of the mediator; the effect is partial if the direct effect becomes smaller but remains significant. All results are presented in Table 3.

The analyses showed that the association between mindfulness and negative affect was significantly mediated by lower use of maladaptive coping. The association between mindfulness and negative affect was also statistically mediated by lower maladaptive coping. In both cases, the mediation effects were partial. Neither of the associations was mediated by adaptive coping.

### Affect inertia and affect switch
Mediated moderation analysis was conducted to examine whether adaptive and maladaptive coping mediated the relationships between mindfulness and both morning-to-afternoon negative affect inertia and negative-to-positive affect switch. Both relationships were tested in the same analyses. As outlined in Muller, Judd, and Yzerbyt (2005), mediated moderation analysis requires running of the following regression models:

\[
OV = b_0 + b_{MP}CP + b_{MP}MP + b_{Med}Med + b_{MP\times Med}MP \times Mod + e
\]

Model 1

\[
Med = b_0 + b_{MP}CP + b_{MP}MP + b_{Med}Med + b_{MP\times Med}MP \times Mod + e
\]

Model 2

\[
OV = b_0 + b_{MP}CP + b_{MP}MP + b_{Med}Med + b_{MP\times Med}MP \times Mod + e
\]

Model 3

OV, CP, MP, Mod, and Med refer to outcome variable, controlling predictor, main predictor, moderator, and mediator, respectively; ^ denotes interaction between specific variables. To establish mediated moderation, the following conditions need to be established. First, Condition 1 requires that MP interacts with Mod to predict OV in Model 1. Second, Condition 2 must be met in one of two ways. Condition 2a: MP \times Mod interaction predicts Med in Model 2 (2a.i) and Med predicts OV in Model 3 (2a.ii). Alternatively, Condition 2b: MP predicts Med in Model 2 (2b.i) and Med \times Mod predicts OV in Model 3 (2b.ii). Third, Condition 3 must be fulfilled, as follow: MP \times Mod interaction effect is reduced in magnitude in Model 3 relative to Model 1. The controlling predictor is required only for the current purpose of controlling for positive affect and is not discussed further.

Unlike affect variability and instability, the mediation analysis for affect inertia and switch examined changes from morning to afternoon. Hence, we operationalized coping as change in coping from morning to afternoon by averaging the coping scores within each period and subtracting the coping scores in the morning from those in the evening, giving adaptive coping and maladaptive coping. Conceptualizing change as difference scores is consistent with the use of difference scores to index the outcomes for inertia and switch and aid interpretation. Similar results were obtained with residual scores. To test the mediating effect of adaptive coping on the relationship between mindfulness and negative affect inertia, NA-PA after, was entered as OV, positive affect change as CP, negative affect change as MP, mindfulness as Mod, and adaptive coping as Med. Hence, the model tested whether the moderating effect of mindfulness on changes in negative affect from morning to afternoon was statistically mediated by changes in adaptive coping across the same time periods. The results contain the necessary information regarding the mediating effect of adaptive coping on the mindfulness-negative-to-positive switch relationship because the OV for negative-to-positive affect switch was PA-NA after. The same model was repeated to test the mediating effect of maladaptive coping.

### Table 3
<table>
<thead>
<tr>
<th>Condition</th>
<th>Model</th>
<th>Path Coefficient</th>
<th>CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2a.i</td>
<td>0.24</td>
<td>[.12, .36]</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>2b.i</td>
<td>0.04</td>
<td>[.01, .07]</td>
<td>.04</td>
</tr>
<tr>
<td>2a.ii</td>
<td>0.04</td>
<td>[.02, .06]</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>2b.ii</td>
<td>0.03</td>
<td>[.01, .06]</td>
<td>.01</td>
<td></td>
</tr>
</tbody>
</table>

9 We ran additional mediational analyses using morning coping and afternoon coping as a mediator in separate models, and found that neither mediated any of the inertia and switch processes. In each of these analyses, one or more conditions of the mediated moderation model were not met.
negative affect inertia and to switch from negative affect to positive affect from morning to afternoon (compared with their less mindful counterparts) was in part because they were less likely to persist in using maladaptive coping styles from morning to afternoon. Note however that the mediation was only partial and the decrease in magnitude of the interaction effect between mindfulness and negative affect inertia and to switch from negative affect to positive affect in the morning to feeling positively in the afternoon, compared to participants low on trait mindfulness. These associations largely remained after accounting for related dispositional constructs, namely openness, habitual reappraisal, habitual suppression, depression, and self-esteem, and were partially mediated by lower use of maladaptive coping.

The finding that mindfulness predicted lower variability of daily negative affect is consistent with findings of recent studies (Adams et al., 2014; Hill & Updegraff, 2012). The negative association between trait mindfulness and instability of negative affect further indicated that beyond experiencing a narrower range of negative affect in general, individuals who are mindful in fact experience lower levels of time-dependent fluctuations of negative affect throughout the day, compared with those low on trait mindfulness. These findings corroborate results from laboratory-based experimental studies showing that mindfulness is associated with reduced subjective or physiological reactivity to emotional stressors (Arch & Craske, 2006; Erisman & Roemer, 2010; Orner et al., 2007; Wolgast, Lundh, & Viborg, 2011), and extend these results by demonstrating the association between mindfulness and lower affect reactivity in the context of everyday life. The study further demonstrated that lower use of maladaptive coping may be a mechanism underlying the association between mindfulness and reduced affective reactivity. Specifically, individuals who are more mindful may be less inclined to resort to use of maladaptive strategies as a coping mechanism (Hamilton et al., 2006), which helps attenuate their reactivity to daily stressors. Interestingly, use

Table 3
Standardized Regression Coefficients Indicating Mediating Effect of Adaptive Coping and Maladaptive Coping on the Relationships Between Mindfulness and Negative Affect Variability (Negative Affect_{SD}) and Negative Affect Instability (Negative Affect_{MSSD})

<table>
<thead>
<tr>
<th>Outcome variable (OV)</th>
<th>Mediator</th>
<th>Predictor variable (PV) to mediator (path a)</th>
<th>PV to OV (path b)</th>
<th>Direct effect from PV to OV (before mediation; c path)</th>
<th>Direct effect from PV to OV (after mediation; c' path)</th>
<th>Indirect effect of PV to OV via mediator</th>
<th>95% CI of indirect effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative affect_{SD}</td>
<td>Adaptive coping_{mean}</td>
<td>.06</td>
<td>.14**</td>
<td>-.18***</td>
<td>-.19***</td>
<td>.01</td>
<td>[-.01, .03]</td>
</tr>
<tr>
<td>Negative affect_{MSSD}</td>
<td>Adaptive coping_{mean}</td>
<td>.06</td>
<td>.12*</td>
<td>-.17*</td>
<td>-.12*</td>
<td>.06**</td>
<td>[-.11, -.03]</td>
</tr>
<tr>
<td></td>
<td>Maladaptive coping_{mean}</td>
<td>-17**</td>
<td>.32***</td>
<td>-.17**</td>
<td>-.12*</td>
<td>-.05**</td>
<td>[-.10, -.02]</td>
</tr>
</tbody>
</table>

Note. In each analysis, mindfulness was entered as the predictor variable. *p < .05. **p < .01. ***p < .001.

Discussion

The present study aimed to investigate the associations between trait mindfulness and several aspects of affect dynamics in daily life, in particular, affect variability, inertia, switch, and instability, and whether these associations, if any, were accounted for by use of adaptive or maladaptive coping strategies. As hypothesized, trait mindfulness negatively predicted variability and instability of negative affect. Higher levels of trait mindfulness also predicted lower levels of negative affect inertia, measured at half-day intervals (morning to afternoon), indicating that individuals who are mindful are less likely to continue to linger on negative emotions within a day. Trait mindfulness was also associated with affect switch in interesting ways; in particular, participants high on trait mindful are less likely to continue to linger on negative emotions throughout the day, compared with those low on trait mindfulness. These associations largely remained after accounting for related dispositional constructs, namely openness, habitual reappraisal, habitual suppression, depression, and self-esteem, and were partially mediated by lower use of maladaptive coping.

Table 4
Standardized Regression Coefficients Indicating Mediating Effect of Change in Adaptive Coping and in Maladaptive Coping on the Relationships Between Mindfulness and Negative Affect Inertia and Negative-to-Positive Affect Switch

<table>
<thead>
<tr>
<th>Model</th>
<th>PA_{morning}</th>
<th>NA_{morning}</th>
<th>Mindfulness (MF)</th>
<th>MF \times NA_{morning}</th>
<th>Mediator: Adaptive coping_{change}</th>
<th>MF \times Mediator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>-.70*** (.79, -.62)</td>
<td>.38*** (.29, .48)</td>
<td>-.12** (-.19, -.04)</td>
<td>-.15*** (-.23, -.07)</td>
<td>.09 (.01, .16)</td>
<td>-.01 (-.08, -.07)</td>
</tr>
<tr>
<td>Model 2</td>
<td>.04 (-.07, .15)</td>
<td>-.14 (-.26, -.01)</td>
<td>.03 (-.07, .14)</td>
<td>-.05 (-.16, .06)</td>
<td>.06 (-.04, .17)</td>
<td>-.11 (-.22, .00)</td>
</tr>
<tr>
<td>Model 3</td>
<td>-.70 (-.79, -.62)</td>
<td>.39*** (.30, .49)</td>
<td>-.12** (-.20, -.04)</td>
<td>-.15*** (-.23, -.07)</td>
<td>.09 (.01, .16)</td>
<td>-.01 (-.08, -.07)</td>
</tr>
</tbody>
</table>

Mediator: Maladaptive coping_{change}

| Model 1 | -.70*** (-.79, -.62) | .26*** (.29, .48) | -.12** (-.19, -.04) | -.15*** (-.23, -.07) | .09 (.01, .16) | -.01 (-.08, -.07) |
| Model 2 | .08 (-.04, .19) | -.26*** (-.39, -.14) | .06 (-.04, .17) | -.11 (-.22, .00) | .06 (-.04, .17) | -.11 (-.22, .00) |
| Model 3 | -.71*** (-.79, -.63) | .41*** (.32, .52) | -.11** (-.19, -.04) | -.12** (-.20, -.04) | .10 (.02, .17) | .12 (.04, .19) |

Note. PA: positive affect; NA: negative affect. (mal)adaptive coping_{change}: (mal)adaptive coping_{morning} minus (mal)adaptive coping_{afternoon}. Outcome variable for Models 1 and 3 was NA-PA_{afternoon}. outcome variable for Model 2 was the stated mediator. In parentheses are 95% CI.

1 p < .10. 2 p < .05. 3 p < .01. 4 p < .001.
of adaptive coping did not mediate the association between trait mindfulness and negative affect variability or instability, suggesting that in this context, being mindful exerts its impact on emotional well-being primarily through the interruption of maladaptive coping styles, as opposed to promotion of adaptive coping styles. It should be noted that our assessment of adaptive coping styles encompasses only two coping strategies (i.e., reappraisal and active coping) and not others (e.g., seeking social support), and it is unclear whether a broader assessment of adaptive coping styles would yield different results.

To the authors’ knowledge, the present study is the first to investigate the association between trait mindfulness and affect inertia. The finding that mindfulness predicted lower levels of negative affect inertia suggests that mindful people are less likely to dwell on negative emotions throughout the day. The finding corroborates the idea that being mindful promotes a nonjudgmental attitude toward one’s psychological experiences, which facilitates the ability to disengage effectively from the emotional ups and downs of daily life. The present study is also likely the first to examine the association between mindfulness and affect switch. Participants high on mindfulness were more likely to switch from experiencing negative affect to positive affect within a day, which is consistent with the idea that mindful individuals, compared with their less mindful counterparts, are more effective at regulating their emotions (Baer et al., 2006). The mediational analyses also suggest that reductions in use of maladaptive coping may be a mechanism underlying the ability of these individuals to not linger in negative emotions, as well as to bounce back from negative emotions earlier in the day to positive emotions later in the day.

Notably, the present study showed a lack of association between trait mindfulness and variability, instability, and inertia of positive affect. Taking current and past findings into consideration, the relationship between trait mindfulness and positive affective experiences remains unclear. For instance, past studies have produced inconsistent findings with regard to the relationship between mindfulness and average positive affect. While one study did not find an association between trait mindfulness and average positive affect (Brown & Ryan, 2003), another study showed that trait mindfulness was positively associated with daily pleasant affect (Brown, Ryan, & Creswell, 2007). Another study, however, found that systematic training in mindfulness increased momentary positive affect in adults with a history of depression and residual depressive symptoms (Geschwind, Peeters, Drukker, van Os, & Wichers, 2011). It may be that the relationships between trait mindfulness and positive affective experiences depend on the type of positive affect (e.g., low vs. high arousal positive affect); future research is required to examine this issue.

The strengths of the study include the use of EMA, which enabled a more unbiased assessment of affect compared to a global self-report method. The study also recruited a multiethnic Asian sample, which expands the cultural scope of research on affect dynamics and mindfulness. Further, we obtained a large sample of 390 participants, far larger than most affect dynamic studies, which increases the reliability of the findings. However, with a rather large sample size, small effects can become significant and some of the studied relationships indeed have small effect sizes. The effect sizes are comparable with those found in some studies on the association between depression and affect dynamics (e.g., Koval et al., 2012), but not others (Koval et al., 2013). Particularly, Koval et al. (2013) found that the effect sizes for the relationship between depression severity and emotional inertia, variability, and instability generally fell within the moderate range (i.e., ranging between .25 and .32), whereas in the present study the strengths of the association between mindfulness and these affect dynamics indicators were smaller (i.e., below .20). Although the differences in effect sizes could be attributable in part to methodology (e.g., Koval et al. preselected participants to represent a wide range of depressive symptoms, which might have amplified the variance and possibly effect size of the predictor), the findings suggest that compared with trait mindfulness, there may be other variables more strongly associated with affect dynamics. Future research should examine the relative predictive value of mindfulness versus other predictors of affect dynamics that have been established in the literature.

The limitations of this study should be mentioned. First, the relationships found may reflect unmeasured situation-selection processes or stress-related processes linked to mindfulness. For example, people high on mindfulness may have a tendency to select and tackle challenging situations due to an increased sense of self-efficacy. Future research should examine how situational or stress appraisal variables interact with trait mindfulness to impact affect dynamics. Also, the 30-min assessment interval might have been too frequent (and taxing) for participants. However, we did not receive such feedback from participants. Large intervals could miss out important short-term changes, whereas small intervals could increase participation burden. The current 30-min was chosen as a balance between these considerations and previous studies have employed such intensive sampling without sacrificing compliance rate (e.g., Ebner-Priemer et al., 2007; Koval & Kuppens, 2012).

Another limitation is that we did not assess affective experiences in the evening or measure them beyond two days, as doing so would increase participation burden. However, the current time window still captured sufficient variations in affective experiences to support several hypotheses. Further, future studies should go beyond the current single-factor conceptualization of trait mindfulness to examine a multifaceted construct that captures both attentional and attitudinal components of mindfulness (e.g., the tendency to be nonjudgmental toward one’s thoughts and emotions; Baer et al., 2006). The current findings are correlational. Future studies should adopt an experimental approach, for example, a randomized controlled study that examines the effects of systematic mindfulness training on various aspects of affect dynamics. Finally, we examined instability in global affect which comprises several discrete emotions of the same valence. Future research may examine within-valence instability, which concerns the speed of change between discrete emotions of the same valence. For instance, it is possible that highly mindful people are less likely to fluctuate rapidly between discrete negative emotions because of their lower tendency to engage in maladaptive coping.

In conclusion, the findings of this study suggest that trait mindfulness uniquely promotes adaptive patterns of affective experiences in daily life. Use of maladaptive coping is a mechanism that accounts for the relationship between mindfulness and several aspects of negative affect dynamics. Compared with previous research, this study contributes to a more refined and nuanced understanding of the nature of the association between mindfulness and patterns of emotional experiences in daily life, and could
have important implications for understanding the mechanisms through which mindfulness impacts emotional health.

References

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