

Pathways to Happiness Are Multidirectional:
Associations Between State Mindfulness and Everyday Affective Experience

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size, all data exclusions (if any), and all measures as relevant for the research questions. There were no manipulations.

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Abstract

Mindfulness is commonly defined as a multidimensional mode of being attentive to, and aware of, momentary experiences while taking a nonjudgmental and accepting stance. These qualities have been linked to two different facets of affective well-being: Being attentive is proposed to lead to an appreciation of experiences as they are, and thus to positive affect. Accepting unpleasant experiences in a nonjudgmental fashion has been hypothesized to reduce negative affect. Alternatively, however, attention may increase both positive and negative affectivity, whereas nonjudgmental acceptance may modify how people relate to their experiences.

Previous research has considered such differential associations at the *trait* level, although a mindful mode may be understood as a *state* of being. Using an experience-sampling methodology with smartphones, the present research therefore links different state mindfulness facets to positive and negative affect in daily life. Seventy students (50% female, 20–30 years old) of different disciplines participated in the study. Based on multidimensional assessments of self-reported state mindfulness and state affect, the findings corroborate the hypotheses on the differential predictive value of two mindfulness facets: Participants experienced more positive affect when they were attentive to the present moment and less negative affect when they nonjudgmentally accepted momentary experiences. Furthermore, only nonjudgmental acceptance buffered the impact of daily hassles on affective well-being. The study contributes to a more fine-grained understanding of the within-person mechanisms relating mindfulness to affective well-being in daily life. Future interventions may be able to enhance different aspects of affective well-being by addressing specific facets of mindfulness. 250/250 words

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Pathways to Happiness Are Multidirectional: Associations Between State Mindfulness and Everyday Affective Experience

A mindful state of mind is characterized by different qualities, most prominently the regulation of attention to the present moment as well as the acceptance of present-moment experiences with curiosity and without judgment (Bishop et al., 2004). Other conceptualizations of mindfulness include different qualities or facets, such as nonreactivity to experiences or acting with awareness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Brown & Ryan, 2003; for an overview, see Bergomi, Tschacher, & Kupper, 2013). Mindfulness has been associated with affective well-being and health (e.g., see meta-analysis by Grossman, Niemann, Schmidt, & Walach, 2004). Its different facets may serve different purposes in this regard: For example, in a study investigating changes in mindfulness and affect following mindfulness-based cognitive therapy, increases in attention regulation were associated with increases in positive affect (PA), whereas increases in acceptance were associated with decreases in negative affect (NA; Schroevers & Brandsma, 2010). Furthermore, nonjudgmental acceptance was shown to have a dampening effect on stress reactivity in adolescents and students (e.g., Ciesla, Reilly, Dickson, Emanuel, & Updegraff, 2012; Feldman, Lavalley, Gildawie, & Greeson, 2016). Relatedly, nonjudgmental acceptance was associated with less posttraumatic stress in combat veterans (Wahbeh, Lu, & Oken, 2011).

In these studies, mindfulness was conceptualized as an ability (a *trait*) rather than a present-moment experience, and hence assessed using generalized self-reports. It has, however, been argued that mindfulness can be best described as a *mode*, which may be more similar to a *state*; therefore, mindfulness is hypothesized to influence individual's mood on a momentary basis (Bishop et al., 2004). As Robinson and Clore (2002) highlighted, individuals draw on different types of information when providing self-reports of generalized tendencies or of trait characteristics (e.g., "How attentive are you in general ...?") as opposed to when providing self-

reports of experiences (e.g., “How attentive are you at the moment...?”). In the former case, semantic knowledge structures, such as beliefs about the self (e.g. “I am an attentive person”) are particularly relevant, whereas in the latter, references to episodic knowledge of actual experiences is necessary. Associations between both types of knowledge representations – semantic and episodic – can be loose. Thus, generalized reports diverge from aggregated state reports and have differential predictive value (e.g., Conner & Barrett, 2012).

In the present study, we therefore approach the question of whether various mindfulness facets are differentially related to affective well-being from the perspective of momentary within-person associations. That is, we investigate whether moments in which people pay attention to the present experience are moments in which they feel particularly good, and whether moments of nonjudgmental acceptance are those characterized by a particularly low level of NA. To do this, we employed experience-sampling methodology (ESM). In addition, we examine the moderating effect of mindfulness on affective reactivity in the presence of daily hassles. The latter notion is motivated by the hypothesis that mindfulness may function as a buffer to impaired affective well-being in times of stress (Brown, Weinstein, & Creswell, 2012; Creswell & Lindsay, 2014). Since research on state mindfulness is still quite sparse, we next briefly review the literature on these research questions at both the trait and state level. We thereby adopt a broad conceptualization of state mindfulness measures including assessments of mindfulness states during time intervals that span several hours up to a day (e.g., Eisenlohr-Moul, Peters, Pond, & DeWall, 2016). Even though such assessments do not capture mindfulness states at a given moment in time we nevertheless believe that they measure state mindfulness in the sense of being in a mindful mode where experiences are met with a mindful stance.

Associations between mindfulness facets and affective well-being

Within various theoretical frameworks, conceptualizations of trait mindfulness have been

shown to be associated with affective well-being (Baer et al., 2006; Brown & Ryan, 2003; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007). Different facets of trait mindfulness (such as present-moment attention, acting with awareness, or nonjudgmental acceptance), however, may serve different purposes. Differentiating them could thus help disentangle the salutary effects of mindfulness on PA and NA. On the one hand, it seems that mindfulness facets emphasizing the awareness of, and the attention to, present-moment experiences are strongly linked to positive affectivity (e.g., Quoidbach, Berry, Hansenne, & Mikolajczak, 2010). This may be due to a broadening of awareness which makes it possible to savor positive emotions (e.g., Garland, Farb, Goldin, & Fredrickson, 2015); or as Thich Nhat Hanh (1992) put it “*The present moment is filled with joy and happiness. If you are attentive, you will see it*” (p. 21). For example, Cameron and Fredrickson (2015) showed that attention to the present moment is related to positive emotionality when one helps another person. Interestingly, present-moment attention was not related to aspects of mood disorders in a study by Kohls, Sauer, and Walach (2009). In another study, increases in PA were associated with increases in the trait mindfulness facet acting with awareness (Schroevers & Brandsma, 2010). However, acting with awareness has also been linked to a decrease in negative affectivity and in psychological symptoms (e.g., Brown & Ryan, 2003).

On the other hand, the facet nonjudgment or (nonjudgmental) acceptance has broadly been associated with reduced negative affectivity and fewer psychological symptoms: In the study by Kohls et al. (2009), the acceptance factor of trait mindfulness was negatively associated with (sub-clinical) depression and anxiety scores in students. Similarly, increases in trait nonjudgmental acceptance were correlated with decreases in NA across an eight-week mindfulness-based cognitive therapy course (Schroevers & Brandsma, 2010).

Taken together, attention to the present moment may foster PA, whereas nonjudgmental

acceptance may dampen NA. However, according to the Monitor and Acceptance Theory (MAT; Lindsay & Creswell, 2017), attention to experience without acceptance may increase affective reactivity, both for PA and NA. Attention alone may therefore not suffice to foster emotional well-being, as shown for example by studies in which students with high monitoring skills (attention to present-moment experiences) but low nonjudgmental acceptance were characterized by unfavorable outcomes, such as depressive symptoms (e.g., Pearson, Lawless, Brown, & Bravo, 2015). In contrast, Lindsay and Creswell (2017) have pointed out, that a combination of high attentional monitoring and an accepting stance may lead to lower NA. Such synergetic effects have also been shown to decrease cravings for positive experiences, such as substance use (Eisenlohr-Moul, Walsh, Charnigo, Lynam, & Baer, 2012).

In essence, conceptual considerations as well as findings at the trait level suggest that different mindfulness facets may serve different functions with regard to people's typical affective well-being. Detailed insights regarding potentially differential associations of different facets of mindfulness *states* with people's momentary affective experiences, however, are lacking. Studies assessing state mindfulness as a composite measure (based on various facets without disentangling them) found state mindfulness to be associated with better momentary affective well-being (e.g., Lacaille, Sadikaj, Nishioka, Flanders, & Knäuper, 2015; Snippe, Nyklíček, Schroevers, & Bos, 2015). Preliminary evidence, however, suggests that, as is the case at the trait level, associations of different affect facets with momentary affective experiences may be multidirectional: For example, a short mindfulness instruction, especially promoting state curiosity (which is rooted in the present moment), has been shown to elicit positive emotionality (i.e., inspiration), even in the context of rather tedious activities such as dish-washing (Hanley, Warner, Dehili, Canto, & Garland, 2015). In the same vein, mind-wandering (the opposite of being aware and attentive) was associated with decreases in positive mood in daily life

(Killingsworth & Gilbert, 2010). The most researched state facet, acting with awareness, was related to both high levels of PA and low levels of NA at the state level (Brown & Ryan, 2003; Hülshager, Alberts, Feinholdt, & Lang, 2013; Hülshager et al., 2014; Lacaille et al., 2015; Snippe et al., 2015; Weinstein, Brown, & Ryan, 2009). Eisenlohr-Moul, Peters, Pond, and DeWall (2016) found that both state acting with awareness and state nonjudgment, but not state nonreactivity, were associated with decreases in daily anger (as assessed with a daily diary). Weekly fluctuations in nonjudgment furthermore predicted features of the borderline personality disorder (e.g., affective instability) in another study using the same diary procedure (Eisenlohr-Moul, Peters, Chamberlain, & Rodriguez, 2016).

These results are in accordance with findings at the trait level and point to the relevance of different state mindfulness facets. Nevertheless, a systematic analysis of the differential predictive value of several important state mindfulness facets in relation to both affect facets (PA and NA) has not been carried out to date. We address this research gap in the present study.

Does mindfulness buffer the adverse effect of daily hassles on affect?

As elaborated above, the various aspects of a mindful state should covary with affective experiences over time. Associations between mindfulness and affect have attracted particular interest in the context of research on stress reactivity. Indeed, mindfulness training such as mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) have been shown to reduce affective symptoms of anxiety and depression as well as stress reactivity (Britton, Shahrar, Szepsenwol, & Jacobs, 2012; Hoge et al., 2013). Furthermore, certain dispositional mindfulness facets have been found to play pivotal roles in stress reactivity. For example, acting with awareness attenuated the association between daily hassles and depression, anxiety, and stress in adolescents (Marks, Sobanski, & Hine, 2010). Acting with awareness was also associated with reduced NA reactivity, anxiety as well as cortisol levels when facing a social

stress test (Brown et al., 2012).

In another study, the trait mindfulness facets of nonreactivity and of nonjudgmental acceptance, but not acting with awareness, interacted with daily stressful events to predict less dysphoric mood in adolescents (Ciesla et al., 2012). The authors assumed that nonreactive and nonjudgmental individuals regard stressors as part of life without engaging in self-blame. In a study by Feldman et al. (2016), the facet nonjudgment (sometimes referred to as acceptance) was associated with lower emotional reactivity to unpleasant events in students. Peters, Eisenlohr-Moul, and Smart (2016) could show that only dispositional nonjudgment, but not other facets (including acting with awareness and nonreactivity) moderated the effect of rejection sensitivity on NA. That is, a nonjudgmental perspective may protect people high in rejection sensitivity from experiencing elevated levels of NA. Similarly, only nonjudgment, but not acting with awareness (as a trait) was associated with reduced symptoms of posttraumatic stress in combat veterans (Wahbeh et al., 2011).

These results imply that people who describe themselves as more nonjudgmental and accepting in general are also less reactive to stress and experience fewer psychopathological symptoms (e.g., pertaining to depression or posttraumatic stress). In the present study, we investigate whether moments in which individuals are more accepting are also moments in which their reactivity towards stressors is attenuated. We thus investigate the hypothesized mechanism from a process-oriented perspective that we regard as approximating theoretical notions on how mindfulness affects peoples' lives.

The present study: Hypotheses

Our aim was to investigate the meaning of different mindfulness facets on PA and NA. When differentiating mindfulness facets and their correlates, previous studies mostly relied on generalized accounts of mindfulness, which may be more strongly influenced by beliefs about

own behavior than by actual experiences (Robinson & Clore, 2002). In the present study, we assessed momentary experiences of mindfulness and affect as reported via ESM. We focused on three mindfulness facets that we have previously corroborated both at the state and the trait level: present-moment attention, acting with awareness, and nonjudgmental acceptance (Blanke & Brose, 2016). We hypothesized that present-moment attention is the facet that is most strongly associated with positive emotionality, as attention to the moment may enable people to see the positive side of a situation (e.g., Cameron & Fredrickson, 2015), even when pursuing everyday activities (e.g., dish-washing; see Hanley et al., 2015). We hypothesized that momentary nonjudgmental acceptance is associated with reduced negative emotionality, because accepting situations as they are may reduce negative thoughts and feelings (e.g., Cameron & Fredrickson, 2015; Kohls et al., 2009; Schroevers & Brandsma, 2010). We also examined the account proposed by MAT that attention to present-moment experiences alone may increase PA as well as NA, whereas present-moment attention and nonjudgmental acceptance together may lead to synergetic effects, decreasing at least NA, potentially also PA. We made no differential predictions for the facet acting with awareness, which has been shown to be associated to both enhanced positive and reduced negative affectivity in previous studies.

We furthermore assumed that one process through which mindfulness can improve well-being is its buffering effect on the impact of daily hassles on PA and NA. The facet nonjudgmental acceptance, in particular, should be related to the regulation of emotions in negative situations; as a trait, it has been shown to reduce stress reactivity (e.g., Ciesla et al., 2012; Feldman et al., 2016). However, at the trait level, other facets were shown to influence stress reactivity as well (e.g., acting with awareness; Marks et al., 2010). We therefore also

explored whether the other two facets also buffer stress reactivity.

Method

Participants

Our target sample size of 70 students of various disciplines aged between 20 and 30 years ($M = 25.55$, $SD = 2.74$ years) participated in the study ($n = 35$ female). This sample size was determined on the basis of previous experience sampling studies conducted by the authors. Participants were recruited via posters, online advertisements, and university mailing lists in the Berlin area, Germany. Students of psychology were eligible to participate only if they had been at the university for less than three semesters (only one student of psychology took part in the study). In the advertisements, we described the study as investigating students' thoughts and feelings in everyday life and did not mention the focus on mindfulness.

Procedure

The participants came to the laboratory, gave informed consent to participate, and filled out various questionnaires. They were equipped with Huawei Ascend G330 Smartphones for a micro-longitudinal experience-sampling phase that started the following day. Participants were instructed how to use the phones to answer the ESM questionnaires. They selected a fixed 12-hour time frame, within which the beeps occurred on each of the nine days of the ESM phase. Participants were then paged in a pseudo-randomized fashion six times a day. As the students were reimbursed according to the number of ESM questionnaires they had completed (totaling 65 Euros on average), they were given the opportunity to prolong the study by up to three days if they had missed more than one assessment per day. If completed in nine days, participants had the opportunity to respond to 54 beeps (which was the number of beeps that we aimed for). If they prolonged the study due to missing beeps, they could answer up to 66 beeps. On average,

participants completed 54.41 ESM beeps ($SD = 3.25$). The number of completed beeps ranged from 48 to 65, which indicates high compliance (i.e., even the least compliant participant answered around 89% of the targeted 54 beeps). Twenty-three participants did not make use of the extra days. Of the 47 participants who did, 16 only answered beeps on the first extra day, 10 used the first or second day, and 21 used up to three extra days to answer beeps.

The applied ESM technology has been developed and successfully applied in previous studies (e.g., Rauers, Blanke, & Riediger, 2013; Riediger, Schmiedek, Wagner, & Lindenberger, 2009). After the ESM phase, the students returned the smartphones and answered additional questionnaires. The ethics committee of the Humboldt-Universität zu Berlin approved of the study. We included all available data from all participants for the statistical analyses.

Measures

At each measurement occasion, participants received the following instructions: *“Please recall the period since the last measurement / since you woke up (on the first beep of the day): How did you behave, what did you think and feel? That is what the following questions are about.”*

State mindfulness

State mindfulness was measured with the Multidimensional State Mindfulness Questionnaire (MSMQ; Blanke & Brose, 2016). The factors present-moment attention, acting with awareness, and nonjudgmental acceptance were measured with three items each. These facets were corroborated in multilevel confirmatory factor analyses in Mplus version 5.2 (Muthén & Muthén, 1998–2011; for details about the procedure, see Blanke & Brose, 2016). Example items are: *“I focused my attention on the present moment”* (present-moment attention), *“I did tasks/things automatically without being aware of what I’m doing”* (acting with awareness, recoded), *“I thought some of my thoughts/feelings were slightly off”* (nonjudgmental acceptance,

recoded). Participants were presented with the items directly after the instruction, and asked to rate the items on a scale ranging from 0 (*does not apply at all*) to 6 (*applies strongly*). On average, participants reported medium endorsement of mindfulness across all measurement occasions (present-moment attention: $M = 3.88$, $SD = 0.66$; acting with awareness: $M = 3.69$, $SD = 0.88$; nonjudgmental acceptance: $M = 4.30$, $SD = 0.93$). Personal means of the facets displayed medium sized correlations with corresponding trait measures from the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) and the Cognitive and Affective Mindfulness Scale Revised (CAMS-R; Feldman et al., 2007). Before further statistical analyses, we removed linear trends from all items using multilevel models with occasions as a level-1 predictor (fixed and random effect). Within-person reliabilities were as follows (based on Cranford et al., 2008): present-moment attention: 0.70; acting with awareness: 0.63; nonjudgmental acceptance: 0.64.

State positive and negative affect

Three items were used to assess PA (happy, relaxed, and content) and NA (nervous, downhearted, and distressed). The items were introduced with the following phrase: *“How have you primarily felt since the last measurement / since waking up (for the first beep of the day): Please rate how well the following emotion adjectives describe your feelings during this time period”*.

The scale again ranged from 0 (*does not apply at all*) to 6 (*applies strongly*). On average, participants reported medium levels of PA ($M = 3.26$, $SD = 0.77$) and lower levels of NA ($M = 1.40$, $SD = 0.90$). The structure of affect was confirmed using multilevel confirmatory factor analyses in Mplus. The model fit was acceptable for a two factor model at both levels of analysis ($\chi^2[30] = 3270.66$, $p < .01$; Comparative Fit Index [CFI] = .95; Root Mean Square Error of Approximation [RMSEA] = .05; Standardized Root Mean Square Residual [SRMR]: $SRMR_{within} = .04$; $SRMR_{between} = .09$).¹ Within-person reliabilities were as follows (based on Cranford et al.,

2008): PA: 0.76; NA: 0.64.

Daily hassles

Participants were asked whether something unpleasant (i.e., a hassle) had happened since the last measurement/ since waking up (at the first beep of the day). Occurrence of hassles was dummy-coded (0 = no occurrence, 1 = occurrence). On average, participants reported 11.70 hassles ($SD = 7.79$) across the study.

Data analysis

As the ESM occasions were clustered within the individuals, we utilized multilevel modeling to account for the dependency. We used the PROC MIXED procedure in SAS (SAS/STAT® software, Version 9.3 of the SAS System for Windows; SAS Institute, 2011) to predict PA and NA separately with all the mindfulness facets as predictors. We included all predictors both as fixed and as random effects and allowed for an unstructured covariance matrix for random intercept and slope effects. A spatial power error structure based on the minutes that had elapsed since the study start was applied, which accounts for the autocorrelation of the unevenly spaced measurement occasions (because more time had elapsed between some measurement occasions than others). We centered the continuous predictors around the individuals' personal means so that regression weights represent deviations from the personal average.

Results

State mindfulness facets and their predictive value for everyday positive and negative affect

In the first two analyses, the different facets of mindfulness were simultaneously entered as predictors of PA and NA (Table 1). All predictors together explained 21% of the explainable variance in PA. Both present-moment attention and nonjudgmental acceptance uniquely predicted

increased PA, whereas the facet acting with awareness had no significant predictive value above and beyond these two facets. In a second step, we determined the variance of PA explained by each facet separately by sequentially removing one facet at a time and comparing the pseudo- R^2 statistics of these nested models (following Singer & Willett, 2003). We did so to substantiate our assumption that present-moment attention is the most relevant predictor of PA among the three facets of mindfulness. As expected, the biggest share of variance was indeed explained by this mindfulness facet, which uniquely explained 6% of the variance in PA; that is, when this facet was removed from the analysis, the explained variance dropped to 15%. The unique contributions of nonjudgmental acceptance and acting with awareness to the variance of PA were 3% and 1%, respectively. We also predicted PA by each facet separately which resulted in the following values of explained variance: present-moment attention: 16%, acting with awareness: 8%, nonjudgmental acceptance: 10%.

Regarding NA, all predictors together explained 25% of the variance. Again, only the facets present-moment attention and nonjudgmental acceptance reached significance, whereas acting with awareness did not. In analogy to the sequence of analyses above, and to substantiate our assumption that nonjudgmental acceptance is the most relevant predictor of NA among the three facets of mindfulness, we again determined their unique predictive variance.

Nonjudgmental acceptance indeed predicted the largest share, 11%, whereas present-moment attention explained 3% of the variance. Acting with awareness uniquely explained only 1% of the variance. For NA, the predictive values of the facets separately were as follows: present-moment attention: 11%, acting with awareness: 6%, nonjudgmental acceptance: 20%. As a side note, the facet acting with awareness reached statistical significance when combined with only one of the other two facets, but did not significantly predict PA or NA above and beyond the other two facets combined. This suggests that acting with awareness does have predictive value, but it is

canceled out by the other two facets.

When testing the effect of present-moment attention on NA in line with predictions of the MAT, we found that present-moment attention was not associated with heightened NA. We nevertheless tested possible interaction effects of these two facets by predicting NA and PA by present-moment attention, nonjudgmental acceptance, as well as their interaction. Regarding NA, we found a significant interaction effect between the facets (estimate = 0.05, $SE = 0.02$, $p < .01$), indicating that during moments that are characterized by high nonjudgmental acceptance, attention loses its importance in possibly reducing NA (see Figure 1). This further underlines the pivotal role of nonjudgmental acceptance for NA. Regarding PA, there was no significant interaction effect (estimate = -0.02 , $SE = 0.02$, $p = .17$); that is, present-moment attention and nonjudgmental acceptance individually predicted PA, but there was no synergetic effect.

In a last step, we applied statistical tests to compare the predictive value of the two significant facets (present-moment attention and nonjudgmental acceptance) regarding PA and NA to corroborate the descriptive comparison of predictive variance. We therefore z-standardized the predictors and repeated the multilevel analysis, using the ESTIMATE statement in SAS PROC MIXED to compare the regression weights of the two predictors (present-moment attention coded as -1 and nonjudgmental acceptance coded as 1). For PA, the difference between the predictors was significant (estimate = -0.07 , $SE = 0.03$, $p = .03$), indicating that, in accordance with our hypothesis, present-moment attention was a significantly stronger predictor for an increase in PA than nonjudgmental acceptance was. The contrast was also significant for NA (estimate = -0.16 , $SE = 0.03$, $p < .01$), indicating that, in accordance with our hypothesis, nonjudgmental acceptance was significantly more predictive of a decrease in NA than present-

moment attention was.

State mindfulness as a buffer for daily hassles

To test for a buffering effect of state mindfulness on affective reactivity to daily hassles, we predicted PA and NA with each mindfulness facet, daily hassles, as well as the respective interactions between mindfulness facet and hassles. We also introduced the affective state at the previous measurement occasion as a predictor to model the change in affect that occurred due to the daily hassle, moving beyond approaches that simply model the co-occurrence of NA and hassles. As such a model already controls for auto-correlation in the data, we did not model the auto-correlative error structure here. Significant results only emerged for nonjudgmental acceptance; these results are depicted in Table 2. We expected nonjudgmental acceptance to buffer the adverse effect of hassles on affective well-being, and this was partly the case: Nonjudgmental acceptance did indeed buffer the effect of daily hassles on decreases in PA. That is, participants who had encountered a hassle and taken a nonjudgmental stance experienced lower decreases in PA in reaction to that hassle than when they were less accepting. A similar pattern was observed regarding NA with nonjudgmental acceptance reducing the increases in NA in reaction to a hassle. This interaction, however, did not reach statistical significance ($p = .05$). The other mindfulness facets did not buffer the effects of hassles on PA (Present-moment Attention x Hassle: estimate = 0.01, $SE = 0.05$, $p = .88$; Acting with Awareness x Hassle: estimate = -0.05, $SE = 0.05$, $p = .36$) or on NA (Present-moment Attention x Hassle: estimate = -0.07, $SE = 0.05$, $p = .14$; Acting with Awareness x Hassle: estimate = -0.01, $SE = 0.04$, $p = .85$).

We followed up on the significant interaction between nonjudgmental acceptance and daily hassles in the prediction of PA. Simple slopes for the mean value as well as one standard deviation above and below the mean are depicted in Figure 2. Reductions in PA following hassles

were smaller the more nonjudgmental acceptance participants reported. The investigation of regions of significance (Preacher, Curran, & Bauer, 2006) showed that, on average, PA was significantly reduced after experiencing hassles. This reduction in PA was smaller the higher nonjudgmental acceptance was. PA reduction associated with hassles ceased to reach statistical significance when nonjudgmental acceptance was high above the personal mean (lower bound of region of significance for nonjudgmental acceptance: 2.69; simple intercept and slope estimates for this value: intercept: 3.69, $SE = 0.10$; slope: -0.27 , $SE = 0.14$, $p = .05$). In other words, in situations where participants were highly accepting, occurrences of daily hassles did not impair their PA levels. Taken together, these results indicate that nonjudgmental acceptance buffers the decrease in PA in reaction to a hassle, with very high levels of nonjudgmental acceptance completely preventing such decreases in PA.

Discussion

To our knowledge, the present study is the first to examine the predictive value of different state mindfulness facets for PA and NA. We not only investigated the direct effect of mindfulness facets on PA and NA, but also examined whether mindfulness has a buffering effect on the impact of daily hassles on PA and NA. ESM had the advantage that we could obtain reports about very recent experiences in contrast to generalized beliefs (Robinson & Clore, 2002). Furthermore, this method permits all research questions to be addressed from a within-person perspective, which allows a more mechanistic view on how mindfulness functions and interacts with affect within individuals across time. In this respect our approach differs from most prior research on similar topics that focused on between-person associations between mindfulness and other variables. Among the three mindfulness facets assessed, we found present-moment attention to be most strongly related to positive affectivity, and nonjudgmental acceptance to be most strongly related to negative affectivity. Nonjudgmental acceptance also moderated the

adverse effects of daily hassles on affective well-being.

The different predictive value of state mindfulness facets

Based on theoretical considerations and empirical evidence at the trait level of mindfulness facets (e.g., Cameron & Fredrickson, 2015; Kohls et al., 2009; Schroevers & Brandsma, 2010), we assumed that state present-moment attention is especially predictive of state PA, whereas nonjudgmental acceptance is most strongly predictive of state NA. These hypotheses were supported: Whereas present-moment attention explained the biggest share of unique variance in PA (7%), nonjudgmental acceptance predicted the biggest share of unique variance in NA (12%) as compared to the other two facets. Acting with awareness did not reach statistical significance above and beyond the other two facets.

These results imply that these facets may be differentially implemented to achieve emotion-regulation goals: Whereas a focus on the present moment may be more useful in upregulating or maintaining PA, a nonjudgmental stance may be more useful in downregulating NA or in preventing affective well-being from being impacted by stressful events. Garland and colleagues (2015) proposed that state mindfulness and broadening awareness in the present moment lead to positive reappraisal and thus to positive emotionality and stress reduction. Attention to the present moment may thus help individuals to see the positive side of situations and to appreciate even mundane experiences and duties (Hanley et al., 2015). In contrast, the value of nonjudgmental acceptance seems to be especially apparent in negative situations or times of stress. For example, nonjudgmental acceptance has been related to decreased levels of distress, potentially because accepting negative experiences is associated with less rumination (e.g., Coffey, Hartman, & Fredrickson, 2010). We also tested predictions made by the MAT (Lindsay & Creswell, 2017), which states that attention without acceptance is likely to foster positive and negative affectivity alike. While it seems reasonable to assume that monitoring own

emotional states leads to an amplification of such states, we could only confirm such heightened affectivity for PA, not for NA. We assume that this may be partly due to different conceptualizations of monitoring on the one hand and present-moment attention on the other. Findings reported by Lindsay and Creswell (2017) are mainly based on the “observe” facet as measured in the FFMQ (Baer et al., 2006). This facet features attention to specific bodily experiences as well as attention to emotional content, and does not load on a common mindfulness factor in samples without meditation experience (Bear et al., 2006). In our study, we used the present-moment attention facet of the MSMQ (Blanke & Brose, 2016), in which attention to the present-moment is assessed more broadly (e.g., focusing on the present moment) and in association with nonjudgmental acceptance (i.e., both facets load on a common mindfulness factor). We therefore think that present-moment attention as assessed here represents mindful attention that may differ from attention in the sense of monitoring, at least in non-meditating samples.

Acting with awareness was not predictive of either PA or NA in daily life above and beyond the other facets. The Mindful Attention and Awareness Scale (Brown & Ryan, 2003), on which our three-item measure of acting with awareness is based, was described as including elements of a lack of attention as well as an indirectly assessed critical stance towards the self (Bergomi et al., 2013). Thus, this facet seems to be less specific than the other two, which may help to explain its low unique predictive value above and beyond the other facets. In line with Bergomi et al. (2013), our findings therefore suggest that investigating state mindfulness using the facet acting with awareness alone may not be as specific as applying a multidimensional measure. However, the facets’ predictive value likely depends on the outcomes in question as well as on the time frame of assessment: For example, in the study by Eisenlohr-Moul, Peters, Pond, and DeWall (2016) both nonjudgment and acting with awareness as assessed with a daily

diary predicted daily anger.

The buffering effect of nonjudgmental acceptance on the impact of daily hassles

We assumed that mindfulness facets buffer the effect of daily hassles on affect, especially nonjudgmental acceptance, which seems to be the facet most relevant when mastering difficult situations. Indeed, we found that nonjudgmental acceptance (but not the other facets) buffers the adverse effects of daily hassles on PA. The buffering effect was marginally significant for NA. This finding is important for two reasons. First, the fact that the buffering effect was only significant for PA seems to suggest that mindfulness, and particularly nonjudgmental acceptance, is a state of mind that helps maintain poise in the face of stressors. Second, and more generally, our analytical approach (i.e., the investigation of associations at the within-person level) reveals how within-person change in affect can be reversed to some degree by a particular state of being. Our approach can thus tap into individual psychological processes as they are unfolding—in this particular case it reveals how mindfulness benefits individuals across time and in daily life. Our insights extend previous findings on the role of mindfulness in the context of stress because of the respective studies' between-person perspective. They were thus limited to the insight that people with higher levels of mindfulness on average experience less distress when they face hassles—and such studies cannot pinpoint the mechanisms behind the associations.

Taken together with the results from the first set of analyses, we conclude that nonjudgmental acceptance is most relevant in negatively valenced situations (i.e., when current mood is negative or when hassles occur). It is of note that reactivity to stressful events seems to be only one mechanism by which mindfulness influences PA and NA. Another proposed mechanism is, for example, the broadening of awareness for the positive and the application of

positive reappraisal (e.g., Garland, Gaylord, & Fredrickson, 2011).

Limitations and future directions

We measured experiences during the time frame since the last beep (or since participants got up in the morning), thus not referring to states in the narrow sense. Therefore, retrospective biases cannot be completely ruled out. We chose this time frame in accordance to the idea of mindfulness as a mode of being (as described by Bishop et al., 2004). Whereas a mindful mode may span longer time frames such as hours, experiences within such time frames might be more momentary indeed, such as engaging in a judgmental thought or being attentive to an experience. With the MSMQ, we aimed to find the most fine-grained, yet appropriate time scale to capture mindful modes.

Relatedly, we lack knowledge about the exact temporal order of our results. We assumed that participants who approached daily hassles with a more nonjudgmental stance reacted less strongly to these hassles, resulting in reduced decreases in PA. Although a previous study indicates that daily mindfulness precedes changes in affect in daily life (Snippe et al., 2015), it is possible, for example, that individuals initially reacted quite strongly to a hassle, but then adopted a nonjudgmental stance, which improved their overall PA for this time frame. Our statistical control of affect at the previous time point in the context of the moderation analyses, however, means that we analyzed the effect of mindfulness on change in affect that occurred in the direct context of stressors. Thus, the temporal order is considered in this analysis.

Despite our multidimensional approach, we may still not have captured all mindfulness facets that are relevant in daily life and for affective experiences (see, e.g., Bergomi et al., 2013). An interesting facet in this regard could, for example, be curiosity—a facet that is rooted in the present moment and was found to be related to state positive affectivity during such a mundane tasks as dish-washing after a short mindfulness intervention (Hanley et al., 2015). Furthermore,

depressed individuals, who are known to profit from mindfulness interventions, might especially benefit from the facet of taking a decentered perspective because it helps them to distance themselves from their negative thoughts and feelings rather than ruminating on them (e.g., Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Thus, although we have gained new insights into the differentiated way in which mindfulness operates within individuals, there is likely more to discover. As different mindfulness facets respond differentially to mindfulness training (Carmody & Baer, 2008), it may be possible to design short interventions for everyday life that target one of the facets specifically. A first step in this direction was taken by Huffziger and colleagues (2013) who showed that (unspecific) short mindfulness inductions in daily life via ESM technology can increase the level of calmness in individuals. Relatedly, a mindfulness app was successfully applied to enhance participants' PA (Howells, Ivtzan, & Eiroa-Orosa, 2016). Based on the findings of this study, it could thus be a goal of future interventions to foster positive affectivity in healthy participants by reminding them to direct their attention to the present moment. Likewise, interventions aiming to decrease NA may need to strengthen nonjudgmental acceptance in particular. However, in accordance with Lindsay and Creswell (2017) it seems important to foster a mindful way of attending to one's present-moment experiences as to prevent people from engaging in their negative affectivity or from craving positive emotional experiences.

Conclusion

With the present research, we contribute to a better understanding of how mindfulness influences everyday experiences. We found empirical support for the hypothesis that mindfulness facets differentially contribute to aspects of well-being: Whereas present-moment attention most strongly predicted PA, nonjudgmental acceptance was most strongly associated with NA. Furthermore, only nonjudgmental acceptance buffered the adverse effect of daily hassles on

affect. We believe that these findings have two major implications. First, this study demonstrates that a multidimensional rather than a unidimensional conceptualization of mindfulness at the level of daily experiences leads to a more precise understanding of the mechanisms by which mindfulness improves people's well-being. Second, and as a consequence of the preceding, our findings suggest that short mindfulness interventions could be designed to target specific aspects of mindfulness to achieve different emotional goals (e.g., the increase of positive emotions in non-distressed individuals; the decrease of negative emotions in distressed individuals). To conclude, whereas the importance of differentiating PA and NA as two aspects of affective well-being has been commonly acknowledged, this study reveals potential pathways to PA and NA by taking a multidimensional perspective on state mindfulness.

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Footnotes

¹ The residual variance of the item “happy” was fixed to zero on the between-person level in this model (as it was negative in a subsequent model that estimated all residual variances). This indicates that “happy” is a nearly perfect indicator for the factor PA.

Table 1

Prediction of Positive and Negative State Affect by Three Mindfulness Facets (N = 70, M = 54.41 measurement occasions per person)

Predictors	Positive affect (PA)				Negative affect (NA)			
	<i>Estimate</i>	<i>SE</i>	<i>95% CI</i>	<i>Unique predictive variance</i>	<i>Estimate</i>	<i>SE</i>	<i>95% CI</i>	<i>Unique predictive variance</i>
<i>Fixed effects</i>								
Intercept	3.26**	0.09	[3.07, 3.44]		1.40**	0.11	[1.19, 1.62]	
Attention	0.27**	0.03	[0.22, 0.32]	6%	-0.12**	0.02	[-0.16, -0.07]	3%
Awareness	0.03	0.02	[-0.02, 0.07]	1%	0.00	0.02	[-0.04, 0.03]	1%
Nonjudgment	0.17**	0.02	[0.13, 0.21]	3%	-0.26**	0.02	[-0.30, -0.23]	11%
<i>Random effects</i>								
Intercept	0.56 ¹	0.10			0.80 ¹	0.14		
Attention	0.02 ¹	0.01			0.02 ¹	0.01		
Awareness	0.02 ¹	0.01			0.01 ¹	0.00		
Nonjudgment	0.01 ¹	0.01			0.01 ¹	0.00		
Auto-correlation	0.99	0.00			0.99	0.00		
Residual	0.85	0.02			0.64	0.02		
Pseudo-R ²			0.21				0.24	

Notes. Attention = Present-moment attention, Awareness = Acting with awareness, Nonjudgment = Nonjudgmental acceptance. The unique predictive variance of each facet is determined by removing the respective predictor from the model and a subsequent comparison of the pseudo-R² statistic. ** *p* < .01.

¹Random effect exceeds the .01 critical χ^2 value obtained by the deviance statistic (see Singer & Willett, 2003), indicating that the random effect should not be restricted to zero.

Table 2

Moderation of Affective Reactivity Following a Hassle by Nonjudgmental Acceptance (N = 70)

Predictors	Positive affect (PA)			Negative affect (NA)		
	<i>Estimate</i>	<i>SE</i>	<i>95% CI</i>	<i>Estimate</i>	<i>SE</i>	<i>95% CI</i>
<i>Fixed effects</i>						
Intercept	3.41**	0.09	[3.23, 3.59]	1.25**	0.11	[1.04, 1.46]
Affect at <i>t-1</i>	0.27**	0.02	[0.23, 0.32]	0.25**	0.02	[0.20, 0.29]
Nonjudgment	0.11**	0.02	[0.06, 0.15]	-0.19**	0.02	[-0.24, -0.14]
Hassle	-0.64**	0.07	[-0.77, -0.51]	0.59**	0.06	[0.48, 0.71]
Nonjudgment x Hassle	0.14**	0.04	[0.06, 0.22]	-0.08 [†]	0.04	[-0.17, 0.00]
<i>Random effects</i>						
Intercept	0.55 ¹	0.10		0.76 ¹	0.13	
Affect at <i>t-1</i>	0.02 ¹	0.00		0.02 ¹	0.01	
Nonjudgment	0.01 ¹	0.01		0.02 ¹	0.01	
Hassle	0.15 ¹	0.05		0.12 ¹	0.04	
Nonjudgment x Hassle	0.03 ²	0.02		0.05 ¹	0.02	
Residual	0.73	0.02		0.49	0.01	
Pseudo-R ²		0.32			0.42	

Notes. Nonjudgment = Nonjudgmental acceptance. ** $p < .01$. [†] $p < .10$.

¹Random effect exceeds the .01 critical χ^2 value obtained by the deviance statistic (see Singer & Willett, 2003), indicating that the random effects should not be restricted to zero.

²Random effect does *not* exceed the .01 critical χ^2 value obtained by the deviance statistic (see Singer & Willett, 2003), indicating that the random effect could be restricted to zero.

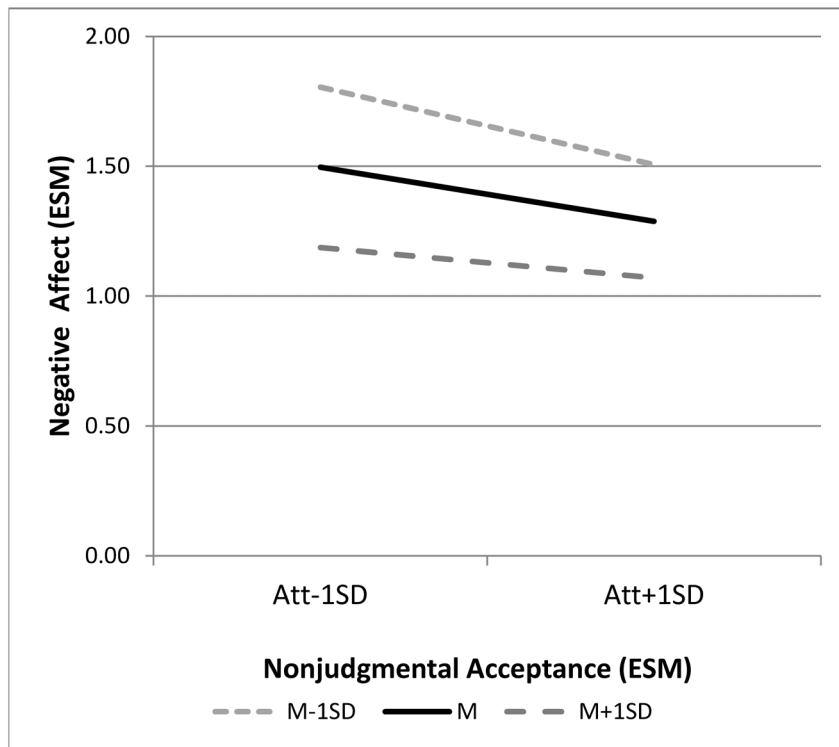


Figure 1. Simple slopes of the prediction of negative affect by the mindfulness facets present-moment attention, nonjudgmental acceptance, and their interaction as assessed using experience-sampling methodology (ESM). Att M-1 SD and Att M+1 SD refer to values of present-moment attention one standard deviation below and above the mean. M-1 SD, M, and M + 1 SD refer to the mean nonjudgmental acceptance in the sample, as well as values one standard deviation below and above the mean.

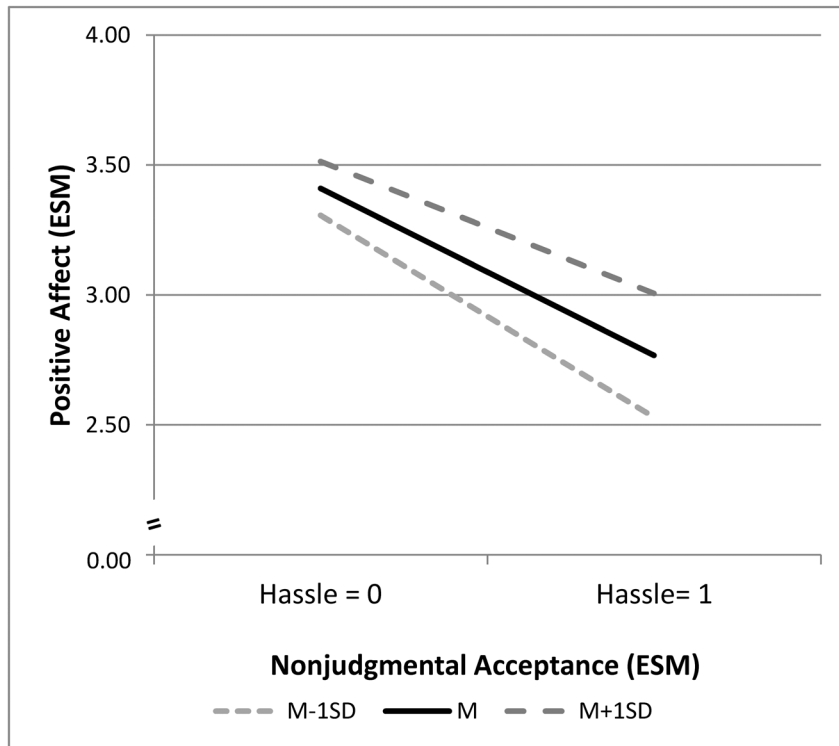


Figure 2. Simple slopes of the prediction of positive affect by the mindfulness facet nonjudgmental acceptance as assessed using experience-sampling methodology (ESM). The model controls for positive affect on a previous beep. “Hassle = 0” refers to occasions in which no hassle had occurred, “Hassle = 1” refers to occasions in which a hassle had occurred. $M - 1 SD$, M , and $M + 1 SD$ refer to the mean nonjudgmental acceptance in the sample, as well as values one standard deviation below and above the mean.