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Being present in the moment: Event-level relationships between mindfulness and stress, positivity, and importance

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ABSTRACT

Each day for two weeks, participants (psychologically healthy adults residing in the community) described the events that happened to them. These descriptions included how attentive to the present moment they were during the event, and how stressful, positive, and important the event was. Three-level MLM analyses (events nested within days, days nested within persons) found that dispositional (trait) mindfulness was positively related to event-level mindfulness (presence), positivity, and importance, and was negatively related to event-level stress. At the event-level, presence was positively related to how positive and important events were and was positively related to how stressful events were. Moreover, these event-level relationships did not vary as a function of trait mindfulness. These results suggest that although more mindful people may experience less stress, when stress occurs, people tend to become more mindful.

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1. Introduction

Although definitions of mindfulness vary, there is broad agreement that mindfulness is an attentional style (or way of paying attention) that originated in contemplative traditions such as Buddhism. One of the most commonly cited definitions of mindfulness describes it as “paying attention in particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994, p. 4). Similarly, other definitions emphasize that mindfulness involves maintaining awareness to the present moment (Brown & Ryan, 2003). Although major conceptualizations of mindfulness (e.g., Bishop et al., 2004; Shapiro, Carlson, Austin, & Freedman, 2006) include other components than attention, such as awareness, intention, and/or acceptance, most definitions of mindfulness involve sustained consciousness/awareness of external events and internal experiences as they occur (Jankowski & Holas, 2014).

The primary focus of the present study was the relationship between mindfulness and stress. A considerable body of research has found that mindfulness is negatively related to stress at the trait level. More mindful people experience less stress (e.g., Nyklíček & Kuijpers, 2008), and they react to stress more adaptively than the less mindful (e.g., Bränström, Kvillemo, Brandberg, & Moskowitz, 2010). Similarly,

mindfulness and stress have been found to be negatively related at the within-person level. For example, in an experience sampling study, Weinstein, Brown, and Ryan (2009) found that daily mindfulness was negatively related to daily stress.

Nevertheless, despite the growing body of research on mindfulness and the fact that definitions of mindfulness emphasize “being in the moment” (what we refer to as *presence*), we know of no study that has examined people’s presence during everyday events. To address this issue, we conducted a study in which participants described the events they experienced each day, including their attention to the present moment. We also measured trait-level mindfulness. Together, these data allowed us to examine how mindfulness, conceptualized in terms of basic awareness of present moment, varied at both the state (event) and trait (dispositional) levels.

1.1. Mindfulness as a disposition

Research on mindfulness has its roots in clinical psychology, and within this context, increasing mindfulness is seen as a means to increase well-being, and the existing research supports such a conclusion. Mindfulness training has been found to have a variety of positive effects, including increased well-being, reduced psychopathology and emotional reactivity, and improved behavioral regulation (e.g., Khoury et al., 2013). Consistent with these results, naturally occurring differences in mindfulness have been found to be positively related to measures of well-being such as life satisfaction and self-esteem (e.g., Brown &

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Ryan, 2003). Complementing this, research has found negative relationships between mindfulness and measures of distress (e.g., Brown & Ryan, 2003; Cash & Whittingham, 2010). It appears that greater dispositional mindfulness is associated with increased well-being and better mental health.

1.2. Mindfulness as a state

By definition, mindfulness is a state – an individual's orientation to what he or she is experiencing at a specific time, and dispositional mindfulness can be defined in terms of the average mindfulness a person experiences. Although it may be useful to think of dispositions as aggregates of states, few psychological constructs are fixed across time and situations. In fact, variability may be more the norm than it is the exception, and such an assumption underlies research that is often referred to as “experience sampling.” In such studies participants provide responses each day or multiple times a day, and analyses focus on within-person variability in constructs that traditionally might have been considered to be stable traits such as the Big Five (e.g., Fleeson, 2001).

Such within-person relationships concerning mindfulness have been examined previously. For example, Brown and Ryan (2003) collected measures of state mindfulness, autonomy, and emotional states multiple times a day for 21 days. They found that state mindfulness covaried with state feelings of autonomy and of affect. In a laboratory study, Weinstein et al. (2009) found that trait mindfulness was negatively related to state-level perceptions of stress, and in a diary study they found that daily mindfulness and stress were negatively related.

Despite the large body of research on mindfulness and stress, we know of no study that has examined relationships between how mindful people are at a moment in time and how stressed they feel at that same moment. The bulk of research on stress and mindfulness has concerned person-level relationships, and studies of state-level relationships have not examined stress-mindfulness relationships at the moment- or event-level. Knowing that mindfulness and stress are negatively related at the person-level or the day-level, tells us nothing about relationships at the moment- or event-level (e.g., when people are stressed are they less mindful). Relationships at different levels of analysis may represent psychological different processes (Affleck, Zautra, Tennen, & Armeli, 1999), and relationships between the same variables at different levels of analysis are mathematically independent (Nezlek, 2012).

1.3. The present study

The present study examined relationships between stress and mindfulness at what we will call the event-level, a specific point in time. We defined mindfulness in terms of attention to the present moment (*presence*). Participants described the events they experienced each day, and these descriptions included how present they thought they were during the event, and how stressful, positive, and important the event was. Our primary interest was the relationship between stress and *presence*. We collected measures of positivity and importance primarily to control the stress–mindfulness relationships we examined for relationships between stress and positivity and for relationships between stress and importance, although we had secondary hypotheses about positivity and importance. Participants also completed the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), a trait level measure of mindfulness. Our study was guided by the following hypotheses.

1.3.1. Event-level mean presence, positivity, and importance will be positively related to trait mindfulness, whereas event-level mean stress will be negatively related to trait mindfulness

Our event-level measure of presence was meant to assess a core element of dispositional mindfulness, and so we expected that event and

dispositional mindfulness would be positively related. Our expectations that mean event-level positivity would be positively related to trait mindfulness and that mean event-level stress would be negatively related to trait mindfulness are straightforward extension of the existing research. Although importance has not been discussed in research on mindfulness, we expected there would be a positive relationship between mean importance and trait mindfulness. Part of being mindful is being attentive to one's surroundings, to what is going on in the “here and now.” Mindful people recognize the importance of living in the moment, and this should translate into a greater recognition that what is happening here and now is important. Although these hypotheses involve event-level measures, they concern relationships at the person-level. The means these hypotheses concern are calculated across all the events, and as such they become person-level measures.

1.3.2. At the event-level, we expected that presence would be negatively related to stress and would be positively related to importance and positivity

Studies at the person- and day-levels have found that mindfulness and stress are negatively related, which led us to assume the same relationship would exist at the event-level. Nevertheless, stress is a negative stimulus, and more stressful events might demand more attention than less stressful events (see Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). In light of this, we also entertained the possibility that presence and stress would be positively related. We expected that attention to the present moment and positivity would be positively related at the event-level based on existing research such as the moment-level relationships reported by Brown and Ryan (2003). We expected that importance and presence would be positively related at the event-level because mindfulness includes recognition of the importance of the here and now.

2. Method

2.1. Participants

The sample consisted of 153 community members, native Poles living in or near Warsaw, who responded to a call posted on two popular internet sites for participants in a “study about everyday functioning.” Inclusion criteria included being free from current or past history of psychiatric disorders, and participants were screened for psychiatric problems based on the Mini International Neuropsychiatric Interview (Sheehan et al., 1998). As a result, 22 participants were excluded from the analyses because they reported symptoms consistent with a diagnosis of a disorder, leaving a final sample of 131. For these 131 participants, mean age was 36.9 ($SD = 14.1$, range 16–71), and 88 were women. Sixty-seven had a college degree, 44 had only a high school degree, 14 had some college, 3 had only a primary school degree, and 3 did not describe their education. Participants were paid approximately 55 USD.

2.2. Procedure and measures

At introductory sessions, participants were told about the study and how to use the website, and they completed the MAAS (Brown & Ryan, 2003). MAAS scores were defined as the mean response to the items ($M = 4.21$, $SD = .73$, $\alpha = .88$), and higher scores represented greater mindfulness.

Following this meeting, at the end of each day for two weeks, participants logged onto a secure website. In the instructions, we emphasized that we were interested in non-trivial events, and so participants were asked to “recall all the important events that happened today.” Events could be positive or negative, and participants indicated the nature of the event by selecting one of ten categories: interpersonal, family, partnership/marriage, health and physical symptoms, hobby, morals/values dilemmas, work/duties, contacts with officials, financial issues, and everyday life. Examples of positive and negative events were provided for each category.

Participants rated each event in terms of presence (mindfulness), stressfulness, positivity, and importance, using a 7-point response scale anchored with 1 = *not at all* and 7 = *very much*. We assumed that importance, stressfulness, and positivity were terms that would be readily understood, and we provided no detailed definitions for these items. We simply asked “how stressful, important, and positive was this event for you?”

In an attempt to make certain that participants thought of presence similarly, based on Brown and Ryan (2003), we provided a definition of presence – attention to what is taking place in the present moment. We told participants to “Indicate how present you were during the event, how much you felt you concentrated on the event and did not think about other things during that time. If during the event your mind wandered to different things that would indicate that you were not present.” For each event, a new screen and set of responses appeared, and participants could describe as many events each day as they wanted. Participants also provided other measures at the day-level, but because our analyses focused on the event-level, we do not consider these day-level measures in this paper.

2.3. Compliance with instructions

Before analyzing the data, we inspected the date and time stamps of participants' entries. To be considered valid, an entry needed to have been made after 8:00 pm of the day in question or before noon of the following day. Entries provided outside of these limits were deleted. Following these guidelines, we deleted 43 entries, leaving 1695 days of valid data ($M = 12.94, SD = 2.64, \text{range } 6\text{--}15$), and 14,768 events ($M = 8.65$ per day, between-person $SD = 2.21$, within-person $SD = 1.27$). It is important to note that our analyses took into account between-person differences in days retained for analysis, and between- and within-person differences in number of events.

3. Results

The data were conceptualized as a multilevel model with three levels: events nested within days and days nested within persons (Nezlek, 2012). The “totally unconditional” model is presented below. This model estimated the mean response and estimated the variance for each level of analysis. These analyses are summarized in Table 1.

Event – level (level 1) $y_{ijk} = \pi_{0jk} + e_{ijk}$

Day – level (level 2) $\pi_{0jk} = \beta_{00k} + r_{0jk}$

Person – level (level 3) $\beta_{00k} = \gamma_{000} + u_{00k}$

These analyses indicated that:

1. Most of the variance of the measures was at the event-level and relatively little was at the day-level. Responses about events reflected reactions to individual events more than whether participants had a bad or good day overall.
2. Although the event-level variance for the ratings was substantial, events tended to be positive and important. Mean stress was below the midpoint of the scale, and mean presence was high.

Table 1
Descriptive statistics for event level measures.

	Mean	Variance		
		Event	Day	Person
Presence	5.01	1.56	.10	.43
Positive	4.29	3.63	.20	.34
Stress	2.72	2.76	.22	.56
Importance	5.14	1.46	.09	.30

3.1. Event measures and trait mindfulness

Next, we examined relationships between trait levels of mindfulness and ratings of events by adding MAAS scores to the person-level model presented above. In support of our conceptualization of presence as a state-level measure of mindfulness, we found that trait MAAS scores were positively related to mean ratings of presence in events ($\gamma_{001} = .28, t = 3.94, p < .001$). Consistent with the results of previous research, trait MAAS scores were positively related to mean ratings of the positivity of events ($\gamma_{001} = .24, t = 3.39, p = .001$) and were negatively related to mean ratings of how stressful events were ($\gamma_{001} = -.19, t = 2.08, p < .05$). Trait MAAS scores were also positively related to how important events were ($\gamma_{001} = .13, t = 2.12, p < .05$).

3.2. Event-level relationships between presence and other ratings of events

To examine how event-level presence covaried with other event-level characteristics we modeled presence as a function of positivity, stress, and importance. These variables were entered group-mean centered, which meant that the analyses controlled for both between-person and between-day differences in ratings. In essence, a set of regression coefficients was estimated for each day for each person, and the means of these coefficients were tested for significance at the person-level: Were the mean slopes (relationships between presence and the three predictors) different from 0? All slopes were modeled as randomly varying. The model is below.

$$\text{Event level } y_{ijk} = \pi_{0jk} + \pi_{1jk} (\text{positive}) + \pi_{2jk} (\text{stress}) + \pi_{3jk} (\text{importance}) + e_{ijk}$$

The results of these analyses were straightforward. Presence was significantly and positively related to positivity ($\gamma_{100} = .15, t = 17.6, p < .001$), stress ($\gamma_{200} = .21, t = 16.6, p < .001$), and importance ($\gamma_{300} = .44, t = 27.8, p < .001$). Follow-up tests (Nezlek, 2012) indicated that each coefficient was significantly different from all other coefficients (all $ps < .0001$). Also, the relative magnitudes of these coefficients did not change appreciably when they were analyzed separately (positivity, .13; stress, .16; importance, .55). This similarity suggested that coefficients estimated when all predictors were included were not the result of some type of suppression or enhancement. We should also note that positivity and stress were negatively related ($\gamma_{100} = -.63, t = 32.6, p < .001$), positivity and importance were positively related ($\gamma_{100} = .41, t = 14.7, p < .001$), and that stress and importance were positively related ($\gamma_{100} = .22, t = 8.11, p < .001$).

We also examined individual differences in these slopes as a function of trait-level mindfulness by including MAAS scores as a predictor in the person-level model. These analyses did not suggest that these slopes varied as a function of trait mindfulness, all $ps > .12$.

3.3. Analyses of event type

Existing research on mindfulness has not considered the possibility that mindfulness varies as a function of the situations in which people find themselves. To examine such a possibility, we conducted analyses that took into account the nature of the events people experienced. Given the lack of research and theorizing on this topic we examined such possibilities on an exploratory basis. To reduce the 10 categories participants used to classify events to a more manageable number, we combined some categories. Interpersonal, family, partnership/marriage events were combined into a category labeled *social* (32% of total), and work/duties, contacts with officials, and financial events were combined into a category labeled *work* (25%). Health and physical symptoms (10%), hobbies/relaxation (15%), moral dilemmas (5%), and everyday life events (13%) remained separate categories.

We conducted analyses that estimated the mean presence for each event type and examined relationships between MAAS scores and

these means. These were three-level models in which presence was the outcome, and each event type was represented by a dummy-coded variable. The intercept was dropped from the model, and predictors were entered uncentered. Such no-intercept models can be used to estimate means for non-overlapping categories (Nezlek, 2012). The resulting coefficients represented the mean presence for each event type. The event-level model is presented below.

$$Y_{ijk} = \pi_{1jk} (\text{social}) + \pi_{2jk} (\text{work}) + \pi_{3jk} (\text{health}) + \pi_{4jk} (\text{relax}) \\ + \pi_{5jk} (\text{morals}) + \pi_{6jk} (\text{daily}) + e_{ijk}$$

The estimated mean presence for each event type and the coefficients describing the relationships between MAAS scores and these means are presented in Table 2. Paired comparisons found that all pairs of means were significantly different at $p < .01$ (and beyond) except for the pairs of social events vs. moral/value events (*ns*) and health-related vs. everyday events ($p = .06$). Relationships between mean presence and MAAS scores were positive and significant ($p < .01$ or beyond) for all event types, except for moral ($p = .08$). Moreover, paired comparisons found that MAAS coefficients for no pair differed significantly (all $ps > .20$). Taken together, these results suggest that although state mindfulness (presence) may vary as a function of situational circumstances, relationships between presence and trait mindfulness do not.

Table 2
Mean presence and relationship with trait mindfulness as a function of event type.

	Social	Work	Health	Relax	Moral	Everyday
Mean presence	5.32	5.03	4.55	4.87	5.30	4.69
MAAS coefficient	.26**	.28**	.25*	.33***	.21 ^a	.26**

Note.

- ^a $p < .10$.
- * $p < .05$.
- ** $p < .01$.
- *** $p < .001$.

These analyses also controlled for the possibility that relationships between trait mindfulness and event-level means were confounded by individual differences in the distributions of event types. For example, mindfulness was greater for social events. Therefore, individuals who had more social events might be more mindful (were higher in mean presence) than those who had fewer social events because of differences in their everyday events. The similarity of MAAS–presence relationships across event types suggested that this was not the case.

4. Discussion

Our results confirmed our primary hypotheses. Dispositional levels of mindfulness were positively related to how positive and important people found daily events to be and how attentive to the present moment people were during daily events, and dispositional mindfulness was negatively related to how stressful these events were. Although event-level presence varied across types of events, relationships between trait- and event-level mindfulness did not. At the event-level, being present was positively related to the importance, positivity, and stress of events.

4.1. Event-level relationship between presence and positivity, importance, and stress

Consistent with previous research at other levels of analysis, we found that presence was positively related to how positive events were. We also found that presence was higher during more important events than during less important events, and importance was clearly the strongest predictor of presence among our three predictors. The

coefficient for importance (.44) was three times the size of the coefficient for positivity (.15) and twice the size of the coefficient for stress (.22). Although previous research has not examined importance *per se*, such a positive relationship is consistent with most conceptualizations of mindfulness. To be mindful is to be aware of one's surroundings, to recognize what is going on, to be "in the moment." Our data did not provide a basis to examine casual relationships, and we address questions of causality in the next section.

Perhaps the most interesting result of our study was the positive event-level relationship between presence and stress. First, such a positive relationship is the opposite of what has been found in previous studies, all of which have used levels of analysis other than the event. Regardless, it is unlikely that the present relationship was spurious. Presence was positively related to trait mindfulness and stress was negatively related, person-level relationships that are consistent with previous person-level results, and at the event-level, stress was negatively related to positivity.

These results suggest that the positive event-level relationship between presence and stress was not due to some type of response bias. Moreover, the fact that the zero-order relationships between presence and the three predictors were very similar to the relationships when all three were included in the same model, strongly suggests that the presence–stress relationship could not be accounted for by some type of enhancement/suppression processes. Although relationships at different levels of analysis are independent, given the large body of research indicating how increasing mindfulness can reduce stress, it seems unlikely that increases in presence led to increases in stress. Rather, it seems more likely that increased stress led to increased presence.

4.2. Can mindfulness be elicited by external circumstances?

The dominant emphasis in the study of mindfulness has been on mindfulness as an ability or a skill that people possess to varying degrees, and a foundational premise of mindfulness based therapies is that people can be taught to be more mindful. Moreover, the extent to which people are mindful has largely been considered to be under the control of the person. In fact, self-regulation has been described as a core feature of mindfulness (e.g., Hart, Ivrtzan, & Hart, 2013).

Nevertheless, mindfulness might be elicited (or dampened) by situational variables. For example, in the present study, people reported being very present in situations that involved moral issues (understandably), and they reported being the least present in situations that involved their health. This latter result could have implications for how people follow and react to instructions from their doctors, similar to the results of studies on autonomy (e.g., Ng et al., 2012). Although experienced meditators might be able to be mindful under any circumstances, for non-experts, the vast majority of people, situational factors may be important influences on how mindful they are.

The situational characteristics we measured may have been elicitors of mindfulness, at least as defined in terms of attention to the present moment. Importance is almost a proxy for how much people are paying attention to something. Unimportant matters do not require attention. Important matters do. Stress may represent dangers or threats, and considerable research indicates that negative stimuli receive more attention than positive stimuli (e.g., Baumeister et al., 2001). Admittedly, attention is a necessary, but not sufficient condition for mindfulness. Events vary in terms of how much they demand our attention, and by extension, events may vary in their *potential* for mindfulness. We did not find that dispositional mindfulness moderated relationships between event characteristics and event mindfulness, suggesting that event characteristics are proximal and important influences on how mindful people are at any given moment.

It is important to note that such possibilities are not incompatible with considering mindfulness as a skill that can be taught. Recall that the naturally occurring differences in trait mindfulness in our sample

were negatively related to mean stress. Our results suggest that mindfulness can be influenced by situational factors, and understanding such possibilities will require further research.

4.3. Event-level presence as a measure of event-level mindfulness

We measured attention to the present moment using a single item referring to presence for practical and theoretical reasons. Although most measures of psychological constructs consist of multiple items, single item measures can be reliable and valid (e.g., Robins, Hendin, & Trzesniewski, 2001). We used one item because we knew that participants would be describing numerous events each day, and all questions would need to be answered for each event. We were concerned that if participants made too many ratings of each event that the precision of each response for each event would be diminished. Previous research has found that as the number of responses per occasion of measurement increases, the correlations between individual measures increase (Nezlek, 2012), suggesting a reduction in discriminant validity for each measure, and so we limited our event-level measures to single items.

We measured mindfulness in terms of presence because we thought that given the limitation of one item, presence best represented mindfulness. For example, Brown and Ryan (2003) noted: “The MAAS is focused on the presence or absence of attention to and awareness of what is occurring in the present” (p. 824). Nevertheless, a different measure of state mindfulness might have led to different results. For example, Hart et al. (2013) suggested that mindfulness has been defined in two ways, one emphasizing the type of awareness of the present we relied upon, and another, identified with Langer (1989), emphasizing creativity and openness to new ideas. Also, we did not measure acceptance of the present-moment experience that has been suggested as a component of mindfulness (e.g., Bishop et al., 2004). We made this decision based on the results of Brown and Ryan (2004) who found no additional convergent, discriminant, or criterion validity for a second acceptance factor, leading them to conclude that present focused attention subsumed acceptance. Nevertheless, acceptance might play a role in event-level processes.

4.4. Limitations and conclusions

To our knowledge, this is the first study to examine relationships between presence (a core element of mindfulness) and stress at the event- or momentary-level, and demonstrating that naturally-occurring presence varies as a function of situational characteristics should further our understanding of mindfulness. Of course, the present study has limitations. We focused on an aspect of mindfulness; other measures based on other conceptualizations may have led to different conclusions. In addition, participants' reports of presence were retrospective; reports taken at the moment might have led to different results. We also did not control for participants' experience meditating or their knowledge of mindfulness. Although we have no reason to believe many participants had such experience or knowledge, it is possible that some did. Nevertheless, we believe that the present study makes a meaningful contribution to our understanding of mindfulness by showing that relationships between mindfulness and other states may vary across different levels of analysis.

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