Mindfulness in everyday life: between- and within-person relationships to motivational conflicts

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Abstract
Mindfulness has shown beneficial relationships with well-being and self-regulation. We aim to improve the understanding of the effects of between- and within-person differences in mindfulness when dealing with situations of motivational conflict. For this purpose, we conducted an experience sampling study with 56 university students who replied to a total of $N = 1889$ short questionnaires, which they received via their smartphones over a period of eight consecutive days. In addition to a state mindfulness questionnaire with the facets presence and non-judgment (focusing attention on the experience of the current action and a momentary non-judgmental stance towards these, respectively), the participants received questions about their current affective well-being and perceived intensity of want or should conflict experiences. Multi-level analyses revealed that want conflicts were predicted by both state mindfulness facets, even after momentary affect was controlled. In addition, to be non-judgmental (as a trait), and having momentary presence (as a state), related to lower intensity of should conflicts. The results suggest that being mindful might be a particularly beneficial way of dealing with daily motivational conflicts, which is an essential and frequent task of self-regulation.

Interest in mindfulness is still growing, and research on mindfulness is associated with a large variety of methods and areas of application (Brown and Ryan 2003; Chiesa et al. 2011; Janssen et al. 2018; Kuyken et al. 2016; Waters et al. 2015). Mindfulness can be defined as "self-regulation of attention so that it is maintained on immediate experience" (Bishop et al. 2004, p. 232) with "the emotional–motivational component of non-judging" (Sauer et al. 2011a p. 5), which entails a non-evaluative stance and composure toward mental experiences.

Although mindfulness is sometimes described as a self-regulatory process (e.g., Brown and Ryan 2003; Kabat-Zinn et al. 1985), there is a lack of empirical studies relating mindfulness to general phenomena associated with self-regulation. One important task of self-regulation is the management of motivational conflicts (Emmons et al. 1993; Grund and Fries 2012), and several studies have demonstrated that the experience of frequent and intense goal conflicts is associated with greater psychological distress (Gray et al. 2017). Based on

initial research linking mindfulness to self-regulation (e.g., Grund et al. 2015a; Howell and Buro 2011), we therefore aim to examine to what extent mindfulness helps individuals to deal with the experience of conflicts between daily activities that cannot be performed simultaneously.

To accomplish this, however, mindfulness should not only be considered as an unchanging personal trait characteristic. In non-clinical studies, mindfulness is typically related to other desirable characteristics and behaviors at one point of time, and as a consequence, its quality as a state and possible variability over contexts and time is neglected. Daily changes in state mindfulness and their connections to self-regulation could reveal valuable additional information, for example, regarding which aspects of mindfulness are particularly important, and how they are related to the accompanying experience. However, there is a lack of research exploring mindfulness in natural contexts, and at more than one point in time. Intensive longitudinal methods (Bolger and Laurenceau 2013), such as experience sampling, make it possible to investigate mindfulness, affect, and motivational conflicts as variables, that vary across daily situations, but also depend on the person with his or her specific characteristics. In our paper, we focus on two facets of mindfulness, which we describe in more detail below.

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Mindfulness: Core Characteristics

Within both Buddhism and Western science, opinions and findings seem to diverge on the core characteristics of mindfulness (Gethin 2013; Rapgay and Bystrisky 2009). Regarding the structure of mindfulness, assumptions range from one (Brown and Ryan 2003) to eight (Bergomi et al. 2013) different facets. Although the first approach may neglect important aspects and might be the result of an initial overemphasis of attention (Bodhi 2013), the latter may mirror consequences or techniques to achieve a mindful state. As the essence of mindfulness seems to be "attention and awareness with some important qualifiers about the nature of those faculties" (van Dam et al. 2018, p. 40), we assume that the two facets *presence* and *non-judgment* are the most substantial facets of mindfulness. Presence entails attention on immediate experience (Bishop et al. 2004) and non-judgment a non-evaluative stance and composure toward these mental events. However, these terms are ambiguous: Presence does not imply that mindfulness excludes conscious recollection or future planning (Dreyfus 2013; Heidenreich and Michalak 2004; Rapgay and Bystrisky 2009). In addition, the non-judgment facet should not be understood as cognitively accepting or actively approving of everything (Sauer et al. 2011), but rather a way to gain more flexibility in reacting toward the feelings the contact with the outside world triggers in individuals (Sauer et al. 2011a).

Both facets, presence and non-judgment, are important: To gain insight into the mental events of the present moment, a focused attention towards the immediate experience is necessary, but may not suffice. What is also needed is a non-evaluative stance and composure toward these mental experiences to maintain a calm and equanimous observer's perspective (Sauer 2011). Equanimity, in the present context, refers to "an even-minded mental state or dispositional tendency toward all experiences or objects regardless of their affective valence" (Desbordes et al. 2014, p. 357). It may be seen as the emotional-motivational component of non-judging (Sauer et al. 2011a). Equanimity or emotional calmness alone could in turn result in the avoidance of experiences; accordingly, a balanced, detached perspective must be accompanied by presence and awareness in order to not lose contact to the present experience (this relationship is referred to as dialectics of mindfulness, e.g., Sauer et al. 2011a). But it is not only from a theoretical point of view that the consideration of these two facets is essential. Brown and Ryan (2003) showed interesting associations of acting with awareness, both as a state and a trait, with favorable outcomes, e.g., greater experience of autonomy and better affect during daily activities. However, with the facet non-judgment, psychological symptoms and mental well-being could be better predicted (Baer et al. 2006; Kohls et al. 2009; Petrocchi and Ottaviani 2016).

Other mindfulness facets, such as observing and describing inner and outer stimuli (cf. Five Facet Mindfulness Questionnaire, FFMQ, Baer et al. 2006), may overlap with mindfulness training practices (Grossman and van Dam 2013; Hayes and Shenk 2004), rather than describing the mindfulness state in itself. For example, bare attention can be seen as a procedural directive for cultivating mindfulness, "to get a grip on the appropriate way to observe the phenomenal field" (Bodhi 2013, p. 27). Importantly, when measured with trait mindfulness questionnaires, the observing facet even seems to be slightly associated with higher depressive symptoms (Barnes and Lynn 2010), somatic anxiety, and worry (Rudkin et al. 2018) and shows zero correlations with well-being (Baer et al. 2008) in non-meditating participants. Probably, participants here also erroneously include situations where they were not able to let go of their experiences, e.g. during ruminating, or when they get lost in the observation of the own body. Accordingly, in the present study, we focus on attention to the present experience (presence) and a non-judgmental, equanimous stance toward it (non-judgment) as defining qualities of the mindfulness experience.

Mindfulness as a State

As it applies to other psychological variables, the person-specific tendency to experience mindful states (trait mindfulness) might be distinguished from the actual, momentary state of being mindful. Bishop et al. (2004) argue that mindfulness must be evoked and maintained through attention and an open, non-judgmental attitude, so that mindfulness might be rather seen as a (situation-specific and varying) state than a (person-specific and stable) trait. Similarly, Salomon and Globerson (1987) describe mindfulness as both, "a general tendency and a response to situational demands" (p. 623). Hence, trait mindfulness should predict the occurrence of daily mindful states.

Still, the most common approach to assess trait mindfulness with self-report questionnaires is to ask about the overall frequency of "mindful" or "mindless" behavior (see Baer et al. 2006 and Bergomi et al. 2013, for an overview), which may result in a rather vague estimation. To evaluate the effects of mindfulness training, mindfulness is often measured after training courses. However, in non-clinical studies, mindfulness is typically related to other desirable characteristics and behaviors at one point of time, and as a consequence, its quality as a state and possible variability over contexts and time is neglected. Yet, the measurement of mindfulness as a state is important for measuring its natural occurrence in an ecologically valid way. Although several trait questionnaires already

exist (Bergomi et al. 2013), state questionnaires seem to be less common and are only partially applicable to experience sampling methods. While the State Mindfulness Scale (SMS) by Tanay and Bernstein (2013) mainly emphasizes the observing facet of mindfulness, the Toronto Mindfulness Scale (TMS, Lau et al. 2006) cannot easily be answered outside the context of mindfulness meditation training. State adaptions of the Mindful Attention Awareness Scale by Brown and Ryan (2003) and Nezlek et al. (2016) solely focused on the facet acting with awareness.

Only recently, Friese and Hofmann (2016) used a composite measure of five typical single items of the Five Facet Mindfulness Questionnaire (FFMQ) to assess state mindfulness. However, in their analyses, the authors did not distinguish between the facets, and consequently, specific effects of important mindfulness facets may have been overshadowed. Hence, it was a specific goal of the present study to measure state mindfulness with two critical facets (presence, non-judgment), both between- and within-persons.

Mindfulness, Self-Regulation, and Motivational Conflicts

Some researchers consider mindfulness as a specific self-regulatory capacity (Brown and Ryan 2003; Grund et al. 2015a, 2015b; Grund et al. 2018; Friese and Hofmann 2016), helping individuals to get access to their underlying needs and align them with ongoing goal pursuit. Self-regulation generally refers to "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman and Schunk 2011, p. 4), and entails ongoing forethought, volitional control, and self-reflection. In the following, we would like to explain why situations of motivational conflict can be considered a self-regulatory challenge and why we think that mindfulness is beneficial for self-regulation in general, and for dealing with motivational conflicts in particular.

In everyday life, an important task of self-regulation refers to the management of motivational conflicts (Emmons et al. 1993; Grund and Fries 2012; Grund et al. 2015a). Motivational conflicts occur when two action alternatives have a similarly high value, but cannot be performed simultaneously (Hofer et al. 2007), and often manifest themselves in want or should conflicts (Grund et al. 2015b; Riediger and Freund 2008). These conflicts typically occur in certain contexts (Grund et al. 2014), and are accompanied by specific emotional, cognitive, and behavioral impairments. Want conflicts are characterized by the feeling of wanting to do something different than what one is doing right now. When there is a should conflict, one has the feeling that one should actually do something else. Whereas the former often is accompanied by distracting

thoughts about the missed alternative and a bad mood, the latter could lead to a bad conscience, nervousness, or worry. That also implies that these conflict experiences are neither helpful for the action performed nor for the deferred alternative action. According to Carver and Scheier (1990), positive affect results when progress is made towards a goal or standard. This may explain why motivational conflicts, in which at least one goal must be neglected in favor of another, are often perceived as unpleasant. The missed incentives of the alternative action (e.g., intrinsic, instrumental) can be seen as opportunity costs of the actually performed action (Grund and Fries 2012). The close association between conflict experience and current affect should be considered when examining the effects of mindfulness on conflict experience.

A stage of life in which motivational conflicts are likely to occur frequently is during emerging adulthood (Arnett et al. 2014), ranging from 18 to 29 years. At this age, most people are old enough to decide how they want to shape their lives, whereas identity development is often not yet completed. In addition, students often value performance and well-being to a similar and high degree (Fries et al. 2005; Grund and Senker 2018; Hofer et al. 2007), and compared to school or work, the free organization of time forces decisions to be made. This is perhaps why university students are particularly likely to face conflicts (Riediger and Freund 2008).

Concerning mindfulness as a general self-regulatory capacity, being aware of one's current mental experience may help in the forethought phase of self-regulation to gain more knowledge about personal goals, needs, and values (Shapiro et al. 2006), but also to gain insight into one's own current affective and cognitive state of mind. Therefore, mindfulness can enable individuals to choose actions more wisely by matching situational circumstances with inner experiences (Friese and Hofmann 2016). In line with this reasoning, Brown and Ryan (2003) found that being mindful is related to more autonomous goal pursuits in everyday life. They argue that mindfulness helps to notice prompts for the need for autonomy, competence, and relatedness, and thereby, fosters self-determined behavior. Similarly, Shapiro et al. (2006) describe how mindfulness helps people to recognize and to feel what is meaningful for them (values clarification) and enables them to reflect about own values, interests and needs, instead of adopting them inconsiderately. Accordingly, corresponding findings also show that mindfulness practice is associated with more value-oriented behavior (Donald et al. 2016; Franquesa et al. 2017) and is discussed in regard to its benefits for decision making (Karelaia and Reb 2015). Given that mindfulness is associated with behavior that is congruent with one's own needs, intensive conflicts during these actions should also be less likely. When students make informed decisions due to these reflection processes, for example, when they notice that acting in line with a value made them happy, they can act and

decide consciously and are less likely to experience motivational conflicts (e.g., because actions do not counteract important values).

During the performance phase, mindful individuals may react with composure toward automatic thoughts and impulses, without ignoring information that feelings like unwillingness, guilt, or craving can provide, resulting in cognitive, behavioral, and emotional flexibility (Shapiro et al. 2006). It might be the essence of self-regulation that individuals have the freedom to decide if they want to react automatically (e.g., following one's gut feeling) or when to reconsider automatic cognitive evaluations, emotional reactions, and behavior patterns. Mindfulness may also be directly related to the emotions that occur during the performance phase. Even healthy individuals show positive relationships between mindfulness, momentary happiness, general psychological well-being, and life satisfaction (Friese and Hofmann 2016; Galla 2016; Grund et al. 2015a). This also concerns the self-regulation of actions: With a pleasant mood and affect, motivation - and therefore action execution - might be less destabilized by conflicting action tendencies. More specifically, mindfulness is associated with lower behavioral inhibition (Keune et al. 2012) as one of three early proposed neurophysiological behavioral systems (together with behavioral activation / approach, fight/flight, Gray 1990). Mindfulness, and therefore lower behavioral inhibition, seem to be associated with lower proneness to anxiety, less rumination, and less inhibition of the movement toward goals (Carver and White 1994; Sauer et al. 2011b), which strengthens the assumption of better regulation of goals and affect in mindful individuals. Additionally, to be calm and observing in the face of self-critical, but dysfunctional, and perhaps even pointless thoughts (that might come up during a should conflict) could promote a better recovery and enjoyment in situations in which the feeling of having to do something else is not functional anymore.

Finally, in the reflection phase, mindfulness may make harsh and automatic self-criticism unnecessary because individuals already were aware of what they were doing during the action. Additionally, maladaptive retrospective emotion regulation strategies, such as avoidance or self-focused rumination, may be identified and, if necessary, discontinued more easily when high in awareness of inner processes. This is also consistent with findings of the negative relationship between mindfulness and rumination (e.g., Keune et al. 2012; Petrocchi and Ottaviani 2016) and feelings of regret (Friese and Hofmann 2016). Taken together, mindfulness may help to reduce the occurrence of motivational conflicts, to attenuate their impairments on current affect, cognition, and performance, and lead to a more functional response to the feeling that one wants or should do something else.

Previous Research on Mindfulness and Motivational Conflict

To our knowledge, two studies have investigated the relationship between a general mindful stance and motivational conflicts among students. Grund et al. (2015a) examined the effects of trait mindfulness and self-control for daily aggregated affect and life satisfaction via want and should conflicts with an experience sampling method. Trait mindfulness had a direct effect on aggregated positive affect, and an indirect effect via less should conflicts on life satisfaction. Grund and Senker (2018) found that the beneficial effects of trait mindfulness on self-regulation are context transcending, and therefore not reduced to a general preference for certain groups of actions, such as leisure or learning activities. Additionally, the effect of mindfulness on an anticipated conflict experience was mediated by need satisfaction (autonomy, competence, relatedness, Deci and Ryan 2000), strengthening the assumption of a wiser choice of actions among mindful individuals. Yet, in these studies, no statements could be made about mindfulness as a state.

In complement to these studies, Friese and Hofmann (2016) examined the connection between state mindfulness and self-regulation more generally. First, the authors discussed some possible risks of mindfulness for self-regulation. They assumed that indulgence (as the counterpart to restraint) might be more likely when individuals strengthen their mental representation of their desire through attention to their mental experiences and that the acceptance of experiences could lead to less intrapsychic conflict experiences, and therefore less restraint. The authors used experience sampling methods to examine the relationship of self-regulation (in terms of resisting daily desires) and state mindfulness. Friese and Hofmann's (2016) hypotheses were supported, but with an interesting reinterpretation of their results. Indeed, individuals high in state mindfulness experienced less conflicts with their desires and enacted their desires more often. But, this was only the case if the perceived conflict with long-term goals was low, and the conflicting goal, which has to be deferred, was less important. Additionally, they found that individuals were happier (regardless of whether they enacted or resisted a desire), and felt less regret and guilt, if they were high in state mindfulness. They concluded that with mindfulness, it is possible to combine the best of two worlds (restraining vs. indulging), and that self-regulation might be a tool in the service of goal attainment, which is more wisely used by mindful individuals.

The Present Study

Mindfulness is associated with adaptive self-regulation and well-being, and therefore, should be beneficial for individuals

dealing with daily motivational conflicts. Such intrapsychic conflict experiences, in turn, seem to be of great relevance for well-being (cf., Gray et al. 2017), particularly among young adults (Riediger and Freund 2008). However, the specific interplay between mindfulness, intrapsychic conflict experiences, and affective well-being remains somewhat unclear, especially with respect to daily experiences in natural contexts. More precisely, it is quite obvious that experiences of intrapsychic conflict are unpleasant experiences. In addition, there is ample research showing that mindfulness contributes to an individual's well-being and mental health. However, in order to learn something about the specific effect that mindfulness may have on the management of daily conflict experiences, it seems necessary to control current affect, and to consider both interindividual differences (i.e., between-person effects) and natural fluctuations in mindfulness (i.e., within-person effects), thereby extending previous research regarding the connections between mindfulness, motivational conflicts, and well-being (e.g., Grund et al. 2015a).

Hence, in addition to convergent validity of trait and state mindfulness, we hypothesize that daily state mindfulness, measured with the two facets presence and non-judgment, predicts the intensity of daily want- and should conflicts. Moreover, state mindfulness should have a significant predictive value in addition to trait mindfulness, and we expect this pattern to remain unchanged even when momentary affective well-being is taken into account.

Method

Participants

With an average age of $M = 23.52$ years ($SD = 3.59$, range from 19 to 38), the data of 56 students from a medium-sized German university was included in the study (38 female, 18 male). The data of one person had to be excluded from all analyses due to technical reasons (originally there were 57 participants); another participant unsubscribed herself after the experience sampling period, but the data collected until then could remain in the main analysis. On average, the students were in their sixth semester ($M = 6.09$, $SD = 3.01$, range 2–12 semesters) and heterogeneous with regard to the courses of studies (20 different subjects). With $M = 1.55$ ($SD = 1.00$) on a 4-point scale, previous experience with meditation, yoga, or mindfulness was scarce and 45 participants indicated that they have (almost) no previous experience at all. Hence, this sample can be considered as rather inexperienced regarding meditation practices. Participants were recruited in the university hall with flyers and notices. The measurement period was set in September, when students usually study for exams and/or write their final theses or term papers, while lectures are not held any more. Because some students do not study in September and go on vacation, and "learning vs. leisure conflicts" are the most common experienced conflicts among university students, an inclusion criterion was that the participants planned to work on an important study task (e.g., writing an essay or their thesis, preparing for an exam) during the experience sampling period to ensure that motivational conflicts were likely to occur.

Procedure

At an introductory session, all participants received information about the experience sampling procedure and gave informed consent for participation. They completed two trait mindfulness questionnaires and a demographic questionnaire. The study was intended to answer further questions in the context of higher education; accordingly, the participants completed measures on achievement emotions, achievement motivation, self-compassion, self-control, life satisfaction, affect, study load, and social desirability as well, which are not included in this study. During the following eight consecutive days, students received short questionnaires via smartphone. Five signals per day were sent at random times between 9 a.m. and 8 p.m., with a minimum interval of 60 min and a response window of 15 min. In addition, the students received an evening questionnaire regarding daily stress and time management, which we also will not discuss further in the present paper. The eighth day was optional and gave participants the opportunity to make up for missed signals. At the end of the study, the participants answered trait questionnaires again, (mindfulness, self-compassion, life satisfaction, affect, and study load). Depending on the number of answered signals, the students received up to 40€ for participation.

Measures

Between-Person: Trait Mindfulness

The participants received two trait mindfulness questionnaires, which were answered on individual computers during the introductory and final session. To capture the presence facet of mindfulness on a trait level, we used the German version (Michalak et al. 2008) of the Mindful Attention and Awareness Scale (MAAS) by Brown and Ryan (2003). The scale is supposed to mirror "individual differences in the frequency of mindful states over time," and contains 15 statements regarding experiences such as "driving on autopilot." It contains a 6-point scale from 1 (almost never) to 6 (almost always). The internal consistency was good (Cronbach's $\alpha = .83$ in Michalak et al. 2008, in the present study, $\alpha = .76$), and the item total correlations were $r_{it} > .18$ in Michalak et al. (2008).

The subscale accept without judgment of the Kentucky Inventory of Mindfulness Skills (KIMS) by Baer et al. (2004) contains nine statements regarding attitudes toward one's own thoughts and feelings (e.g., "I criticize myself for having irrational or inappropriate emotions"). In the present study, this scale was used to represent the mindfulness facet non-judgment on a trait level. Internal consistency (i.e., Cronbach's alpha) of the German version was estimated at $\alpha = .89$ by Ströhle et al. (2010), and in the present study, it was $\alpha = .91$. All item total correlations were above $r_{it} = .43$ in Ströhle et al. (2010). Contrary to the original 5-point scaling, we used a 6-point scale from almost never to almost always, to prevent the participants from making mistakes when proceeding to the next scale. The KIMS subscale accept without judgment mirrors an evaluative and hostile stance towards one's own mental experiences, which also could be seen as absence of a decentered, mindful perspective (Bernstein et al. 2015). We have recoded both MAAS and the KIMS subscale so that higher values correspond to higher mindfulness.

Within-Person: Affective Well-Being, State Mindfulness, and Motivational Conflicts

The short questionnaires were presented on participants' smartphones via a survey application. After they were asked about the current context of action (e.g., studying, leisure time), participants indicated their momentary affective well-being with the PANAVA-KS (Schallberger 2005). Although it is likely that mindfulness predicts momentary affect, we see affective well-being here as a control variable to examine motivational conflict as a unique phenomenon in its own terms. The scale has been explicitly designed for experience-sampling contexts and is based on the affect model of Watson and Tellegen (1985) and its evolution (Tellegen et al. 1999). Positive activation (PA, four items) and negative activation (NA, four items) depict two relatively independent bipolar dimensions that underlay a higher-order bipolar happiness–unhappiness valence dimension (VA, two items). Items like "I felt... bored vs. enthusiastic" (PA) and "I felt … calm vs. nervous" (NA) are rated on a 7-point bipolar scale. The PANAVA-KS has proven convergent and divergent validity with the Positive and Negative Affect Schedule (Schallberger 2005), and with complex hierarchical analyses, the authors estimated a reliability of .92–.94 on the person level and .71–.78 on the time level. Because PA and NA correspond to Gray's behavioral activation and inhibition system (Watson et al. 1999), and especially NA is highly negatively related to VA, we focus on the activation scales of the PANAVA-KS, and hope that the abandonment of valence simplifies the following analyses.

In order to assess momentary mindfulness comprehensively and based on our theoretical concept of mindfulness, we developed a state mindfulness scale with two facets, each containing four items. Mainly, the items are based on existing trait scales and were adapted for experience sampling. Half of the items were coded reversely to avoid measuring mindfulness only by its absence. The items were then formulated in such a way that they refer to the participants' current activity, and characterize it with regard to aspects of awareness (presence, corresponding to the trait MAAS scale or the KIMS subscale acting with awareness) and a non-judgmental attitude during the action (non-judgment, similar to trait KIMS subscale accept without judgment). It should be ensured that the participants can answer the questions in everyday situations, regardless whether they have any meditation experience or not. Due to the repeated presentation, the conciseness of the questionnaire was essential.

We inspected the new state mindfulness items in terms of their reliability and factorial structure. Following Bolger and Laurenceau (2013), we determined the reliability of within-person differences in change over time, making use of the generalizability theory, where the systematic person*measurement point (time) variance of state mindfulness is related to its error variance. The resulting R_C (reliability of within-person changes) of .82 for presence and .62 for non-judgment indicate that both four-item measures of state mindfulness can assess within-person change reliably (i.e., there is adequate systematic person*time variance), especially in cases of state presence. Multilevel confirmatory factor analyses indicated that a two-factor model (CFI = .87; RMSEA = .07; SRMR$_{within/between}$ = .06/.11), with the correlated latent factors presence and non-judgement, yielded a better model fit when compared to a single-factor model (CFI = .78; RMSEA = .08; SRMR$_{within/between}$ = .09/.10) and an orthogonal two-factor model (CFI = .80; RMSEA = .08; SRMR$_{within/between}$ = .16/.32). In the two-factor model, the factor correlation was .57/.84 at the within/between level, respectively. Factor loadings from this model at the within and between level are depicted in Table 1 and indicate that factor loadings were somewhat higher for presence compared to non-judgment and at the between- compared to the within-person level.

The short questionnaire ended by asking participants about the intensity of any want or should conflict (e.g., "How strong did you feel during the activity that you wanted to do something else?" and "How strong did you feel during the activity that you should do something else?"). Depending on their answer, participants received further questions regarding the consequences of a possible conflict (e.g., a guilty conscience) or filler items to make sure that the response behavior was not affected by a change in the number of items. These questions are not part of the present study.

Table 1 Item Characteristics and Standardized Factor Loadings of State Mindfulness Items

Scale	Item	Factor loading[b]	
		Within	Between
Presence			
1	I rushed through what I was doing without being attentive to it.[a]	0.61	0.82
2	I could fully concentrate on the present moment.	0.83	1.00[c]
3	My mind often wandered off, so I didn't pay attention to what I was doing.[a]	0.77	0.83
4	I was entirely occupied with what I was doing and thought of nothing else.	0.73	0.90
Non-Judgment			
1	I asked myself, how appropriate, useful, or valuable is the activity.[a]	0.63	0.75
2	I performed the activity without actually judging it.	0.60	0.81
3	I made sure I fulfill certain expectations.[a]	0.33	0.46
4	I felt inwardly well-balanced.	0.59	0.79

Notes. [a] Inversed item. [b] STDYX Standardization. $N = 56$ persons. $n = 1889$ situations. [c] The between factor loading for this item was additionally fixed to 1 to avoid a negative residual variance

Results

Descriptive Statistics

On average, participants answered $M = 33.73$ ($SD = 6.00$) signals of 35 mandatory signals (96.37%, minimum for full payment) and 40 possible signals (84.33%, number of all signals sent), resulting in a total of $N = 1889$ recorded situations. Leisure activities (27.6%), studying (29.8%), and daily routines (30.7%) were the most frequently mentioned activities, followed by side jobs (7.7%) and other (4.2%).

The trait mindfulness scales MAAS and KIMS accept without judgment correlated at $r = .48$. Descriptive statistics, the intra class correlations (ICCs) and between and within bivariate correlations of the main state variables are presented in Table 2. According to Bolger and Laurenceau (2013), the ICCs derived from random intercept models (Langer 2009) show a common level of non-independence. The panel plots in Fig. 1 correspond to these findings and show the intra-individual fluctuation of both state mindfulness facets across the experience sampling period, for each participant individually. Non-judgment seems to change less strongly from one measurement point to the next

and therefore shows a flat line for most individuals, while presence seems to fluctuate stronger in most participants with more jagged lines. It can be seen that the state mindfulness scales presence and non-judgment each show a small to medium negative correlation with motivational conflicts. Overall, the correlations tend to be higher at the between person level than at the within person level. Subsequently, these relationships will be analyzed in more depth.

Multi-Level Analyses

We used experience sampling methods to gain repeated measurement data of each person. Therefore, the resulting situational data (Level 1) is not independent, but must be understood in the context of each person (Level 2). Accordingly, there is variance within persons (state level) and between persons (trait-level) that might be explained by both trait and state predictors. We conducted multi-level regression analyses to take this hierarchical structure into account. We used Maximum Likelihood parameter estimates and accounted for the autocorrelation of residuals at Level 1, which indicate whether closer measurement points are more similar to each

Table 2 Descriptive Statistics, Within- and Between-Correlations of State Variables

State variables (L1)	M_{person}	SD_{person}	ICC	1	2	3	4	5	6
1. Presence	4.21	0.55	.20		.38**	.32**	−.33**	−.28**	−.12**
2. Non-Judgment	4.32	0.64	.35	.65**		.22**	−.42**	−.31**	−.10**
3. Positive activation	4.10	0.53	.24	.71**	.49**		−.38**	−.20**	−.09**
4. Negative activation	3.19	0.71	.35	−.60**	−.73**	−.72**		.29**	.06**
5. Want conflict	2.38	0.87	.23	−.45**	−.45**	−.33**	.49**		.30**
6. Should conflict	2.50	0.93	.26	−.23	−.34**	−.28*	.48**	.71**	

Notes. Means and standard deviations of person means ($N = 56$). Correlations of person-mean centered state values (within-correlation, $N = 1889$) above the diagonal, correlations of person means (between-correlation, $N = 56$) below. * $p < .05$. * $p < .01$
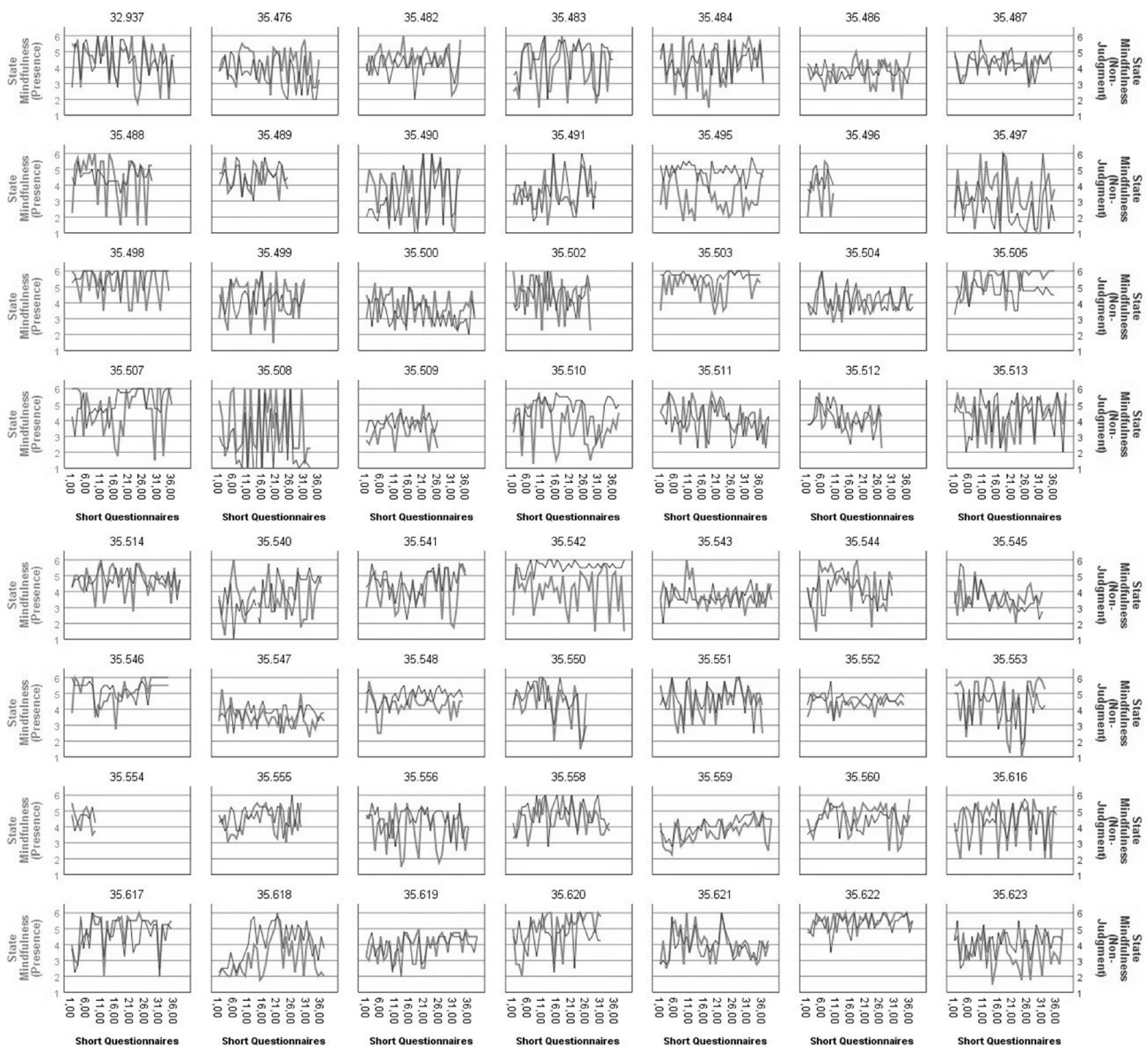
Fig. 1 Within person fluctuations of the state mindfulness facets presence and non-judgment across the experience sampling period. This figure was created with IBM SPSS Statistics for Windows, Version 25.0

other (Bolger and Laurenceau 2013). Intercepts and slopes were allowed to vary in all models, except from the slopes of Level 2 variables (MAAS und KIMS), which are always constant within persons. Predictor variables on the situational Level 1 (presence, non-judgment, positive activation, negative activation) were group mean centered which means that they represent the deviations from each person's average value in the repeated measurements and thus natural fluctuations.

To examine the relationship between established dispositional mindfulness measures and the state mindfulness measures, we conducted two multi-level analyses prior to the main analyses. Both Level 2 predictors (MAAS, KIMS: accept without judgment) were included in the model simultaneously, and it was tested, whether both trait mindfulness scales predict state presence and state non-judgment as dependent variables, respectively. MAAS did not yield an effect on momentary presence, ($b = -0.12$, $SE = 0.13$, 95% CI $[-0.39, 0.15]$, $t(57.56) = -0.87$, $p = .39$) in contrast to the KIMS subscale accept without judgment, $b = 0.21$, $SE = 0.07$, 95% CI $[0.06, 0.36]$, $t(55.82) = 2.87$, $p < .01$. The MAAS yielded no significant fixed effect on momentary non-judgment either, $b = -0.10$, $SE = 0.15$, 95% CI $[-0.40, 0.20]$, $t(57.42) = -0.67$, $p = .50$, whereas the KIMS subscale accept without judgment did, $b = 0.31$, $SE = 0.09$, 95% CI $[0.15, 0.47]$, $t(56.24) = 3.79$, $p < .001$. Hence, convergence
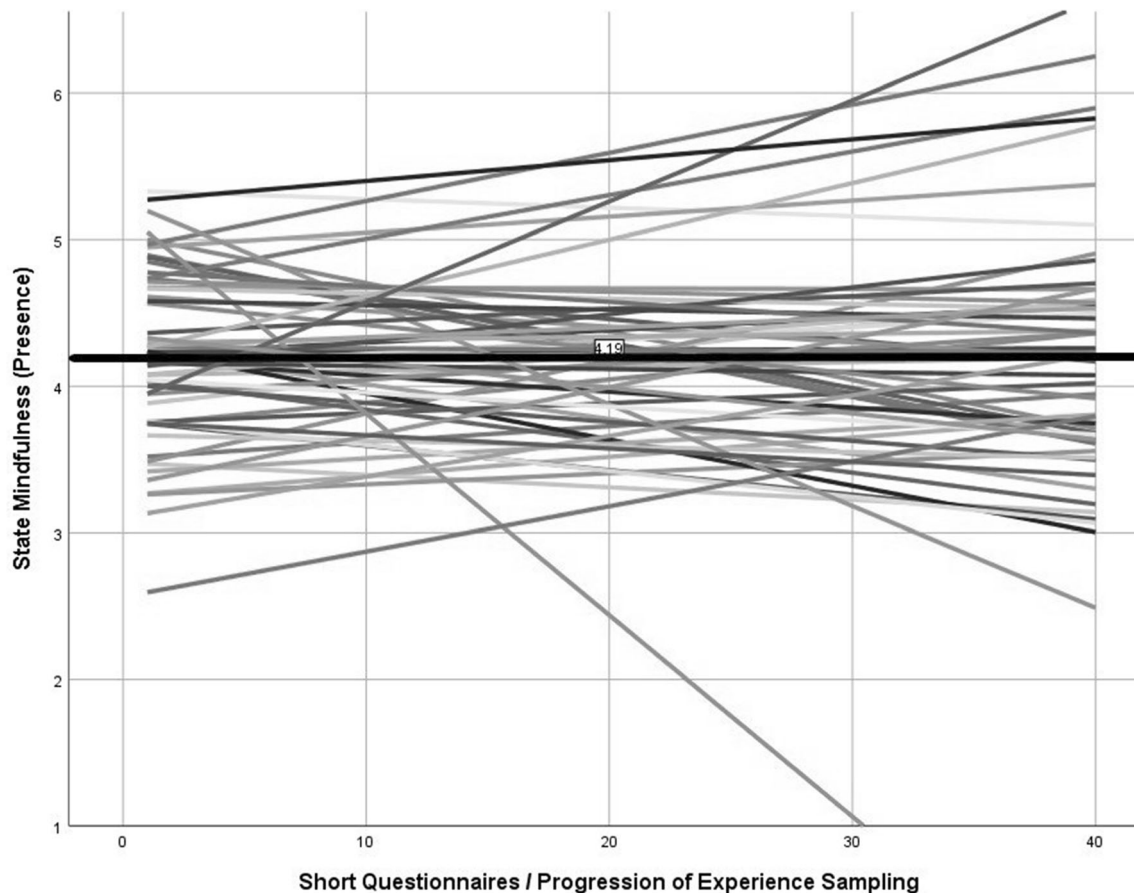
Fig. 2 Individual linear regression lines of each participant for the state mindfulness facet presence, predicted by the progression during the experience sampling period (with approx. 34 measurement points). This figure was created with IBM SPSS Statistics for Windows, Version 25.0

between trait and state mindfulness could be found only with regard to the KIMS subscale accept without judgment.

In order to examine a possible temporal trend in addition to the fluctuations of the actual values shown in Fig. 1, Figs. 2 and 3 depict the individual linear regression lines of each participant for the state mindfulness facets presence and non-judgment predicted by the progression during the experience sampling period (with approx. 34 measurement points). For the state mindfulness facet presence, most regression lines are close to the average regression line and have no substantial slopes. Consequently, there was no fixed effect of progression ($b = 0.001$, $SE = 0.002$, 95% CI [−0.004, 0.01], $t(601.62) = 0.33$, $p = .74$). For non-judgment, there was a very small increase during the experience sampling period ($b = 0.005$, $SE = 0.002$, 95% CI [0.001, 0.01], $t(570.28) = 2.35$, $p < .05$).

Mindfulness and Motivational Conflict

We were particularly interested in the associations of mindfulness with momentary want- and should conflict experiences. We controlled for momentary affective well-being which served as an additional predictor variable. As can be seen in Model 1 from Table 3, MAAS and KIMS (accept without judgment), as Level 2-predictors, yielded no significant effect on momentary want conflict intensity. The effect of the KIMS subscale accept without judgment fell just short of statistical significance ($p = .05$). When both Level-1 state mindfulness facets were included (Model 2), the expected negative effect on want-conflict intensity became visible and remained significant, even when positive and negative activation were added (Model 3). That is, the more participants felt present, non-judgmental, and energetic, the less intensely they experienced want conflicts during their daily engagements. Conversely, when participants reported more momentary stress and anger, they experienced more intense want conflicts. The intercepts and the slopes of the regression lines of state non-judgment (Level 1) and momentary positive activation (Level 1) on want conflict intensity varied between persons.

Turning to should conflicts (see Table 4), the pattern changed. The KIMS (accept without judgment, Level 2) yielded an effect on should conflict intensity (Model 1), which remained significant even when the Level-1 state mindfulness scales were added. Momentary presence, but not non-judgment, yielded an additional significant effect on should conflict intensity. Participants who were more oriented toward the present experience in a particular moment, and had a non-judgmental attitude
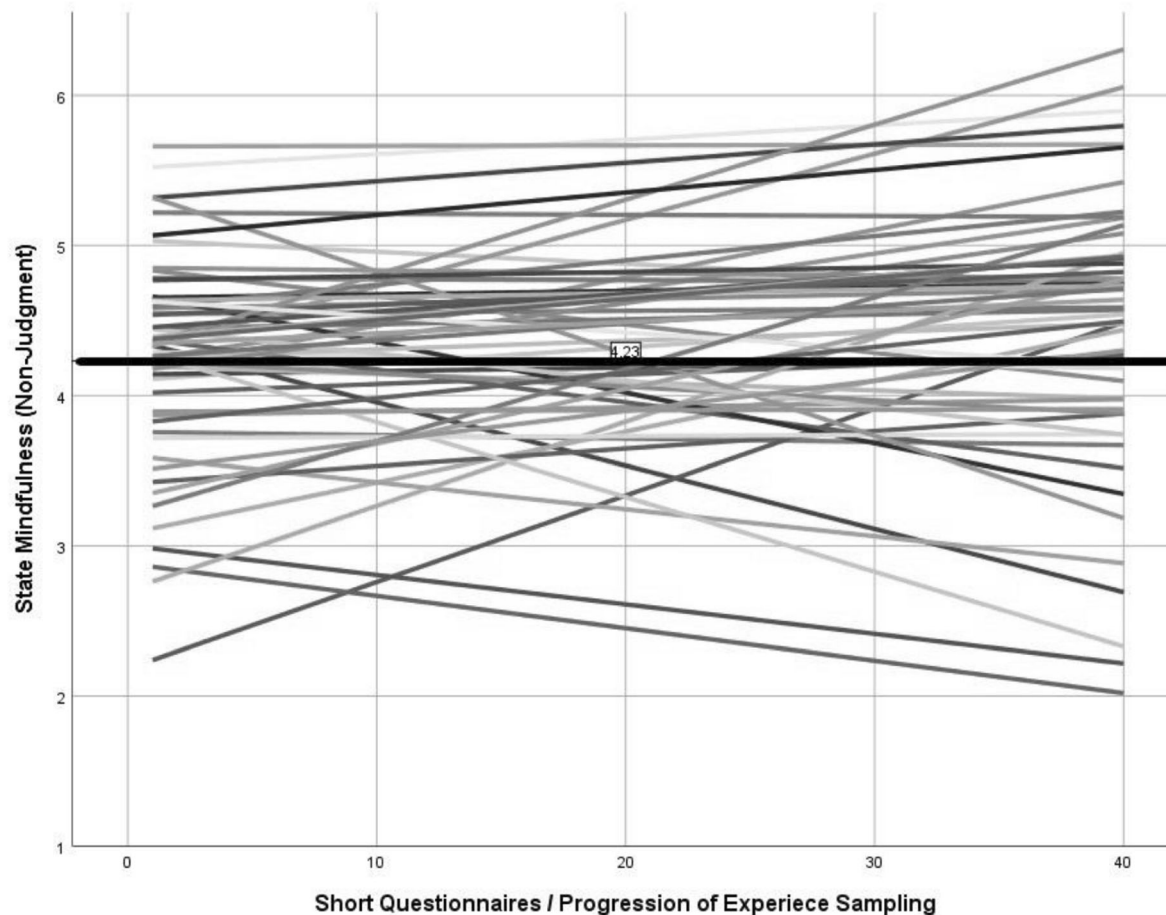
Fig. 3 Individual linear regression lines of each participant for the state mindfulness facet non-judgment, predicted by the progression during the experience sampling period (with approx. 34 measurement points). This figure was created with IBM SPSS Statistics for Windows, Version 25.0

toward mental experiences in general, reported less intense should conflicts in everyday life. The inclusion of momentary affective well-being (Model 3) did not lead to a different interpretation of the effects, and consequently, presence and the KIMS subscale accept without judgment remained significant predictors. Positive and negative activation yielded no additional significant effect on should conflict intensity. The intercepts and the slopes of the regression lines of non-judgment on should conflict intensity varied between persons.

Discussion

Trait Mindfulness, State Mindfulness, and Motivational Conflicts

Mindfulness seems to be helpful for well-being and mental health in general, but also to promote value-oriented, conscious, and flexible self-regulation in everyday life. However, mindfulness has rarely been considered as a state that can vary from one moment to the next. In addition, the

consideration of two defining core aspects of mindfulness, namely a non-judgmental stance in addition to being present, may lead to potentially interesting information remaining undiscovered otherwise.

The present study links mindfulness with motivational conflicts as daily challenges of self-regulation. In line with our hypotheses, our results indicate that state mindfulness with the facets presence and non-judgment is negatively associated with the experience of want conflicts in university students. Being mindful in everyday life therefore also means experiencing less intensive that one wants to do something else than what one is currently doing. This might be due to wiser, more value congruent, decisions. As a consequence, considering that actions are likely to be disturbed by thinking about (not performed, possibly more attractive) action alternatives, mindfulness might also reduce post-decisional motivational interference effects (e.g., Grund et al. 2015a). Finally, experiencing want conflicts might manifest itself in feelings of regret (because of a seemingly "wrong" decision) and negative emotions (here, less positive, but more negative activation like anger and stress), on which mindfulness may have an

Table 3 Multilevel Regression of Trait Mindfulness, State Mindfulness, and Activation on Want Conflict Intensity

| | Want-conflict intensity | | | | | | | | |
| | Model 1 | | | Model 2 | | | Model 3 | | |
	Estimate	SE	95% CI	Estimate	SE	95% CI	Estimate	SE	95% CI
Fixed effects (b)									
Intercept	2.85***	0.82	1.21, 4.49	2.83**	0.82	1.19, 4.47	2.82**	0.82	1.18, 4.46
MAAS (L2)	0.12	0.22	−0.32, 0.56	0.12	0.22	−0.32, 0.56	0.12	0.22	−0.31, 0.56
KIMS[a] (L2)	−0.24†	0.12	−0.48, −0.00	−0.24†	0.12	−0.48, 0.00	−0.24†	0.12	−0.48, 0.00
Presence (L1)	–	–	–	−0.31***	0.04	−0.38, −0.23	−0.23***	0.04	−0.31, −0.16
Non-judgment (L1)	–	–	–	−0.43***	0.06	−0.56, −0.30	−0.33***	0.06	−0.45, −0.21
Positive activation (L1)	–	–	–	–	–	–	−0.12*	0.06	−0.24, −0.00
Negative activation (L1)	–	–	–	–	–	–	0.24***	0.05	0.13, 0.35
Random effects									
Level 1 (variances)									
Residual (ε_{ij})	2.22***	0.08	2.07, 2.37	1.83***	0.06	1.71, 1.96	1.72***	0.06	1.60, 1.85
Autocorrelation (ρ)	0.18***	0.02	0.13, 0.23	0.17***	0.03	0.12, 0.22	0.16***	0.03	0.11, 0.21
Level 2 (variances)									
Intercept (u_{0j})	0.60***	0.13	0.39, 0.92	0.62***	0.13	0.41, 0.94	0.62***	0.13	0.41, 0.94
Slopes presence (u_{1j})	–	–	–	0.02	0.02	0.00, 0.09	0.01	0.01	0.00, 0.13
Slopes non-judgment (u_{2j})	–	–	–	0.12**	0.04	0.05, 0.22	0.08*	0.04	0.04, 0.19
Slopes pos. Activation (u_{3j})	–	–	–	–	–	–	0.07*	0.03	0.03, 0.18
Slopes neg. Activation (u_{4j})	–	–	–	–	–	–	0.05	0.03	0.02, 0.14

Notes. *** $p < .001$. ** $p < .01$ * $p < .05$. † $p < .10$ [a] subscale *accept without judgment*. L1 within-person variable. L2 between-person variable

Table 4 Multilevel Regression of Trait Mindfulness, State Mindfulness, and Activation on Should Conflict Intensity

| | Should conflict intensity | | | | | | | | |
| | Model 1 | | | Model 2 | | | Model 3 | | |
	Estimate	SE	95% CI	Estimate	SE	95% CI	Estimate	SE	95% CI
Fixed effects (b)									
Intercept	4.13***	0.84	2.44, 5.82	4.12***	0.84	2.44, 5.81	4.12***	0.84	2.43, 5.81
MAAS (L2)	−0.11	0.23	−0.56, 0.34	−0.11	0.23	−0.56, 0.34	−0.11	0.23	−0.56, 0.34
KIMS[a] (L2)	−0.30*	0.12	−0.55, −0.05	−0.30*	0.12	−0.55, −0.05	−0.30*	0.12	−0.55, −0.05
Presence (L1)	–	–	–	−0.15***	0.04	−0.23, −0.07	−0.13**	0.04	−0.22, −0.04
Non-judgment (L1)	–	–	–	−0.10	0.07	−0.23, 0.03	−0.10	0.07	−0.23, 0.04
Positive activation (L1)	–	–	–	–	–	–	−0.09	0.05	−0.20, 0.01
Negative activation (L1)	–	–	–	–	–	–	−0.01	0.05	−0.11, 0.08
Random effects									
Level 1 (variances)									
Residual (ε_{ij})	2.17***	0.07	2.03, 2.32	2.03***	0.07	1.90, 2.18	2.00***	0.07	1.86, 2.14
Autocorrelation (ρ)	0.14***	0.02	0.09, 0.19	0.14***	0.03	0.09, 0.19	0.13***	0.03	0.08, 0.18
Level 2 (variances)									
Intercept (u_{0j})	0.65***	0.14	0.43, 0.99	0.66***	0.14	0.43, 1.00	0.66***	0.14	0.43, 1.00
Slopes presence (u_{1j})	–	–	–	0.02	0.02	0.00, 0.09	0.02	0.02	0.01, 0.09
Slopes non-judgment (u_{2j})	–	–	–	0.11**	0.04	0.05, 0.24	0.11*	0.04	0.05, 0.24
Slopes pos. Activation (u_{3j})	–	–	–	–	–	–	0.02	0.02	0.00, 0.11
Slopes neg. Activation (u_{4j})	–	–	–	–	–	–	0.01	0.02	0.00, 0.22

Notes. *** $p < .001$. ** $p < .01$. * $p < .05$. [a] Subscale *accept without judgment*. L1 within-person variable. L2 between-person variable

additional beneficial effect. This could be particularly helpful for actions experienced as duties or "must do".

When scoring higher on trait mindfulness and momentary presence, students also experienced less intensive should conflicts. Beyond the effect of mindfulness, current affect could not explain should conflicts, which is surprising, since should conflicts are usually accompanied by feelings of tension, worry, guilt or stress (especially, a "bad conscience"). Possibly, a potential effect was already explained through the consideration of mindfulness. Should conflicts might be particularly unpleasant when students are attempting to relax or recover, but at the same time, having a should conflict also shows what else is important to them. To distance oneself from these cognitions and, at the same time, not losing sight of the neglected goal, might be especially important.

Taken together, the advantage of having a large variety of choices about how to shape one's life seems to be in parts offset by the constant feeling of missing an alternative action (i.e. wanting or having to do something else). Mindfulness is negatively associated with such experiences, and might therefore help to counteract negative effects of motivational conflicts.

As expected, the beneficial connection found between mindfulness and conflict experience was still evident when considering how the students felt during their activities. The latter finding is important because it shows that the relationship found between mindfulness and experiences of motivational conflict is not just an epiphenomenon of feeling generally happy or relaxed, which, for instance, might be due to the nature of the carried out tasks (Grund et al. 2014). However, the direction of the relationship cannot be determined conclusively in our present study. It is possible that students who were mentally present did not judge their behavior and felt better, and therefore did not want to do anything else. However, perhaps the reverse might be the case: Because they felt comfortable with their current activity and did not want to do anything else, they were able to be more aware of what they were doing, and to not judge their activity in terms of performance, for example. Hence, more elaborated designs are needed to pin down the exact processes (cf., Bolger and Laurenceau 2013).

Surprisingly, students with higher dispositional mindfulness according to MAAS did not experience more mindful states during their daily life. In contrast, a higher dispositional mindfulness indicated by the KIMS subscale "accept without judgment" predicted state "presence", which we expected originally to be more similar to the content of the MAAS (being "present", acting with awareness). Therefore, the KIMS subscale accept without judgment may be better suited to predict mindful states.

Another unexpected finding was that only the state mindfulness facet presence together with non-judgment as a trait predicted the intensity of should conflicts, while non-judgment as a state was not directly associated with a lower intensity of should conflicts. Possibly, apotential effect of the state facet was already reflected in the corresponding trait subscale (accept without judgment), which explains substantial variance of the conflict intensity itself.

The results regarding the relationship of the non-judgment facet of trait mindfulness with daily conflicts experiences strengthens the empirical relevance of a "non-judgmental stance toward internal experience" (Baer et al. 2004, p. 204). In the non-judgment state facet, there was more variance that could be explained by between-persons variables than with presence, emphasizing its quality as a general stance rather than a strongly situation-dependent condition. Together with the repeated observation that non-judgment is a more important factor for many psychological symptoms than other facets (e.g., Baer et al. 2006; Kohls et al. 2009), those findings underline the importance of taking this facet into account in the measurement of (state) mindfulness. This is consistent with the assumptions of *bare attention* being a method or technique, rather than mindfulness itself (Bodhi 2013). In line with the findings of Petrocchi and Ottaviani (2016), the non-judgment facet in our study, too, had stable and complex associations with well-being and self-regulation.

But why do individuals who do not condemn their own mental experiences, either on the situational or personal level, experience less intense conflicts? What could be a common underlying mechanism of mindfulness that leads to values clarification and adaptive emotion regulation? Even though there are many different assumptions and findings on possible mechanisms of mindfulness, decentering seems to be a promising higher level mechanism, similar to the assumed meta-mechanism of reperceiving (Shapiro et al. 2006). Decentering is "a process through which one is able to step out of one's immediate experience, thereby changing the very nature of that experience" and introduces "a gap between the event and one's reaction to that event" (Safran and Segal 1990, p. 117). If one's own mental experiences are judged, condemned, or avoided (as we would expect when persons score low on the non-judgment facet), this has consequences for subsequent mental processes. An example is how a thought like "I'm so bad at math, I'm definitely going to fail the exam." loses its impact on emotion and motivation as soon as it is described with "I am thinking a self-critical thought." This meta-awareness (Bernstein et al. 2015, Fresco et al. 2007) could enable individuals to choose self-congruent actions and to be less prone to unfavorable consequences of previous decisions against an alternative action (e.g., a reduced mood, remorse, regret, and distracting thoughts), thereby improving

adaptive self-regulation and reducing motivational conflict experiences.

Limitations and Outlook

The sample of this study consists of university students who studied for an exam or worked on another important task related to their studies. Since they can arrange leisure and study time flexibly, university students seemed to be ideal for the study of motivational conflicts. Additionally, the findings of Grund et al. (2015a) and previous studies on motivational interference of university students (e.g., Grund et al. 2014) could be complemented directly by the present findings. Certainly, the limitation to an academic context has disadvantages regarding the generalizability of the found results. University students are characterized by certain demographic characteristics, for example regarding education and their socioeconomic status, which are shared by neither all young adults of the same age nor by older adults. Additionally, young adults seem to experience their life to be characterized by feeling in-between, continued identity development, and instability (Arnett 2000). This corresponds to findings of Riediger and Freund (2008), who found that the frequency of motivational conflicts decreases in older adults together with an increase in well-being. However, it is not unlikely that the experience of conflicts and their quality differs in older adults too. For example, the struggle between domains like work and family could result in similar intense and impactful conflicts experiences, thereby affecting an individual's well-being (Grund et al. 2016).

The analyses of this study have not yet addressed differences that may arise from different contexts of action. For example, the connection between mindfulness and motivational conflicts could become more evident in the context of self-regulated learning than in often automatically performed daily routines or intrinsically motivated leisure time (cf., Grund et al. 2014; Grund and Senker 2018). Also it could be influenced by other contextual variables such as the time of day, etc. With our current approach to assess experiences of motivational conflict, we were also not able to differentiate between pre-decisional, performance-related, and post-decisional effects of mindfulness. For example, it remains unclear whether participants were less tempted by possible action alternatives in the first place, or showed less cognitive and emotional reactivity towards such experiences. Future research should therefore consider such specific effects of (state) mindfulness in more detail.

Disadvantages of self-report measurement, such as socially desirable responding, also apply to this study. However, our experience sampling method may be at least an improvement regarding ecological validity and reduces retrospective biases (Bolger and Laurenceau 2013). Multi-level analyses and therefore the consideration of both within- and between-persons effects and the repeated instead of single measurement of the constructs of interest may add further advantages in comparison to commonly used single pen-and-pencil questionnaires.

Speaking of validity and psychometric quality, the interpretation of the results regarding state mindfulness should be interpreted with caution. Although we found support for the (within) reliability of the two state mindfulness facets, especially for presence, convergent relationships to trait non-judgment, and meaningful relationships to momentary well-being, future research regarding the validity of this measure is needed. Regarding the connection of state mindfulness with the MAAS trait questionnaire (Brown and Ryan 2003), it remains unclear how well the state scales matched the MAAS. Possibly, the interpretation of the MAAS differed from what participants experienced during the experience sampling. Grund et al. (2015a) found an indirect effect of trait mindfulness measured with the MAAS on life-satisfaction via less should conflicts, but in the present study, the MAAS did not yield an effect on motivational conflict experience. Maybe specific effects of the scale were masked due to the simultaneous analysis of the KIMS subscale.

Similar to the vast amount of previous studies, we assumed an additive, partly overlapping effect of the mindfulness facets presence and non-judgment as two central components among possible others. If, in order to be mindful, both aspects must be given to some degree, a multiplicative relationship of the facets is also conceivable. Probably, interaction even exist across levels (for example, an interaction of a particular attitude with a certain state of perception). Future research could possibly address this question.

Another limitation is that we did not manipulate mindfulness directly, as would be helpful for experimental evidence. In line with other research (e.g., Bishop et al. 2004; Brown and Ryan 2003), we see mindfulness as a natural capability that can be fostered through training. Based on the method of experience sampling, the data should be particularly ecologically valid for individuals who do not meditate, but still have a certain way of acting with more or less awareness, and with or without judging their experiences. This approach should also ensure that mindfulness, as a psychological construct, is not confounded with its training techniques. Nevertheless, future research could strengthen the content validity of the state mindfulness items by relating it to within-person processes of mindfulness training effects (e.g., Galla 2016).

Conclusion

The results of the present study emphasize the value of investigating the relationship of mindfulness and self-regulation. State mindfulness and the KIMS subscale accept without judgment proved to be complex and beneficial predictors of the experience of motivational conflicts. Important tasks of

self-regulation might be better solved by individuals who consider themselves as being present, non-judging, and at peace with their own mental experiences. Accordingly, in situations where individuals are mindful, their experience of action is less interfered by attractive action alternatives or obligations. This opens up valuable opportunities for reducing the experience of motivational conflicts.

Compliance with Ethical Standards

Informed consent was obtained from all individual participants included in the study. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

References

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist 55*(5), 469–480. https://doi.org/10.1037//0003-066X.55.5.469

Arnett, J. J., Žukauskienė, R., & Sugimura, K. (2014). The new life stage of emerging adulthood at ages 18–29 years: Implications for mental health. *The Lancet Psychiatry, 1*, 569–576. https://doi.org/10.1016/S2215-0366(14)00080-7.

Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report: The Kentucky inventory of mindfulness skills. *Assessment, 11*(3), 191–206. https://doi.org/10.1177/1073191104268029.

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27–45. https://doi.org/10.1177/1073191105283504.

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., Walsh, E., Duggan, D., & Williams, J. M. G. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment, 15*(3), 329–342. https://doi.org/10.1177/1073191107313003.

Barnes, S. M., & Lynn, S. J. (2010). Mindfulness skills and depressive symptoms: A longitudinal study. *Imagination, Cognition and Personality, 30*(1), 77–91. https://doi.org/10.2190/IC.30.1.e.

Bergomi, C., Tschacher, W., & Kupper, Z. (2013). Measuring mindfulness: First steps towards the development of a comprehensive mindfulness scale. *Mindfulness, 4*(1), 18–32. https://doi.org/10.1007/s12671-012-0102-9.

Bernstein, A., Hadash, Y., Lichtash, Y., Tanay, G., Shepherd, K., & Fresco, D. M. (2015). Decentering and related constructs: A critical review and metacognitive processes model. *Perspectives on Psychological Science, 10*(5), 599–617. https://doi.org/10.1177/1745691615594577.

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., et al. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11*(3), 230–241.

Bodhi, B. (2013). What does mindfulness really mean? A canonical perspective. In J. M. G. Williams & J. Kabat-Zinn (Eds.), *Mindfulness: Diverse perspectives on its meaning, origins and applications* (pp. 19–39). Hoboken: Taylor and Francis.

Bolger, N., & Laurenceau, J.-P. (2013). Intensive longitudinal methods: An introduction to diary and experience sampling research. Methodology in the social sciences. New York: Guilford Press.

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822–848. https://doi.org/10.1037/0022-3514.84.4.822.

Carver, C. S., & Scheier, M. F. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychological Review, 97*(1), 19–35.

Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology, 67*(2), 319–333.

Chiesa, A., Calati, R., & Serretti, A. (2011). Does mindfulness training improve cognitive abilities? A systematic review of neuropsychological findings. *Clinical Psychology Review, 31*(3), 449–464. https://doi.org/10.1016/j.cpr.2010.11.003.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01.

Desbordes, G., Gard, T., Hoge, E. A., Hölzel, B. K., Kerr, C., Lazar, S. W., Olendzki, A., & Vago, D. R. (2014). Moving beyond mindfulness: Defining equanimity as an outcome measure in meditation and contemplative research. *Mindfulness, 6*(2), 356–372. https://doi.org/10.1007/s12671-013-0269-8.

Donald, J. N., Atkins, P. W. B., Parker, P. D., Christie, A. M., & Ryan, R. M. (2016). Daily stress and the benefits of mindfulness: Examining the daily and longitudinal relations between present-moment awareness and stress responses. *Journal of Research in Personality, 65*, 30–37. https://doi.org/10.1016/j.jrp.2016.09.002.

Dreyfus, G. (2013). Is mindfulness present-centred and non-judgmental? A discussion of the cognitive dimension of mindfulness. In J. M. G. Williams & J. Kabat-Zinn (Eds.), *Mindfulness: Diverse perspectives on its meaning, origins and applications* (pp. 41–54). Hoboken: Taylor and Francis.

Emmons, R. A., King, L. A., & Sheldon, K. (1993). Goal conflict and the self-regulation of action. In D. M. Wegner & J. W. Pennebaker (Eds.), *Century psychology series. Handbook of mental control* (pp. 528–551). Englewood Cliffs: Prentice-Hall.

Franquesa, A., Cebolla, A., García-Campayo, J., Demarzo, M., Elices, M., Pascual, J. C., & Soler, J. (2017). Meditation practice is associated with a values-oriented life: The mediating role of decentering and mindfulness. *Mindfulness, 8*(5), 1259–1268. https://doi.org/10.1007/s12671-017-0702-5.

Fresco, D. M., Segal, Z. V., Buis, T., & Kennedy, S. (2007). Relationship of posttreatment decentering and cognitive reactivity to relapse in major depression. *Journal of Consulting and Clinical Psychology, 75*(3), 447–455. https://doi.org/10.1037/0022-006X.75.3.447.

Fries, S., Schmid, S., Dietz, F., & Hofer, M. (2005). Conflicting values and their impact on learning. *European Journal of Psychology of Education, 20*, 259–273.

Friese, M., & Hofmann, W. (2016). State mindfulness, self-regulation, and emotional experience in everyday life. *Motivation Science, 2*(1), 1–14. https://doi.org/10.1037/mot0000027.

Galla, B. M. (2016). Within-person changes in mindfulness and self-compassion predict enhanced emotional well-being in healthy, but stressed adolescents. *Journal of Adolescence, 49*, 204–217. https://doi.org/10.1016/j.adolescence.2016.03.016.

Gethin, R. (2013). On some definitions of mindfulness. In J. M. G. Williams & J. Kabat-Zinn (Eds.), *Mindfulness: Diverse perspectives on its meaning, origins, and applications* (pp. 263–279). Hoboken: Taylor and Francis.

Gray, J. A. (1990). Brain systems that mediate both emotion and cognition. *Cognition and Emotion, 4*(3), 269–288. https://doi.org/10.1080/02699939008410799

Gray, J. S., Ozer, D. J., & Rosenthal, R. (2017). Goal conflict and psychological well-being: A meta-analysis. *Journal of Research in Personality, 66*, 27–37. https://doi.org/10.1016/j.jrp.2016.12.003 .

Grossman, P., & van Dam, N. T. (2013). Mindfulness, by any other name: Trials and tribulations of sati in western psychology and science. In J. M. G. Williams & J. Kabat-Zinn (Eds.), *Mindfulness: Diverse perspectives on its meaning, origins, and applications* (pp. 219–239). Hoboken: Taylor and Francis.

Grund, A., & Fries, S. (2012). Motivational interference in study-leisure conflicts: How opportunity costs affect the self-regulation of university students. *Educational Psychology*, 1-24.

Grund, A., & Senker, K. (2018). Motivational foundations of self-control and mindfulness and their role in study-leisure conflicts. *Learning and Individual Differences, 68*, 72–84. https://doi.org/10.1016/j.lindif.2018.10.007.

Grund, A., Brassler, N. K., & Fries, S. (2014). Torn between study and leisure: How motivational conflicts relate to students' academic and social adaption. *Journal of Educational Psychology, 106*(1), 242–257.

Grund, A., Grunschel, C., Bruhn, D., & Fries, S. (2015a). Torn between want and should: An experience-sampling study on motivational conflict, well-being, self-control, and mindfulness. *Motivation and Emotion, 39*(4), 506–520. https://doi.org/10.1007/s11031-015-9476-z.

Grund, A., Schmid, S., & Fries, S. (2015b). Studying against your will: Motivational interference in action. *Contemporary Educational Psychology, 41*, 209–217. https://doi.org/10.1016/j.cedpsych.2015.03.003.

Grund, A., Brassler, N. K., & Fries, S. (2016). The long arm of work: A motivational conflict perspective on teacher strain. *Teaching and Teacher Education, 60*, 153–163. https://doi.org/10.1016/j.tate.2016.08.013.

Grund, A., Fries, S., & Rheinberg, F. (2018). Know Your Preferences: Self-Regulation as Need-Congruent Goal Selection. *Review of General Psychology 22* (4), 437–451. https://doi.org/10.1037/gpr0000159

Hayes, S. C., & Shenk, C. (2004). Operationalizing mindfulness without unnecessary attachments. *Clinical Psychology: Science and Practice, 11*(3), 249–254. https://doi.org/10.1093/clipsy/bph079.

Heidenreich, T., & Michalak, J. (Eds.). (2004*). Achtsamkeit und Akzeptanz in der Psychotherapie. Ein Handbuch.* [Mindfulness and Acceptance in Psychotherapy. A Manual.]Tübingen: DGVT Verlag.

Hofer, M., Schmid, S., Fries, S., Dietz, F., Clausen, M., & Reinders, H. (2007). Individual values, motivational conflicts, and learning for

school. *Learning and Instruction, 17*, 17–28. https://doi.org/10.1016/j.learninstruc.2006.11.003.

Howell, A. J., & Buro, K. (2011). Relations among mindfulness, achievement-related self-regulation, and achievement emotions. *Journal of Happiness Studies, 12*(6), 1007–1022. https://doi.org/10.1007/s10902-010-9241-7.

Janssen, M., Heerkens, Y., Kuijer, W., van der Heijden, B., & Engels, J. (2018). Effects of mindfulness-based stress reduction on employees' mental health: A systematic review. *PLoS One, 13*(1), e0191332. https://doi.org/10.1371/journal.pone.0191332.

Kabat-Zinn, J., Lipworth, L., & Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine, 8*(2), 163–190.

Karelaia, N., & Reb, J. (2015). Improving decision making through mindfulness. In J. Reb & P. W. B. Atkins (Eds.), *Mindfulness in organizations: Foundations, research, and applications* (pp. 163–189). Cambridge: Cambridge University Press.

Keune, P. M., Bostanov, V., Kotchoubey, B., & Hautzinger, M. (2012). Mindfulness versus rumination and behavioral inhibition: A perspective from research on frontal brain asymmetry. *Personality and Individual Differences, 53*(3), 323–328. https://doi.org/10.1016/j.paid.2012.03.034.

Kohls, N., Sauer, S., & Walach, H. (2009). Facets of mindfulness – Results of an online study investigating the Freiburg mindfulness inventory. *Personality and Individual Differences, 46*(2), 224–230. https://doi.org/10.1016/j.paid.2008.10.009.

Kuyken, W., Warren, F. C., Taylor, R. S., Whalley, B., Crane, C., Bondolfi, G., Hayes, R., Huijbers, M., Ma, H., Schweizer, S., Segal, Z., Speckens, A., Teasdale, J. D., van Heeringen, K., Williams, M., Byford, S., Byng, R., & Dalgleish, T. (2016). Efficacy of mindfulness-based cognitive therapy in prevention of depressive relapse: An individual patient data meta-analysis from randomized trials. *JAMA Psychiatry, 73*(6), 565–574. https://doi.org/10.1001/jamapsychiatry.2016.0076.

Langer, W. (2009). Mehrebenenanalyse: Eine Einführung für Forschung und praxis. [multi-level analysis.: An introduction for research and practice]. Wiesbaden: VS Verlag für Sozialwissenschaften.

Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., Shapiro, S., Carmody, J., Abbey, S., & Devins, G. (2006). The Toronto mindfulness scale: Development and validation. *Journal of Clinical Psychology, 62*(12), 1445–1467. https://doi.org/10.1002/jclp.20326.

Michalak, J., Heidenreich, T., Ströhle, G., & Nachtigall, C. (2008). Die deutsche Version der Mindful Attention and Awareness Scale (MAAS): Psychometrische Befunde zu einem Achtsamkeitsfragebogen. [The German version of the Mindful Attention and Awareness Scale (MAAS): Psychometric findings of a mindfulness questionnaire.] Zeitschrift für Klinische Psychologie und Psychotherapie, 37(3), 200–208. doi:https://doi.org/10.1026/1616-3443.37.3.200.

Nezlek, J. B., Holas, P., Rusanowska, M., & Krejtz, I. (2016). Being present in the moment: Event-level relationships between mindfulness and stress, positivity, and importance. *Personality and Individual Differences, 93*, 1–5. https://doi.org/10.1016/j.paid.2015.11.031.

Petrocchi, N., & Ottaviani, C. (2016). Mindfulness facets distinctively predict depressive symptoms after two years: The mediating role of rumination. *Personality and Individual Differences, 93*, 92–96. https://doi.org/10.1016/j.paid.2015.08.017.

Rapgay, L., & Bystrisky, A. (2009). Classical mindfulness: An introduction to its theory and practice for clinical application. *Annals of the New York Academy of Sciences, 1172*, 148–162. https://doi.org/10.1111/j.1749-6632.2009.04405.x.

Riediger, M., & Freund, A. M. (2008). Me against myself: Motivational conflicts and emotional development in adulthood. *Psychology and Aging, 23*(3), 479–494. https://doi.org/10.1037/a0013302.

Rudkin, E., Medvedev, O. N., & Siegert, R. J. (2018). The five-facet mindfulness questionnaire: Why the observing subscale does not predict psychological symptoms. *Mindfulness, 9*(1), 230–242. https://doi.org/10.1007/s12671-017-0766-2.

Safran, J. D., & Segal, Z. V. (1990). Interpersonal process in cognitive therapy. New York: Basic Books.

Salomon, G., & Globerson, T. (1987). Skill may not be enough: The role of mindfulness in learning and transfer. *International Journal of Educational Research, 11*(6), 623–637.

Sauer, S. (2011). Wirkfaktoren von Achtsamkeit: Wirkt Achtsamkeit durch Verringerung der affektiven Reaktivität? Psychologie und Kultur des Bewusstseins: Vol. 3. [factors of mindfulness: Does mindfulness work through a reduction of affective reactivity? Psychology and culture of consciousness] Kröning: Asanger Verlag GmbH.

Sauer, S., Lynch, S., Walach, H., & Kohls, N. (2011a). Dialectics of mindfulness: Implications for western medicine. *Philosophy, Ethics, and Humanities in Medicine, 6*(1), 1–7. https://doi.org/10.1186/1747-5341-6-10.

Sauer, S., Walach, H., & Kohls, N. (2011b). Gray's Behavioural inhibition system as a mediator of mindfulness towards well-being. *Personality and Individual Differences, 50*(4), 506–511. https://doi.org/10.1016/j.paid.2010.11.019.

Schallberger, U. (2005*). Kurzskalen zur Erfassung der Positiven Aktivierung, Negativen Aktivierung und Valenz in Experience Sampling Studien (PANAVA-KS).* [short scales to measure positive activation, negative activation and valence in experience sampling studies (PANAVA-KS). Research reports from the project "quality of experience in work and leisure", 6]. Zürich: Psychologisches Institut der Universität Zürich.

Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology, 62*(3), 373–386. https://doi.org/10.1002/jclp.20237.

Ströhle, G., Nachtigall, C., Michalak, J., & Heidenreich, T. (2010). Die Erfassung von Achtsamkeit als mehrdimensionales Konstrukt. [the measurement of mindfulness as a multidimensional construct.] Zeitschrift für Klinische Psychologie und Psychotherapie, 39(1), 1–12. https://doi.org/10.1026/1616-3443/a000001.

Tanay, G., & Bernstein, A. (2013). State mindfulness scale (SMS): Development and initial validation. *Psychological Assessment, 25*(4), 1286–1299. https://doi.org/10.1037/a0034044.

Tellegen, A., Watson, D., & Clark, L. A. (1999). On the dimensional and hierarchical structure of affect. *Psychological Science, 10*(4), 297–303.

van Dam, N. T., van Vugt, M. K., Vago, D. R., Schmalzl, L., Saron, C. D., Olendzki, A., Meissner, T., Lazar, S. W., Kerr, C. E., Gorchov, J., Fox, K. C. R., Field, B. A., Britton, W. B., Brefczynski-Lewis, J. A., & Meyer, D. E. (2018). Mind the hype: A critical evaluation and prescriptive agenda for research on mindfulness and meditation. *Perspectives on Psychological Science: A Journal of the Association for Psychological Science, 13*(1), 36–61. https://doi.org/10.1177/1745691617709589.

Waters, L., Barsky, A., Ridd, A., & Allen, K. (2015). Contemplative education: A systematic, evidence-based review of the effect of meditation interventions in schools. *Educational Psychology Review, 27*(1), 103–134. https://doi.org/10.1007/s10648-014-9258-2.

Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin, 98*, 219–235. https://doi.org/10.1037/0033-2909.98.2.219.

Watson, D., Wiese, D., Vaidya, J., & Tellegen, A. (1999). The two general activation systems of affect: Structural findings, evolutionary considerations, and psychobiological evidence. *Journal of Personality and Social Psychology, 76*(5), 820–838. https://doi.org/10.1037/0022-3514.76.5.820.

Zimmerman, B. J., & Schunk, D. H. (2011). Self-regulated learning and performance: An introduction and an overview. In B. J. Zimmerman & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 1–12). New York: Routledge.