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State Mindfulness, Self-Regulation, and Emotional Experience in Everyday Life

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Mindfulness is associated with a host of beneficial outcomes. Increasing evidence has suggested that mindfulness may support adaptive self-regulation. The present research investigates fluctuations in state mindfulness in everyday life and links these with desire experiences and self-regulation. When high in state mindfulness, participants experienced less conflict between desires and other goals, tried to resist desires less, and enacted desires to a greater extent than when less mindful. This was accompanied by less use of self-regulatory strategies, including suppression, self-stopping, distraction, and avoidance. In addition, state mindfulness was associated with greater happiness, less guilt, and less regret after enacting desires. It is important to note that when conflict between desires and other goals was high, participants exerted as much restraint when reporting low as when reporting high state mindfulness. These findings suggest that state mindfulness goes along with wise self-regulation as opposed to strictly higher restraint: enjoying the benefits of indulgence without risking important long-term goals.

Keywords: mindfulness, self-regulation, desires, conflict, emotional experience

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The psychological study of mindfulness has witnessed a rare surge in interest in recent years that has spanned many subdisciplines of psychology. The picture that emerges from this literature is that mindfulness is associated with an impressive array of positive outcomes while at also bearing hardly any unwanted effects on emotions and behavior (Brown, Ryan, & Creswell, 2007; Grossman, Niemann, Schmidt, & Walach, 2004).

Mindfulness is characterized by a pronounced awareness of one's moment-to-moment experiences in a nonjudgmental and accepting way (Bishop et al., 2004; Kabat-Zinn, 1994). Inner feelings, behavior, and surrounding stimuli are clearly and attentively experienced with an accepting attitude, without an agenda to modify or control them. Due to the better access to inner processes, mindful persons are better able to describe their inner experiences without being overwhelmed by and acting impulsively on them (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Mindfulness can be trained, but it also varies both as a stable trait between persons and as a state within persons over time (Brown & Ryan, 2003).

Several strands of research have implicated mindfulness in both successful self-regulation and psychological well-being (Grossman et al., 2004; Ostafin, Robinson, & Meier, 2015). The capacity to exert control over one's impulses, emotions, and other dominant responses is associated with a host of beneficial outcomes in life (Moffitt et al., 2011; Tangney, Baumeister, & Boone, 2004). By contrast, being swayed by momentary desires may lead to not only unhealthy and risky behavior but also self-defeating emotions such as guilt and regret (Hofmann & Fisher, 2012; Lewis, 2010). Increasing work has suggested that mindfulness may predispose individuals to adaptive emotion

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regulation in stressful situations (Brown et al., 2007; Weinstein, Brown, & Ryan, 2009). Of importance, restraint is not a goal in itself and can even be detrimental (Polivy, 1998). Rather, flexibly and adaptively dealing with temptations, balancing short- and long-term goals, appears desirable. The present study contributes to a deeper understanding of the effects of mindfulness in everyday life by investigating how within-person fluctuations in mindfulness are related to self-regulatory processes such as restraint versus indulgence and associated emotional experiences.

Mindfulness, Emotional Experience, and Self-Regulation

Abundant research has implicated mindfulness in superior emotion regulation and psychological well-being. Trait mindfulness is positively associated with life satisfaction, self-esteem, and positive affect (Brown & Ryan, 2003) and negatively associated with depression and rumination (Baer et al., 2006). Trait and state mindfulness are independently associated with lower levels of negative affect in daily life (Brown & Ryan, 2003). These associations may be partly due to greater emotional stability (Hill & Updegraff, 2012), more-adaptive responding to negative events (Arch & Craske, 2006), and to more-adaptive regulation of stress: Mindful individuals tend to perceive difficult situations as less stressful and use more-adaptive coping strategies in response to stress that benefit well-being (Weinstein et al., 2009).

More related to restraint, trait mindfulness is negatively associated with impulsivity, which predisposes people to act without reflection on the basis of momentary feelings (Peters, Erisman, Upton, Baer, & Roemer, 2011). Consistent with this, dispositional mindfulness is associated with reduced aggressiveness, whereas state mindfulness predicts less-aggressive behavior in response to social rejection (Heppner et al., 2008). These effects may partially be due to reduced rumination, which in turn reduces aggression (Borders, Earleywine, & Jajodia, 2010).

Arguably one of the domains most pertinent to the issue of self-regulatory conflict is the domain of eating. Some investigations have found both state and trait mindfulness to be related to healthier eating (Jordan, Wang, Donatoni, & Meier, 2014). This beneficial effect may be partly due to an increased responsiveness to physiological cues following food intake (Van de Veer, Van Herpen, & Van Trijp, 2015). In the general population, mindfulness is related to a more-constant body weight (Van de Veer et al., 2015). A recent review of the literature has suggested that mindfulness trainings change the quality of eating in that they decrease binge eating and emotional eating in populations that engage in these behaviors (Katterman, Kleinman, Hood, Nackers, & Corsica, 2014). Evidence for effects on weight change was mixed. More and better powered studies with long-term follow-ups on weight development are needed.

Does Mindfulness Necessarily Bolster Self-Regulation?

How may the various facets of mindfulness impact on self-regulatory behavior? Some of these aspects, such as nonreactivity to inner experiences or acting with awareness (i.e., the opposite of acting on autopilot), seem to clearly favor restraint. For other mindfulness facets, the argument is more complex. For example, a core element of mindfulness is an increased awareness of inner experiences such as emotions, desires, and urges (Baer et al., 2006; Bishop et al., 2004). From a self-regulatory perspective, however, it is conceivable that a particularly clear representation of how much one is tempted by a delicious desert, a cigarette, or a drink may actually make it more difficult, not easier, to withstand the temptation (Kavanagh, Andrade, & May, 2005). Self-restraint will likely be tougher the more attention is directed at the emotionally hot aspects that favor indulgence and hamper restraint (Metcalfe & Mischel, 1999).

An accepting and nonjudgmental attitude toward one's inner experiences is another central feature of mindfulness (Baer et al., 2006; Bishop et al., 2004). It has been argued that acceptance fosters self-regulation by helping to give up a goal to control emotional states (Ostafin, 2015). However, accepting and not judging inner experiences such as desires and impulses may also make self-regulation more difficult, not easier. The more accepting and nonjudgmental individuals are of their inner tendencies, the less likely they experience conflict between these experiences and other goals.

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Conflict signals that something is not okay, not running the way it should be. Acceptance means that an experience is okay. A cornerstone for successful self-regulation is the detection of conflicts between a current state and a goal state (Carver & Scheier, 1998). Thus, an accepting and nonjudgmental attitude may undermine restraint to the extent that the accepting and nonjudgmental attitude toward desires and urges impedes the experience of conflict that would otherwise trigger control processes aimed at regulating these inner tendencies.

Sporadic evidence has delivered support for the assumption that mindfulness may not always be associated with more restraint. For example, one study found trait mindfulness to be positively associated with smoking and binge drinking (Leigh, Bowen, & Marlatt, 2005). In a study on cigarette craving, smokers who had been instructed to accept their smoking-related emotions reported increased, rather than decreased, cravings (Szasz, Szentagotai, & Hofmann, 2012).

In the domain of eating, participants engaging in a brief mindfulness intervention focusing on acceptance of feelings aimed at reducing chocolate consumption ate descriptively more, not less, chocolate in the following week (Jenkins & Tapper, 2014). A different mindfulness intervention aimed at reducing chocolate consumption led to increased chocolate cravings and no reduced consumption during the week after the intervention (but less consumption in a laboratory taste test; Hooper, Sandoz, Ashton, Clarke, & McHugh, 2012). In a similar vein, a brief acceptance-based experimental manipulation increased food cravings in the course of the study (Alberts, Thewissen, & Middelweerd, 2013). These findings may partly explain why evidence of mindfulness trainings on weight change is mixed to date (Katterman et al., 2014). In light of more-successful attempts to reduce food cravings with 7- to 8-week-long acceptance-based trainings (e.g., Alberts, Mulkens, Smeets, & Thewissen, 2010), Alberts and colleagues (2013) speculated that acceptance may be counterproductive in the short term but effective in the long term in the context of extensive training programs. This would imply that without such a training program, acceptance in a given moment may lead to increased craving and increased chances of indulgence instead of restraint.

Taken together, mindfulness appears consistently associated with less experienced negative affect, better emotion regulation, and increased well-being. Some evidence has suggested that mindfulness enables better restraint (see earlier discussion), although this relationship does not appear completely robust. A theoretical analysis presented here suggests that greater acceptance of desires and urges may temper experienced conflict with other goals and make people more inclined to give in to their temptations. Thus, when mindful, people may not be less capable, but rather less motivated, to restrain themselves. However, if motivation to restrain is high, mindful people should be able to restrain themselves just as much as when being less mindful.

The Present Research

The present study investigated the relation between mindfulness and self-regulation in everyday life. Using experience sampling methodology (Mehl & Conner, 2012), we had participants report on their momentary state of mindfulness, how they dealt with experienced desires, and on their corresponding emotional experiences several times a day for 1 week.

We sought to shed light on two interrelated questions. First, we investigated the relation between state mindfulness and experienced conflicts between desires and other goals. We expected mindfulness to be associated with the experience of less-pronounced conflicts, weaker attempts to control desires, and more enactment of desires. Second, we investigated the relation of state mindfulness with emotional experience associated with self-regulatory behavior. More specifically, we explored the possibility that mindfulness may be related to more-positive and less-negative emotional experiences in response to handling a desire.

Method

Participants

Participants were recruited via university mailing lists and various publicly available websites and were asked to participate in a study on everyday desires. Eligibility criteria were owning a smartphone, being older than 18 years of age, residing in the United States or Canada, and being fluent in English. Partici-

pants were informed that they could earn up to US$30 worth of credits for a popular Internet store; $5 for completing an initial intake survey, and up to another $25 for responding to at least 35 out of 49 brief mobile surveys. We included all participants who completed at least five mobile surveys and reported at least five desires over the course of the study. The final sample included 101 participants between 19 and 62 years of age (M = 36.12, SD = 12.73; 65 female, 26 male).[1] Most participants where Caucasian (72.5%), 9.9% were African American, 9.9% were American Indian or Alaskan Native, and 7.7% of participants indicated a different ethnicity. Almost all participants reported having completed high school (98.9%), and about two thirds (67.1%) had completed college. The study was approved by the institutional review board of the University of Chicago.

Procedure

Upon opening the central study website, participants learned that the study was about how people experience and deal with everyday desires. They read an overview of the study, information about compensation, and eligibility requirements. Interested participants were checked for eligibility and completed a brief compatibility check for their smartphone. After registering for the study, participants completed an intake survey including demographic information and several personality questionnaires, among them a measure of trait mindfulness, that lasted approximately 30 min. A complete list of assessed variables is available upon request. The next day, the experience sampling phase began. For seven consecutive days participants received seven text messages per day, each including a link to a brief survey (see the following section on the experience sampling procedure). After the experience sampling phase, participants received an e-mail in which they were thanked for taking part in the study. They received an online coupon for the Internet store as compensation for their efforts.

Experience Sampling Procedure

Participants received a text message including a link to a brief survey. Each survey started with the assessment of state mindfulness (see Figure 1). Participants then indicated whether they were currently or recently (within the last 30 min) experiencing a desire. If they indicated no desire, they were asked for their momentary happiness, and the survey was over. If they indicated that they did experience a current or recent desire, they next indicated the domain the desire stemmed from on a list of 16 domains (Hofmann, Baumeister, Förster, & Vohs, 2012). They also reported on the desire's strength, whether the desire stood in conflict to other goals, and to what extent they tried to resist the desire. If they indicated that they did not try to resist the desire at all, they were asked about the degree to which they enacted the desire. If they indicated that they tried to resist the desire at least to some extent, they were asked about the degree to which they engaged in several self-regulatory strategies before indicating to which degree they enacted the desire. Finally, participants who indicated that they did not enact the desire at all were asked about their momentary happiness, experienced pride, and experienced regret about not enacting the desire. By contrast, participants who indicated that they enacted the desire at least to some extent were asked about their momentary happiness, experienced guilt, and experienced regret about enacting the desire. Figure 1 provides an overview of the key measures in the survey flow.

Text messages were spread across a 14-hr time frame between 8 a.m. and 10 p.m. One message was sent within each of seven 2-hr blocks with the constraint that two messages were always separated by at least 30 min (Hektner, Schmidt, & Csikszentmihalyi, 2007). If the smartphone was turned off during the time of a signal, the program postponed the signal until later in the time block. If the time block passed without the smartphone being turned back on, the response was logged as missing. If the smartphone was turned on but the participant did not respond within 15 min, the response was logged as missing as well. On a small fraction of occasions (3.3%), participants clicked on a previously used link another time to complete a

[1] Due to a technical error, data from the intake session including demographic information and trait mindfulness were recorded for only 91 of the 101 participants. All analyses including demographic information and/or trait mindfulness therefore include only the subsample of 91 instead the full sample of 101 participants.

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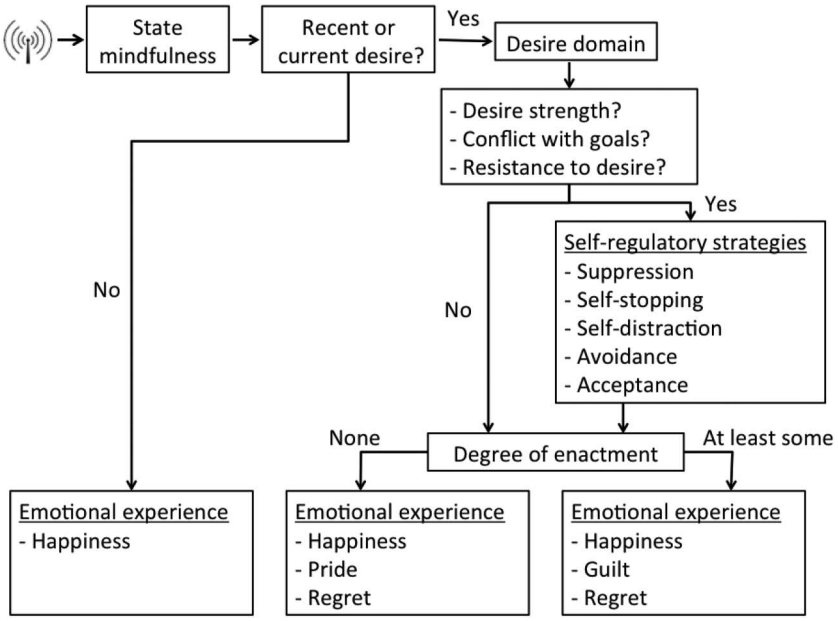

Figure 1. Flow of the mobile surveys during the experience sampling phase. Participants reported on their state mindfulness, whether they were currently or recently experiencing a desire, and their current emotional experience. If they experienced a desire, they reported the desire's domain, its strength, how much it conflicted with other goals, their attempts to resist the desire, and the degree to which they enacted the desire, before reporting on their emotional experience. Participants who indicated they had tried to resist the desire at least to some extent additionally reported on the degree to which they had engaged in several self-regulatory strategies.

brief survey. The median delay between the initial and the subsequent response was 1.39 hr.

Measures

Trait mindfulness. During the intake session, participants completed the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006), a comprehensive and well-validated scale to assess trait mindfulness. The scale assesses five interrelated, but distinct, facets of mindfulness: nonreactivity to inner experiences, observing inner experiences, describing with words, acting with awareness, and nonjudging of inner experiences. Sample items include "Usually when I have distressing thoughts or images, I just notice them and let them go" (nonreactivity to inner experiences), "I pay attention to sensations, such as the wind in my hair or sun on my face" (observing inner experiences), "I find myself doing things without paying attention" (acting with awareness, reverse-scored), "I'm good at finding the words to describe my feelings" (describing with words), and "I tell myself I shouldn't be thinking the way I'm thinking" (nonjudging of inner experiences). The average of all items served as indicator of trait mindfulness (Cronbach's alpha = .91).

State mindfulness. There is no published state mindfulness inventory to assesses the five mindfulness facets included in the FFMQ that we used to assess trait mindfulness. To include a state mindfulness assessment in each brief experience sampling survey, we aimed at including an indicator for each facet while also keeping the assessment as brief as possible. To this end, we took the short form of the FFMQ (Bohlmeijer, ten Klooster, Fledderus, Veehof, & Baer, 2011); chose one item with high factor loadings for each facet; and adapted these items so that they assessed acute, momentary tendencies instead of dispositional trait concepts. This resulted in a scale of five items: "Right now, when I have distressing thoughts or images, I

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just notice them and let them go" (nonreactivity); "Right now, I pay attention to my physical experiences" (observing); "Right now, I find myself doing things without paying attention" (acting with awareness); "Right now, I am good at finding words to describe my feelings" (describing); and "Right now, I tell myself that I shouldn't be thinking the way I am thinking" (nonjudging). Reliability of this scale was acceptable given the breadth of the assessed construct and the small number of items (Cronbach's alpha = .66).

Dealing with desires. Participants indicated (a) how strong the desire was at its peak (desire strength) on a 7-point scale ranging from 0 (*very weak*) to 6 (*very strong*), (b) how much this desire was in conflict with other important goals (conflict) on a scale ranging from 0 (*not at all*) to 6 (*very much*), (c) how much they tried to resist the desire (resistance) on a scale ranging from 0 (*not at all*) to 6 (*very much*), and (d) to what extent they satisfied their desire (enactment) on a scale ranging from 0 (*not at all*) to 6 (*totally;* cf. Hofmann, Baumeister, et al., 2012).

Self-regulatory strategies. Participants who indicated that they had tried to resist the desire at least somewhat were asked to what extent they had made use of the following self-regulatory strategies: (a) suppression of thoughts and feelings about the desire; (b) self-stopping from doing what they were about to do; (c) distracting themselves with something else; (d) accepting the desire for what it was but not enacting it; and (e) avoiding the things, people, and situations that gave rise to the desire. Each was answered on a scale ranging from 0 (*did not use this at all*) to 6 (*used this a lot*).

Emotional experience. Participants who indicated that they did not currently or recently experience a desire were asked how happy they currently felt on a scale ranging from −3 (*very unhappy*) to +3 (*very happy*). Participants who indicated that they experienced a desire but did not at all enact it reported how happy they felt, how proud they felt about not having enacted the desire on a scale ranging from 0 (*not at all*) to 6 (*very much*), and how much they regretted not having enacted the desire on a scale ranging from −3 (*not at all*) to +3 (*very much*). Finally, participants who indicated that they experienced a desire and enacted the desire at least to some extent reported how happy they felt, how guilty they felt about having enacted the desire on a scale ranging from 0 (*not at all guilty*) to 6 (*very guilty*), and how much they regretted having enacted the desire on a scale ranging from 0 (*not at all*) to 6 (*very much*).

Data analysis strategy. Experience-sampling data are nested within persons. To investigate how within-person variations in state mindfulness were associated with the strength of experienced desires, conflict with other goals, resistance to the desire, and desire enactment, we ran several multilevel regression models using SPSS 22. Multilevel modeling is a powerful statistical analysis method due to the numerous repeated measurement occasions within persons that increase statistical power (Maas & Hox, 2005). Dependent variables were left in their original metric. Level 1 predictors (e.g., within-person variations in state mindfulness) were person-mean-centered in order to estimate the unbiased strength of relationships at Level 1 (Enders & Tofighi, 2007). The Level 2 predictor trait mindfulness was grand-mean-centered.

We first performed several descriptive analyses on the raw data. Next, we ran multilevel models to replicate basic relations between desire strength, conflict, resistance, and enactment found in previous research (Hofmann, Baumeister, et al., 2012). Moving on to the central analyses, each base model component was predicted by state mindfulness. We also tested whether state mindfulness moderated the associations between base model components. Finally, self-regulatory strategies and emotional experience served as dependent variables predicted by state mindfulness. Each of these steps was repeated for state mindfulness while controlling for trait mindfulness to investigate whether within-person fluctuations in state mindfulness add incremental value beyond stable between-persons differences.

Level 1 predictor effects were treated as fixed (indicating a similarly strong relationship across persons) unless analyses revealed significant random variance components (indicating individual differences in the strength of the relationship). A random intercept was included in all models. If a given predictor variable showed a significant random variance component ($p < .05$), its effect was kept as random in the model; otherwise, it was treated as a fixed effect (Hox, 2010). We report unstandardized regression weights, which can be interpreted as the in-

crease in the dependent variable for every one-unit increase in the independent variable. We additionally ran all models reported in the main analyses section with an autoregressor included to control for the possibility that occasions that are closer together in time correlate more highly than do occasions that are further apart. This did not meaningfully change any of the reported results. In particular, all effects of state mindfulness that were significant without the autoregressor remained significant and vice versa.

Results

Preliminary Analyses

On average, participants responded to 31.83 (N = 3,215, SD = 10.75, range = 7–49) out of a maximum of 49 brief surveys, for a response rate of 64.96%. In total, participants reported 1,473 desires (45.82% of all responses). Mean reported state mindfulness per person was fairly high 4.08 (SD = .81, range = .80–5.89). Mean trait mindfulness was 3.57 (SD = .53, range = 2.18–4.74). Neither the person mean of state mindfulness reports nor trait mindfulness was significantly correlated with the likelihood of reporting a desire ($r_{mean\_state} = -.08$, $p = .435$; $r_{trait} = -.08$, $p = .438$).

We ran an unconditional means multilevel model to estimate the proportion of variability in state mindfulness reports that exists between Level 1 (within-person) and Level 2 (between-persons) units. The estimated grand mean was 4.08 (see the previous paragraph) and variance components suggested statistically significant variability at the between-persons (0.61) and the within-person (0.62) levels. The intraclass correlation was computed as [.61/(.61 + .62)] = .50. Thus, 50% of the total variance in state mindfulness reports can be attributed to between-persons differences, and 50% can be attributed to within-person variability, respectively. This suggests that considering within-person variations in state mindfulness offers great potential to explain outcomes associated with mindfulness.

The mean of all state mindfulness reports per person can be viewed as an alternative indicator of trait mindfulness. Indeed, individual means of state mindfulness reports were highly correlated with the trait mindfulness score (r = .58, $p < .001$). This relationship lends validity to our state mindfulness assessment. Most important, this analysis of between-persons differences is mute with regard to the within-person variations in state mindfulness and their relationship to other relevant variables.

Table 1 provides descriptive statistics and correlations of the main variables. Note that for this analysis we averaged the repeated responses for all repeatedly measured variables within persons and used these person means for the analysis. Because the present article focuses on within-person fluctuations of these variables that are obliterated when calculating person means, these correlations are not of focal interest here and should be interpreted in the context of the main analyses reported later.

Table S1 in the online supplemental material provides an overview of the relative frequencies of reported desire domains. Eating-related desires were most frequently reported, followed by sleep- or rest-related desires and media-related desires. Overall, the distribution of relative frequencies across the desire domains reasonably resembles earlier findings (Hofmann, Vohs, & Baumeister, 2012).

To set the stage for the main analyses, we conceptually replicated the multilevel base model relationships between desire strength, conflict, resistance, and behavioral enactment reported by Hofmann and colleagues (2012; see also Figure 2). As expected, desire strength and experienced conflict independently predicted behavioral enactment. Stronger desires were enacted to a greater degree than weaker desires (b = .24, 95% confidence interval [CI: .12, .36], SE = .06), $t(1361.11) = 3.91$, $p < .001$, and greater conflict was associated with lower enactment ($b = -.33$, 95% CI [−.39, −.27], SE = .03), $t(1360.70) = -10.43$, $p < .001$. In addition, greater conflict predicted greater resistance (b = .50, 95% CI [.44, .56], SE = .03), $t(82.68) = 15.55$, $p < .001$, and greater resistance was in turn associated with reduced enactment ($b = -.64$, 95% CI [−.71, −.57], SE = .04), $t(68.70) = -17.74$, $p < .001$. When resistance was included in the model of desire strength and conflict predicting enactment, the direct effect of conflict on enactment became nonsignificant ($b = -.01$, 95% CI [−.07, .06], SE = .03), $t(1358.32) = -0.25$, $p = .805$, with resistance remaining a highly significant predictor ($b = -.63$, 95% CI [−.70, −.56], SE = .03), $t(1358.06) = -18.34$, $p < .001$, indicating mediation by resistance.

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Table 1
Descriptive Statistics and Zero-Order Correlations of the Main Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Mindfulness																		
1. Trait mindfulness[a]	—																	
2. State mindfulness	.58***	—																
Dealing with desires																		
3. Desire strength	.07	.07	—															
4. Conflict	−.15	−.33**	.37***	—														
5. Resistance	−.12	−.24*	.38***	.72***	—													
6. Enactment	.17	.28**	.09	−.31**	−.48***	—												
Self-regulatory strategies																		
7. Suppression	−.24*	−.21*	.44***	.40***	.63***	−.26**	—											
8. Self-stopping	−.21*	−.20*	.45***	.56***	.74***	−.23*	.77***	—										
9. Distraction	−.36***	−.28**	.43***	.46***	.63***	−.30**	.75***	.66***	—									
10. Acceptance	.14	.07	.20*	.30**	.51***	−.43***	.46***	.51***	.26**	—								
11. Avoidance	−.20	−.26*	.36***	.37***	.53***	−.15	.63***	.73***	.56***	.47***	—							
Emotional experience																		
12. Happiness (no desire)	.29**	.48***	.22*	−.20*	−.08	.23*	−.01	.00	−.06	−.01	−.03	—						
13. Happiness (desire not enacted)[b]	.21	.39***	−.16	−.29**	−.23*	.13	−.18	−.13	−.26*	−.01	−.25*	.66***	—					
14. Pride (desire not enacted)[b]	.06	.07	.22*	.40***	.30**	.20	.29**	.47***	.23*	.15	.24*	.17	.27*	—				
15. Regret (desire not enacted)[b]	−.07	−.04	.13	.14	.25*	−.03	.25*	.36***	.23*	.01	.32**	.15	.09	.13	—			
16. Happiness (desire enacted)	.22*	.39***	.30**	−.38***	−.32**	.32**	−.03	−.15	−.09	−.12	−.10	.51***	.18	−.13	−.08	—		
17. Guilt (desire enacted)	−.24*	−.42***	.28**	.64***	.54***	−.02	.36***	.52***	.41***	.07	.39***	−.17	−.20	.37***	.31**	−.31**	—	
18. Regret (desire enacted)	−.24*	−.40***	.33***	.73***	.56***	−.11	.30**	.56***	.36***	.13	.41***	−.22*	−.25*	.35***	.29**	−.43***	.83***	—
M	3.57	4.07	4.47	2.27	2.23	3.15	2.52	2.42	2.90	3.06	1.59	1.17	.49	2.43	−.39	1.16	1.42	1.25
SD	.53	.81	.75	1.26	1.13	1.24	1.32	1.26	1.45	1.27	1.27	.89	1.10	1.52	1.27	.86	1.09	1.12

Note. $N = 101$. All variables except trait mindfulness are within-person means.
[a] $N = 91$. [b] $N = 87$.
* $p < .05$. ** $p < .01$. *** $p < .001$.

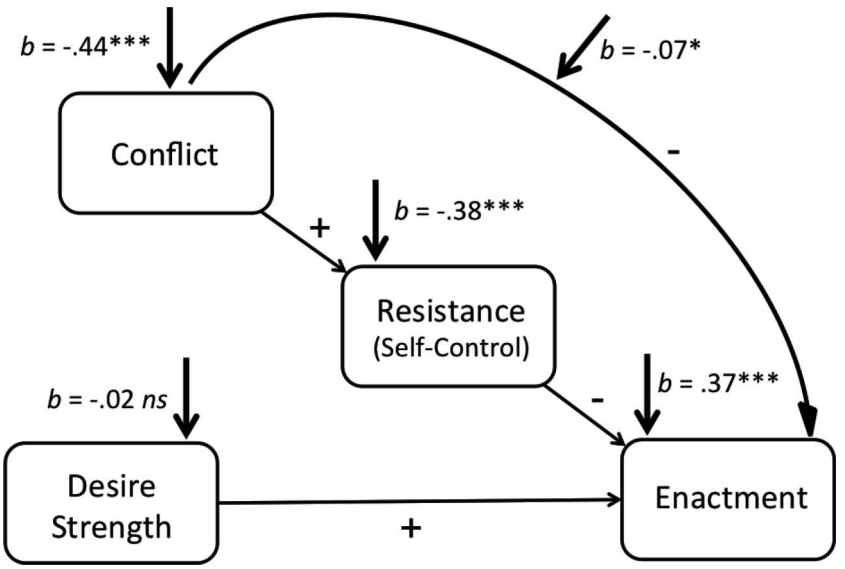

Figure 2. Effects of state mindfulness on base model components. More-pronounced state mindfulness was associated with less perceived conflict between the desire and other goals, less resistance, and more enactment of the desire. Perceived conflict led to less enactment particularly when state mindfulness was high. Base model relationships were conceptually replicated from Hofmann, Baumeister, Förster, and Vohs (2012): Greater desire strength was associated with greater enactment of the desire. Greater perceived conflict predicted greater resistance to the desire, which then predicted less enactment. b = unstandardized regression weight in multilevel regression analyses. * $p < .05$. *** $p < .001$.

Main Analyses

State mindfulness and base model components. To test the first main hypothesis, that mindfulness is associated with less conflict and ultimately more enactment, we tested the relationship of state mindfulness with each of the base model components in a series of multilevel analyses. State mindfulness was unrelated to desire strength ($b = -.02$, 95% CI [−.08, .05], $SE = .03$), $t(1387.12) = -0.50$, $p = .618$. As expected, there was a strong negative relationship between mindfulness and experienced conflict between desires and other goals ($b = -.44$, 95% CI [−.57, −.32], $SE = .06$), $t(1397.18) = -7.12$, $p < .001$. Consequently, mindfulness was also associated with less resistance ($b = -.38$, 95% CI [−.50, −.26], $SE = .06$), $t(1391.90) = -6.15$, $p < .001$. Given this, it followed that mindfulness was also associated with more behavioral enactment of desires ($b = .37$, 95% CI [.22, .52], $SE = .08$), $t(1396.66) = 4.88$, $p < .001$ (see Figure 2).

Next, we tested for a moderating role of state mindfulness on any of the base model pathways just reported. Mindfulness moderated the pathway between experienced conflict and behavioral enactment ($b = -.07$, 95% CI [−.15, .00], $SE = .04$), $t(1421.75) = -1.98$, $p = .048$. As Figure 3 illustrates, the generally greater probability of enacting a desire when higher in state mindfulness was particularly pronounced at low degrees of perceived conflict. There was no difference between lower and higher state mindfulness in terms of behavioral enactment when perceived conflict was strong. Follow-up analyses revealed that this moderation effect was due to mindfulness moderating the link between conflict and resistance ($b = .05$, 95% CI [.00, .11], $SE = .04$), $t(1400.42) = 2.12$, $p = .034$. At higher degrees of perceived conflict, resistance was just as great when being mindful as when being less mindful. Mindfulness did not moderate the link between resistance and enactment ($b = -.02$, 95% CI [−.09, .05], $SE = .03$), $t(1409.26) = -0.60$, $p = .547$. If people tried to

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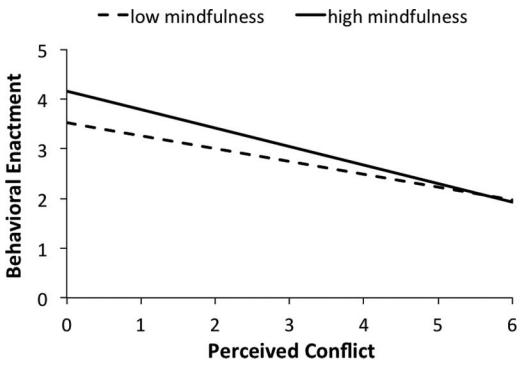

Figure 3. State mindfulness moderated the relationship between conflict and enactment. In general, higher state mindfulness was associated with more behavioral enactment of desires. However, when perceived conflict between a desire and other goals was strong, there was no longer a difference between lower and higher state mindfulness. State mindfulness was estimated at 1 *SD* above or below the mean.

resist their desires, they were fairly successful, whether they were presently mindful or not.

Finally, we repeated all analyses involving state mindfulness while controlling for trait mindfulness as indicated by the FFMQ. All significant effects of state mindfulness remained significant, and all nonsignificant effects remained nonsignificant. For analyses focusing exclusively on trait mindfulness, please see the online supplemental material.

State mindfulness and self-regulatory strategies. State mindfulness was associated with four of the five common self-regulatory strategies people use to resist desires. Consistent with the findings on conflict, resistance, and enactment, when higher in state mindfulness participants tried to suppress thoughts and feelings about the desire less ($b = -.17$, 95% CI [−.31, −.03], $SE = .07$), $t(905.32) = -2.37$, $p = .019$; tried to stop themselves from what they were about to do less ($b = -.34$, 95% CI [−.49, −.20], $SE = .08$), $t(912.02) = -4.53$, $p < .001$; tended to try to distract themselves less ($b = -.14$, 95% CI [−.29, .01], $SE = .08$), $t(902.50) = -1.85$, $p = .065$; and tried to avoid the things, people, and situations that gave rise to the desire less ($b = -.28$, 95% CI [−.42, −.15], $SE = .07$), $t(903.03) = -4.23$, $p < .001$, compared to situations in which they scored lower on state mindfulness. There was no effect on acceptance ($b = .07$, 95% CI [−.09, .23], $SE = .08$), $t(917.14) = 0.89$, $p = .373$. We come back to this surprising latter finding in the Discussion section.

Finally, when the analyses involving state mindfulness were repeated controlling for trait mindfulness, all initially significant state mindfulness effects remained significant and all nonsignificant effects remained nonsignificant. For analyses focusing exclusively on trait mindfulness, please see the online supplemental material.

State mindfulness and emotional experience. In all instances in which participants indicated that they did not currently or recently experience a desire they were asked for their momentary happiness (see Figure 1). These situations comprised 54.2% of all contacts, thus representing baseline conditions. In these situations, there was a strong positive relationship between state mindfulness and happiness ($b = .61$, 95% CI [.51; .72], $SE = .05$), $t(70.86) = 11.92$, $p < .001$.

After a desire was enacted, mindfulness was also positively associated with happiness ($b = .55$, 95% CI [.45, 65], $SE = .05$), $t(952.13) = 10.59$, $p < .001$. In addition, when high in state mindfulness participants experienced less guilt ($b = -.45$, 95% CI [−.57, −.33], $SE = .06$), $t(945.42) = -7.49$, $p < .001$, and less regret about having enacted the desire ($b = -.41$, 95% CI [−.52, −.30], $SE = .06$), $t(939.11) = -7.29$, $p < .001$. After experiencing a desire, but not enacting it, participants were also happier when high in state mindfulness ($b = .65$, 95% CI [.50, .79], $SE = .07$), $t(404.22) = 8.76$, $p < .001$. State mindfulness was not associated with regret after not enacting a desire ($b = -.18$, 95% CI [−.41, .05], $SE = .12$), $t(434.05) = -1.51$, $p = .131$, or with pride after not enacting a desire ($b = .05$, 95% CI [−.16, 27], $SE = .11$), $t(405.89) = 0.47$, $p = .640$.

When these analyses were repeated controlling for trait mindfulness, all initially significant state mindfulness effects remained significant and all nonsignificant effects remained nonsignificant. For analyses focusing exclusively on trait mindfulness, please see the online supplemental material. Also in the online supplemental material, we report additional analyses focusing on emotional experiences after self-regulatory success versus failure by including resistance to a desire and its interaction with state mindfulness in the models.

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Discussion

Mindfulness is associated with an impressive array of desirable outcomes. The present study is the first to link state fluctuations in mindfulness with the self-regulation of desires and associated emotional experiences in everyday life. The study makes three major contributions. First, the present findings suggest that when higher in state mindfulness, people generally handle their desire more leniently. Participants reported similarly strong desires compared to being less mindful, but they experienced less conflict between their desires and other goals, tried to resist their desires less, and ended up indulging in their desires to a greater extent. Follow-up analyses revealed that the weaker overall resistance was reflected in less use of various self-regulatory strategies including suppression of thoughts and feelings about the desire; self-stopping; distraction; and avoidance of things, people and situations that gave rise to the desire. Second, higher state mindfulness was associated with greater happiness in general, after resisting a desire, and also after enacting a desire. In addition, after enacting a desire, participants experienced less guilt and less regret when high in state mindfulness. Thus, when higher in state mindfulness, participants leaned toward less-negative self-appraisals after enacting a desire. Additional analyses reported in the online supplemental material suggest that these relationships largely held even after trying to resist but still enacting a desire (i.e., after self-regulatory failure). These findings fit well with extant work showing negative relationships between mindfulness and negative affect and positive relationships with subjective well-being (Brown & Ryan, 2003).

The third major contribution of the present study is the observation that despite the generally more-lenient handling of desires, greater indulgence was not inevitable when being mindful. When a desire strongly conflicted with other goals—arguably those situations that bear the greatest risk for serious damage to long-term goals—mindful participants resisted just as much and enacted their momentary desires just as little as when being less mindful. Thus, when mindful, people showed wise self-regulation and managed to combine the best of two worlds. On one hand, they harnessed the short-term benefits entailed in the enactment of desires such as enjoyment and pleasure without beating themselves up about the indulgence. On the other hand, they successfully restrained themselves to not endanger important long-term goals when the stakes were high, thereby avoiding the potential downsides of giving in to the allure of the moment. Said differently, when mindful, participants made use of their self-regulatory abilities in a wise and flexible manner—reaping happiness from short-term indulgence when it was unproblematic to do so and knowing when to stop and restrain themselves when long-term goals made it necessary.

The present study used an experience sampling approach that allowed focusing on within-person fluctuations in state mindfulness in everyday life. There was a substantial relationship between participants' average state mindfulness and a well-validated indicator of trait mindfulness (Baer et al., 2006), lending credibility to the state mindfulness assessment. Despite this overlap, the findings related to state mindfulness largely remained stable when controlling for differences in trait mindfulness. This indicates that within-person fluctuations of mindfulness are a unique contributor beyond stable between-persons differences in explaining self-regulatory behavior in everyday life.

Why Does Mindfulness Not Always Benefit Restraint?

How can one reconcile the evidence that mindfulness is associated with better self-regulatory abilities such as executive functioning that allow for successful restraint (for a review, see Gallant, 2016) but, in the present data, state mindfulness was generally associated with less restraint? We believe that the present findings do not stand in opposition to this literature. Instead, they point to the important distinction between the ability to self-regulate and the motivation to do so. Just because someone is capable of effectively exerting control does not imply that this person will make use of this capability in all possible situations. If a person is accepting of inner experiences such as impulses and desires, there is no need to control them (Ostafin, 2015). Also, there is evidence that mindfulness is associated with more-autonomous activity (Brown & Ryan, 2003). To the extent that a desire is congruent with personal motives, it may be reflectively endorsed

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and autonomously enacted. But when a strong motivating force to restrain oneself comes into play (e.g., perceived conflict with important long-term goals), that person will make full use of self-regulatory abilities. Self-regulatory abilities are a tool in the service of goal attainment: They are available for use, but they can be used flexibly, depending on situational demands and motivational states.

Why is the flexible use of self-regulatory abilities in mindful people not more prominently reflected in the literature? In many pertinent studies, researchers found improved attention regulation and executive functioning after weeks or even months of intensive mindfulness training (Gallant, 2016). There are important differences between these settings and the current research setting. First, the tasks employed in those studies assessed the maximum potential of self-regulatory abilities. Superior performance in such tasks does not necessarily imply the constant use of this maximum force in everyday life. Second, what is altered in such intensive intervention studies is trait mindfulness rather than naturally occurring fluctuations in state mindfulness in daily life. Evidence for the relationship of self-regulatory abilities with everyday fluctuations in state mindfulness is scarcer than, and may not be as strong as, evidence on the relation with trait mindfulness.

Several studies reported effects that are comfortably explained with beneficial effects of mindfulness on restraint (Heppner et al., 2008; Jordan, Wang, Donatoni, & Meier, 2014; Peters et al., 2011). Why was mindfulness generally associated with more restraint in those studies but with less restraint in the present study? One likely reason is that in those studies participants were more strongly motivated to restrain themselves. For example, people who participate in therapeutic interventions aimed at changing emotional and binge eating (Katterman et al., 2014) or facilitating smoking cessation (Bowen & Marlatt, 2009) entered the respective programs because they were motivated to change their behavior in the first place. Therefore, desires from the respective domains will trigger strong conflict and resistance. By contrast, many experienced desires in everyday life from various domains are unlikely to trigger similarly strong resistance. Instead, a mindful, accepting, and less conflict-prone mindset toward one's inner experiences may guide behavior.

Limitations

One peculiar finding in the present data set was that state mindfulness was associated with less use of all assessed self-regulatory strategies but not more use of an acceptance strategy. One would expect the strongest, not the weakest, effect on acceptance (Bishop et al., 2004; Kabat-Zinn, 1994). What happened? We believe that the likely answer is that we used an unfortunate wording of the respective item by asking two questions with potentially independent answers in one. More specifically, we asked to which extent participants "tried to accept" the desire for what it was "but not enact it." The overall findings of the present study suggest that participants were more accepting of their desires when mindful. However, they did *not* try to not enact them. In fact, on average they did quite the opposite. Thus, the two parts of the questions demanded opposite answers, leaving this item basically unanswerable.

An obvious limitation of the present research is the correlational nature of the data that precludes any interpretation of state mindfulness *causing* reduced conflict, resistance, and higher enactment. The present approach allowed for a close look into intrapersonal fluctuations in mindfulness, self-regulatory processes, and emotional experiences over 1 week in participants' lives that a laboratory approach including an experimental manipulation would not have allowed for. Every approach has its unique strengths and limitations that allow for different insights. Future research should try to combine the present approach with ecological momentary interventions (EMIs; Heron & Smyth, 2010). EMIs are small manipulations that allow for repeated within-person experiments in everyday life. By instructing participants at random times to briefly engage in activities known to increase state mindfulness, one may be able to test for causal influences of state mindfulness on everyday self-regulation.

Conclusion

Mindfulness is not necessarily associated with stronger restraint. When mindful, people generally perceived weaker conflicts between desires and other goals and made fewer efforts to control their desires. Rather, they enacted them to a greater extent without apparent negative emotional con-

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sequences. But when the stakes were high, mindful people protected their long-term goals by restraining themselves. State mindfulness was thus associated with wise self-regulation in an admirable way: reaping the short-term hedonic benefits of satisfying momentary desires without endangering higher order goals.

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