Received: 20 May 2021 | Accepted: 9 March 2022

DOI: 10.1111/joop.12389

the british psychological society
promoting excellence in psychology

ARTICLE

Better to be optimistic, mindful, or both? The interaction between optimism, mindfulness, and task engagement

Aldijana Bunjak[1] | **Andrew C. Hafenbrack**[2] | **Matej Černe**[3] | **Johannes F. W. Arendt**[4]

[1]Institute for Leadership and Human Resource Management, University of St. Gallen, St. Gallen, Switzerland

[2]Michael G. Foster School of Business, University of Washington, Seattle, Washington, USA

[3]Faculty of Economics, University of Ljubljana, Ljubljana, Slovenia

[4]Department Psychology, Ludwig-Maximilians-Universitaet Muenchen, Munich, Germany

Correspondence
Aldijana Bunjak, Institute for Leadership and Human Resource Management, University of St. Gallen, St. Gallen, Switzerland.
Email: aldijana.bunjak@unisg.ch

Funding information
Erasmus Mundus Action 2 Project Basileus V Lot 7 Western Balkans, Ghent University, Belgium, Grant/Award Number: 20130836.

Abstract

This paper investigates the relationships between optimism, mindfulness, and task engagement. Specifically, we hypothesized that optimism, mindfulness, and their interaction would facilitate individuals' task engagement. We tested our research model in four studies: two surveys among gig workers and two experiments. The results of the two surveys among gig workers indicated that optimism predicted higher task engagement, but trait mindfulness did not, and that a multiplicative interaction existed between high optimism and high mindfulness in stimulating task engagement. Our two experiments confirmed a significant interaction between optimism and induced state mindfulness and showed that the most engaging situation is being high in both mindfulness and optimism. Although optimism predicted task engagement, the experiments indicated that the effect of the state mindfulness manipulation was above and beyond that of optimism. Finally, we discuss the nuances of the interaction between optimism and mindfulness in predicting task engagement.

KEYWORDS
mindfulness, optimism, task engagement

Practitioner points

- Managers could implement interventions that enhance workers' optimism because optimism strengthens one's orientation toward goal achievement and promotes engagement in various tasks in the workplace.
- Managers could support short mindfulness practice in the workplace to contribute to vibrant and effective task engagement in the organization.
- On-the-spot state mindfulness induction is particularly helpful for task engagement, which people can do via focused breathing meditation for 8–15 min.
- Optimists benefit from the heightened attention that mindfulness practice affords when engaging in tasks. People's task engagement tends to be highest when they are simultaneously high in both optimism and mindfulness.

BACKGROUND

> When you wish upon a star, your dreams come true.
>
> (Jiminy Cricket in Pinocchio: Cliff Edwards)

> No other road, no other way, no day but today
>
> (Mimi Marquez in Rent: Jonathan Larson)

Optimism, the attitude that the outcome of one's efforts will be positive, desirable, and favourable (Scheier & Carver, 1985), has attracted considerable attention in various fields of research, including organizational psychology. A growing body of research has shown that dispositional optimism is an important predictor of employee performance and higher goal achievements (Jensen et al., 2007; Wrosch & Scheier, 2003). Having an optimistic attitude has, for example, been linked to better coping mechanisms and greater resilience and persistence when pursuing goals (Carver et al., 2010). Moreover, research has shown that optimistic visions of the future may help people become engaged in their work (Malinowski & Lim, 2015).

However, optimism can also lead to less effort and weaker subsequent performance when people feel overly optimistic about their prospects for goal achievement (Britton et al., 2012; Geers et al., 2010; Pavlova & Silbereisen, 2013). Similarly, optimism can be even hazardous because it can prevent people from judging reality objectively, causing them to underestimate risks and fail to recognize what they can accomplish (De Meza & Dawson, 2021; Peterson & Park, 2003; Sharot, 2011). Optimists show great effort and task engagement towards high priority goals but tend to decrease effort for low priority goals and goals that may not lead to the preferred outcomes (Geers et al., 2009). These results indicate that whether people are successful in engaging in tasks, defined as sustained interest and immersion in a task, depends not only on their positive future beliefs but also on whether they exert self-regulation in the form of task focus (Carver, 2004).

Mindfulness, an enhanced attention to and awareness of experience, as it occurs in the present moment (Brown & Ryan, 2003; Good et al., 2016; Sutcliffe et al., 2016), has frequently been considered a successful self-regulation tool (Bowlin & Baer, 2012; Leyland et al., 2018) and has been empirically linked to higher levels of task engagement (e.g., Avey et al., 2008; Bunjak & Černe, 2018; Leroy et al., 2013; Malinowski & Lim, 2015), which is why we focused on it in this research. However, like optimism, mindfulness has also demonstrated positive, negative, or null relationships with task engagement across different studies (van Berkel et al., 2014; Imtiaz et al., 2018; Liu et al., 2020; Petchsawang & McLean, 2017; Tuckey et al., 2018).

In sum, studies which sought to link optimism and mindfulness to task engagement indicate that optimism or mindfulness alone might not reliably enhance task engagement. Hence, our study intention is to better understand whether it is better to be optimistic or mindful, or both, when it comes to stimulating individuals' task engagement.

We utilized the resource allocation model (Kanfer & Ackerman, 1989) to understand how optimists and mindful individuals may unlock their capacity and potential for task engagement. Namely, people have a pool of cognitive/attentional resources, which are either distal or proximal driving processes that facilitate their decisions and efforts to engage in tasks. In our study, we proposed optimism as a distal process that helps people allocate their cognitive resources to a task and mindfulness as a proximal self-regulatory process that keeps those resources engaged with the task over time. Metaphorically, optimism can be thought of as a car's engine, whereas mindfulness would be the steering wheel. Hence, the following was our key research question: Is it better to be optimistic or mindful, or both, when it comes to stimulating individuals' task engagement?

By examining the main and interaction effects and potential benefits or costs of optimism and mindfulness on task engagement, this study contributes to both the optimism and mindfulness literatures in two ways. First, we explored the role of optimism. Some believe that people create success by engaging in positive thoughts (Byrne, 2008; Pronin et al., 2006). However, research also has indicated that the power of optimism when engaging in tasks might be somewhat overestimated unless other elements such as one's consciousness, self-awareness, acceptance of reality, or self-control over desired thoughts are not taken into consideration (Manson, 2019; Segerstrom, 2006; Tenney et al., 2015). Hence, in our study, we tapped into the relationship between one's positive attitude towards task engagement and their actual task engagement, providing a better understanding of how people's positive beliefs can translate to valued outcomes.

Second, we contribute to the mindfulness literature by showing that mindfulness alone does not facilitate task engagement (Leroy et al., 2013) as well as it does when combined with optimism. We built on previous work suggesting that mindfulness clears out negativity (Brown et al., 2007; Hafenbrack & Vohs, 2018) but does not reliably translate to task engagement unless there is also already a value of optimism it can magnify. In this, we also answered calls from scholars (Baer & Lykins, 2011; Knight et al., 2019; Malinowski & Lim, 2015; Meyers & van Woerkom, 2016; Monzani et al., 2021; Niemiec et al., 2012) to uncover the relationships between different positive psychological resources. Although optimism contributes to one's task engagement, studies have shown that, in the face of difficulty, optimists disengage more quickly than pessimists (Aspinwall & Richter, 1999). For our study, we proposed mindfulness as a facilitator that may help optimists reduce such potential task disengagement by increasing focus on the present tasks that work towards their goals. We tested our hypotheses in four studies conducted on a crowdsourcing platform and in the laboratory. Figure 1 presents our conceptual model with hypotheses.

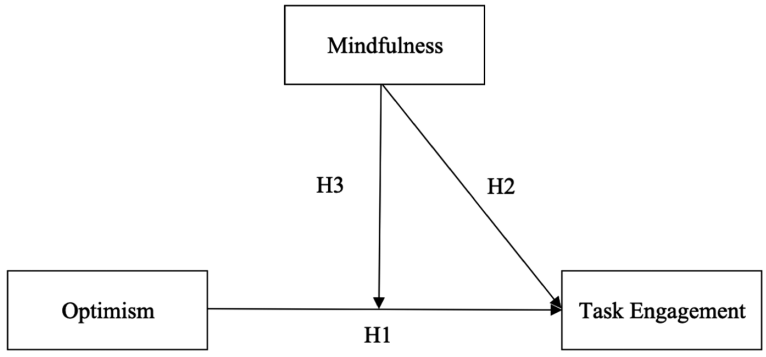

FIGURE 1 The conceptual model with hypotheses

Optimism and task engagement

Optimism is a facet of personality (Carver & Scheier, 2014), and personality is a fundamental determinant of one's task engagement (Young et al., 2018). Substantial research on behavioural self-regulation has indicated that optimism is positively linked to persistence and motivation towards goals (Medlin & Green, 2009) and to greater coping and flexibility when problems arise (Nicholls et al., 2008). The use of character strengths such as optimism creates the sense that the individual is leading a meaningful life in accordance with their goals (Mauno et al., 2007), increasing their task engagement (Miglianico et al., 2019).

Different authors have offered various definitions of task engagement, mostly referring to involvement, absorption, positive energy, commitment, and enthusiasm in everyday activities. For example, Schaufeli and Bakker (2010) described work engagement (i.e., task engagement in the working context) as a positive, fulfilling work-related state of mind that includes vigour, dedication, and absorption. 'A sense of meaning in the world, and connection to persons or objects beyond oneself' (Averill, 2002, p. 182), task engagement means being in flow (Averill, 2002, p. 181), which can be understood as the level of involvement with a task. The Merriam-Webster dictionary described 'engagement' as 'the state of being in gear'. Task engagement has also been defined as one's psychological presence and focus at work (Kahn, 1990, 1992; Rothbard, 2001). Notably, the operationalizations of these scales show remarkable overlap with items included in the absorption, dedication, and vigour scales of the Utrecht Work Engagement Scale (UWES; Schaufeli & Bakker, 2010). In our work, we defined task engagement as an individual's interest and immersion in a task and willingness to invest effort in the understanding of, attention to, and personal interest in a given task (Ho et al., 2011). This definition also aligns with Rothbard's (2001) definition of task engagement, comprising absorption in and attention to a task.

According to Kanfer and Ackerman's (1989) resource allocation model, one's motivation and ultimate engagement in a task is influenced by distal and proximal processes that operate together. To attain a goal, people need to exert some effort and engage in tasks. The choice to exert cognitive resources towards a goal's attainment represents a *distal process*. Because optimists believe that the likelihood of future success will be positive rather than negative, this will help people allocate their cognitive resources to a task. This is partly because people are waste averse (Arkes & Blumer, 1985) and do not want to waste their time on tasks that cannot be accomplished, yet people are willing to commit significant effort when they believe it can yield successful results. Finally, the importance of the outcome goes hand in hand with the motivation and effort invested in attaining a goal (Locke & Latham, 2002). Overall, a positive attitude acts as a rewarding and encouraging factor that keeps people striving towards their goals. Hence, we hypothesized the following:

Hypothesis 1 *Optimism is positively related to task engagement.*

Mindfulness and task engagement

However, optimism might provide only the initial application of cognitive resources, supporting one's decision to engage in a task. Engaging in tasks that are novel and demand less routine skills may require a supplementary 'attentional resources in the face of difficulties' (Kanfer & Ackerman, 1989, p. 661). Thus, besides distal process, task engagement requires additional attentional resources (i.e., *proximal process*) that may return one's attention to a task when it starts to drift away. In our study, we posited mindfulness as a proximal process that may keep one engaged with a task over time.

Mindfulness enhances attentional focus on external (e.g., sights, physical sensations) and internal stimuli (e.g., thoughts, feelings; Brown & Ryan, 2003; Dane, 2011), decreases the automaticity of mental processes (Siegel, 2010), and fosters observation and awareness of moment-to-moment experiences (Brown et al., 2007). It has been argued that mindfulness alters the valence of judgements such that they become less negative (Kiken & Shook, 2011, 2012) and decreases rumination and automatic negative

responses (Jain et al., 2007; Wenk-Sormaz, 2005). Mrazek et al. (2013) demonstrated that mindfulness is more than enhanced attention to details because it can reduce mind wandering and improve working memory function (Chambers et al., 2008).

Brown and Ryan (2003) showed that attention to subjective norms regarding behaviour enhances the quality of an experience in the way that individuals become motivated and immersed in tasks (Aherne et al., 2011). Mindfulness can help people step back and see the big picture regarding a task or endeavour (Anālayo, 2018), which should enhance their abilities to grasp the importance of the outcomes expected if they were to attain a goal. In this sense, mindfulness could underpin the core features of task engagement, which are attention to and focus on tasks, because of the sustained immersion in tasks that mindfulness cues (Hafenbrack & Vohs, 2018; Mrazek et al., 2012).

The intentional self-regulation of attention from moment to moment lies at the heart of mindfulness (Kabat-Zinn, 1990). Importantly, self-regulation allows an individual to exert control over their self (Van Damme et al., 2009) and their inner monologue, which may foster engagement in a task (Chatzisarantis & Hagger, 2007; Hafenbrack et al., 2020; Papies et al., 2015). Mindfulness strengthens the ability to choose which trains of thought to follow versus interrupt, and perceived control over one's choices could lead to greater agency in terms of task focus (despite reducing motivation towards unpleasant, meaningless tasks; Hafenbrack & Vohs, 2018) and task engagement (Leroy et al., 2013). In line with this, mindfulness has also been empirically linked to higher levels of task engagement (Avey et al., 2008; Bunjak & Černe, 2018; Malinowski & Lim, 2015; Tuckey et al., 2018). Thus, we predicted the following:

Hypothesis 2 *Mindfulness is positively related to task engagement.*

Optimism, mindfulness, and task engagement

Although optimism and mindfulness have been associated with task engagement both theoretically and empirically, the empirical findings are mixed.

People are prone to expressing positive future expectancies even when they are not completely justified. For example, optimists strongly believe in success and the likelihood of rewards but may underestimate the chance of losses (Gibson & Sanbonmatsu, 2004; Hmieleski & Baron, 2009). Moreover, optimists tend to underestimate the amount of time they need to complete a task; thus, they can inadequately prepare for it and, ultimately, not complete it (Newby-Clark et al., 2000). It also has been shown that, although optimists expected positive outcomes and became engaged in completing a task, they did not improve their performance as expected (Carver et al., 2010; Tenney et al., 2015). This is because optimists tend to overestimate the importance of self-regulation of their positive expectations, engage less in tasks pursuits, which can lead to eventually missing the opportunity to accomplish their initially established goals (Shepperd et al., 2017).

As previously noted, there are mixed results regarding the relationship between mindfulness and task engagement. For example, state mindfulness impairs one's motivation to complete some, particularly unpleasant tasks (Hafenbrack & Vohs, 2018; Hafenbrack et al., 2021), and for instance, research has confirmed that for within-day correlations, the link between mindfulness and task engagement was weak (Tuckey et al., 2018). Other studies have reported dispositional mindfulness significantly predicts work engagement and engagement during a cognitive task (Imtiaz et al., 2018; Liu et al., 2020; Malinowski & Lim, 2015). Thus, besides testing the direct effects of optimism and mindfulness on task engagement, introducing a boundary condition has the potential to reconcile these mixed findings.

Along this line of thought, little is known about how mindfulness further stimulates what is desired in one's behaviour (Niemiec et al., 2012). Although mindfulness has gained considerable attention from not only researchers but also employers and individuals overall, very few works have linked mindfulness to positive personality characteristics such as optimism (Knight et al., 2019; Monzani et al., 2021). For example, Kiken and Shook (2011) found that mindfulness may increase positive judgements and decrease

negativity bias. One of the possible explanations that the present research is offering is that mindfulness may affect cognitive processes in terms of distinguishing good information from bad. Furthermore, Malinowski and Lim (2015) confirmed the positive relationship between dispositional mindfulness and well-being when the relationship was mediated (partially) by positive affect, hope, and optimism. One possible explanation was that mindfulness may make one refrain from reacting to negative stimuli, which may lead to a more positive outlook on life. Bunjak and Černe (2018) found that mindfulness mediates the relationship between leader and employee optimism matching levels and work engagement, and Charoensukmongkol (2017) showed that optimism mediated some of the effects of mindfulness on the resistance to organizational change. However, optimism is more of a stable trait than mindfulness, which can be easily induced on the state level. Thus, although the two constructs are positively correlated, there are many situations in which people may be high in mindfulness but low in optimism or vice versa.

According to resource allocation model (Kanfer & Ackerman, 1989, p. 661), people have at their disposal limited cognitive/attentional resource allocation processes (distal and proximal) that drive task engagement. The distal ones encompass the perceived utility of expending effort, and the proximal ones include self-regulation processes that keep one's attention focused on a task, rather than drifting off task into mind wandering. Indeed, minds' tendency to wander away from the task at hand poses a nearly-omnipresent challenge (Killingsworth & Gilbert, 2010; Smallwood & Schooler, 2006). As such, we proposed optimism as a distal process that helps people allocate their cognitive resources to a task (because optimists believe they can accomplish their tasks) and mindfulness as a self-regulatory process that keeps those resources engaged with the task over time (because people are metacognitively monitoring their attention and bringing it back to the task when it drifts off: Reina & Kudesia, 2020; see also Kudesia, 2019). Accordingly, we suggested that neither optimism nor mindfulness would predict individuals' task engagement as well as optimism and mindfulness in concert may predict it.

This is also aligned with our theoretical framework; that is, optimism helps by preparing for the initial stage in which cognitive resources are allocated and transmitted into task engagement and mindfulness magnifies the effects of optimism by sustaining attentional efforts on task demands. Thus, we predicted:

Hypothesis 3 *Mindfulness moderates the relationship between optimism and task engagement, such that the positive relationship between optimism and task engagement will be stronger when mindfulness is high.*

Study overview

We conducted four studies to test our hypotheses. We conducted our first two studies (Studies 1 and 2) with gig workers to examine whether and how optimism and dispositional mindfulness predicted task engagement: Study 1 focused on task engagement in their general work, and Study 2 captured their engagement in a specific task embedded in our research design. The rest of the studies were experimental. Studies 3 and 4 manipulated mindfulness with a short mindfulness induction to test the same hypotheses, focusing on induced state mindfulness instead of dispositional mindfulness.

STUDY 1

Method

Sample and procedure

We recruited working professionals via Amazon Mechanical Turk (a crowdsourcing platform). We paid participants $3 for an assigned time of around 10 min. The mandatory requirement was that the participants were employed. The online survey was completed in full (after screening for response validity indicators, time spent on the survey, and flatlining) by 263 full-time employed professionals; 68.1% of

respondents were male, and 53.2% were younger than 35 from various job domains (technology: 44.1%, finance: 13.7%, education: 10.4%, manufacturing: 10.3%). The majority of participants had acquired a bachelor's-level degree (58.6%), and most were from the United States (47.9%), with more than 7 years of work experience (34.6%).

Measures

We measured all variables on Likert-type scales ranging from 1 ('strongly disagree') to 5 ('strongly agree').

Optimism

For optimism, we used the Life Orientation Test-Revised (LOT-R; Scheier et al., 1994). This test is a 10-item measure of individual differences in optimism and pessimism (e.g., 'In uncertain times, I usually expect the best'). Higher scores on the LOT-R generally reflect a greater tendency to expect more positive than negative outcomes (α = .80).

Dispositional mindfulness

We assessed trait mindfulness with the full 15-item Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). Sample items are 'I found it difficult to stay focused on what's happening in the present, (reversed)' and 'I found myself doing things without paying attention. (reversed)' (α = .92).

Task engagement

We assessed task engagement using the six items with the highest validation-article factor loadings adopted from the UWES (Schaufeli et al., 2006) because work consists of a series of tasks. Example items for the components of vigour, dedication, and absorption are, respectively, 'At my work, I feel bursting with energy', 'I am enthusiastic about my job', and 'I feel happy when I am working intensely' (α = .85).

Results

Table 1 presents the descriptive statistics, reliabilities, and correlations of all variables used in the study.

We first observed the factor structure of the focal variables using confirmatory factor analysis procedures in AMOS software, version 21. The expected three-factor solution (optimism, mindfulness, task engagement) displayed a good fit with the data (χ^2 [405] = 592.355, CFI = 0.942, SRMR = 0.064, RMSEA = 0.073). The standardized factor loadings ranged from 0.50 to 0.77 for optimism items, from 0.60 to 0.80 for mindfulness items, and from 0.70 to 0.80 for task engagement items.

To alleviate potential issues related to effects of common method variance (Podsakoff et al., 2012), we applied Lindell and Whitney's (2001) marker variable test, using a theoretically unrelated (marker) variable, and correlated them with the three principal constructs in the model (task engagement, optimism, and dispositional mindfulness). A high average correlation of the marker variable with the study's other principal constructs would indicate potential common method bias. For robustness, we separately repeated the marker variable test with two variables that the model did not include (respondents' tenure

TABLE 1 Study 1—means, standard deviations, reliabilities, and correlations

	Variable	*M*	*SD*	1	2	3
1	Optimism	3.62	0.72	(.80)		
2	Dispositional mindfulness	3.15	0.97	.28**	(.92)	
3	Task engagement	3.93	0.89	.42**	−.02	(.85)

Note: N = 263. Reliabilities (Cronbach's alpha) are indicated on the diagonal in parentheses.

**p < .01.

on Mechanical Turk and how many digital platforms they are on), for which we had little or no theoretical basis to expect a relationship with the study's principal constructs. The average correlation between the study's principal constructs for MTurk tenure ($r = -.07$) and the number of digital platforms ($r = .04$) was low and non-significant, providing no evidence of common method bias.

Simple regression analysis revealed that the direct effect of optimism on task engagement was significant ($b = .53$, $p < .01$), thereby supporting Hypothesis 1. Next, the direct effect of mindfulness on task engagement was not significant ($b = -.02$, *n.s.*); therefore, Hypothesis 2 was not supported. Last, we followed standard procedures to examine interaction effects using a bootstrapping approach (Preacher & Hayes, 2004). Drawing 5000 random samples using replacement from the full sample, we constructed 95% bias-corrected confidence intervals for the hypothesized conditional effects of optimism on task engagement at the values of mindfulness. The interaction term between optimism and mindfulness on task engagement was significant ($b = .19$, $p < .01$), supporting Hypothesis 3 (see Table 2).

We examined the pattern of this moderation following the procedure Aiken et al. (1991) prescribed for probing the interaction between two continuous variables, making comparisons at ±1 *SD* of the moderator (high and low levels of mindfulness). Figure 2 presents the estimated regression line at high and low levels of dispositional mindfulness. Optimism showed a more positive relationship with task engagement when the level of dispositional mindfulness was high (gradient = .70, $t = 6.63$, $p < .01$) than when it was low (gradient = .31, $t = 2.28$, $p < .05$).

Discussion

As we predicted, optimism was positively linked to task engagement (Hypothesis 1), and the interaction effect of optimism and mindfulness on task engagement was also significant (Hypothesis 3). However, the surprising result in this study was that mindfulness did not predict task engagement. One speculative explanation for this observed result is that most employed people who are willing to do studies for small amounts of money on Mechanical Turk lack financial resources and may have jobs that they dislike and do not find personally enjoyable or self-expressive (in line with how two-third of Americans perennially report to Gallup that they are not engaged at work and mindfulness can reduce motivation

TABLE 2 Study 1—results of the moderation analysis with the PROCESS macro

Dependent variable	Task engagement
Constant	4.59 (1.08)**
Optimism	−0.08 (0.28)
Dispositional mindfulness (moderator)	−0.84 (0.30)**
Interaction (optimism × mindfulness)	0.19 (0.08)*
F	15.34
df	(5, 257)
R^2	.23
Conditional effect of optimism on task engagement at the low level of mindfulness (95% bootstrapped confidence intervals)	0.32 (0.13) (LLCI: 0.06, ULCI: 0.57)
Conditional effect of optimism on task engagement at the medium level of mindfulness (95% bootstrapped confidence intervals)	0.53 (0.07) (LLCI: 0.38, ULCI: 0.67)
Conditional effect of optimism on task engagement at the high level of mindfulness (95% bootstrapped confidence intervals)	0.74 (0.10) (LLCI: 0.54, ULCI: 0.95)

Note: $N = 263$. Unstandardized coefficients are reported.

Abbreviations: LLCI, lower-level confidence interval; ULCI, upper-level confidence interval.

*$p < .05$; **$p < .01$.

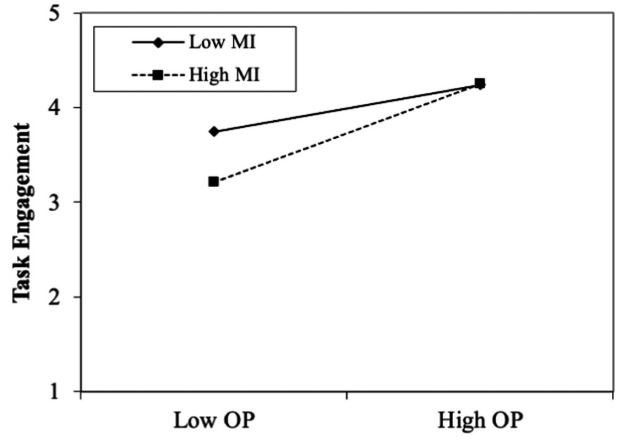

FIGURE 2 The relationship between optimism (OP) and task engagement by the level of dispositional mindfulness (MI) in Study 1

in unenjoyable tasks: Hafenbrack & Vohs, 2018; Hafenbrack et al., 2021).[1] Shepperd et al. (2017) noted that people show high levels of optimism for events that are characterized as favourable/enjoyable but low levels of optimism for events that are unfavourable. Therefore, when mindfulness is high, people are more in touch with the present moment (Brown et al., 2007), perhaps becoming more aware of how disengaged they are in a job if that is the case, but they can deny that fact to themselves if they can convince themselves that it can/will get better (i.e., they are optimists). Hence, when people are aware that tasks are less favourable, they might invest fewer attentional resources to engage in these tasks (Randall et al., 2014, 2019; Sweeny et al., 2006).

It is important to note that the task engagement measure in Study 1 asked participants about their jobs. To determine whether mindfulness has more positive effects on engagement in specific tasks that are more likely to be enjoyable, in our three subsequent studies, we used tasks that involved brainstorming as well as reading and writing about celebrities and parties, things people more often do by choice for free. We did so to create psychological realism regarding the minority of jobs that people find interesting and intrinsically engaging. By changing the task to make it more intrinsically interesting in the subsequent studies, we sought to rule out the possibility that mindfulness was not positively linked to engagement because the tasks participants thought about were unpleasant (akin to motivation in Hafenbrack & Vohs, 2018).

Study 1 was high in external validity in the sense that people were evaluating their work engagement related to their actual work tasks. A weakness of this approach, however, is a great amount of variation occurs in the types of work tasks people engaged in or thought about. Variance in task enjoyability could have accounted for our results if people with more enjoyable tasks were more optimistic about doing well in them and were more engaged in them because they were intrinsically motivating. For this reason and to rule out this potentially lurking third variable, we conducted Study 2.

STUDY 2

We conducted Study 2 to determine whether the Study 1 response pattern would occur again when we held constant the task in which participants engaged. We also measured task enjoyability and included it in our analyses as a control variable.

[1]We intentionally paid participants an above-market rate (the equivalent of $18/hr) to avoid exploiting their possibly low socio-economic status.

Method

Sample and procedure

We recruited working professionals via Amazon Mechanical Turk (a crowdsourcing platform). As in Study 1, we paid participants $3 for an assigned time of around 10 min. The mandatory requirement was that the participants were employed. The online survey was completed in full (after screening for response validity indicators, time spent on the survey, and flatlining) by 336 full-time employed professionals; 69.4% of respondents were male, and 57.4% were younger than 35 years from various job domains (information and communication technology: 44.1%, business and administration: 13.7%, education: 10.6%, manufacturing and processing: 10.1%). The majority of participants had acquired a bachelor's-level degree (58.6%), and most were from the United States (33.4%), with more than 7 years of work experience (33.3%).

Measures

We measured all variables on Likert-type scales ranging from 1 ('strongly disagree') to 5 ('strongly agree').

Optimism

For optimism, we used the LOT-R (Scheier et al., 1994). This test is a 10-item measure of individual differences in optimism and pessimism (e.g., 'In uncertain times, I usually expect the best'). Higher scores on the LOT-R generally reflect a greater tendency to expect more positive than negative outcomes (α = .56).

Dispositional mindfulness

We assessed trait mindfulness with the full 15-item MAAS (Brown & Ryan, 2003). Sample items are 'I found it difficult to stay focused on what's happening in the present, (reversed)' and 'I found myself doing things without paying attention. (reversed)' (α = .91).

Task engagement

We asked the participants to engage in a task based on the Alternative Uses Test (Guilford, 1967). We gave the participants the following instructions: 'Please provide as many ideas as possible for the use of a fork'.

Two independent raters then coded the participants' ideas blindly for the purpose of our study (experts in organizational behaviour, one an academic, one a managing practitioner with 5 years of working experience) on ***quantity*** (the number of ideas) and ***quality*** (novelty and usefulness of the provided ideas).

As noted, our task engagement definition corresponds with Rothbard's (2001) definition of engagement, comprising absorption and attention in the task. Absorption requires high levels of concentration and immersion and as such can be coded as the quality of cognitive efforts in tasks. Similarly, attention relates to the quantity of such cognitive efforts expended (Ho et al., 2011; Lim et al., 2021; Rothbard, 2001). Appendix 1 contains examples of the ideas rated high in quality/quantity.

The two raters' reliability [ICC(2) = .88] and agreement (average deviation = .18) fell within conventional guidelines (LeBreton & Senter, 2008). We averaged their ratings into overall task engagement scores.

Controls

We controlled for perceived ***task enjoyment*** because it could play a role in how eagerly participants engaged in the task at hand. We used three items similar to the logic Alliger and Williams (1993) applied:

TABLE 3 Study 2—means, standard deviations, reliabilities, and correlations

	Variable	*M*	*SD*	1	2	3
1	Optimism	3.64	0.56	(.56)		
2	Dispositional mindfulness	3.14	1.45	.29**	(.91)	
3	Task engagement	3.76	1.15	.39**	.12*	(.88)

Notes: $N = 336$. Reliabilities (Cronbach's alpha and inter-rater agreement in the case of task engagement) are indicated on the diagonal in parentheses.

**$p < .01$; *$p < .05$.

'I thought the task was fun', 'I had a good time doing the task', and 'The task was pleasant'. We averaged the ratings into overall task enjoyment scores ($\alpha = .85$).

Results

Table 3 presents the descriptive statistics, reliabilities, and correlations of all the focal variables used in the study.

To alleviate potential issues related to effects of common method variance, we applied the same test as in Study 1 (marker variable test). The average correlation between the study's principal constructs for digital savviness ($r = .08$) and the number of digital platforms ($r = -.06$) was low and non-significant, providing no evidence of common method bias.

Simple regression analysis revealed that the direct effect of optimism on task engagement was significant ($b = .39$, $p < .01$), thereby supporting Hypothesis 1. Next, the direct effect of mindfulness on task engagement was not significant ($b = .01$, *n.s.*); therefore, Hypothesis 2 was again not supported. Last, we followed standard procedures to examine interaction effects in PROCESS (Hayes, 2013). The interaction term between optimism and mindfulness on task engagement was significant ($b = .14$, $p < .05$), supporting Hypothesis 3 (see Table 4).

We examined the pattern of this moderation following the procedure Aiken et al. (1991) prescribed for probing the interaction between two continuous variables, making comparisons at ±1 *SD* of the

TABLE 4 Study 2—results of the moderation analysis with the PROCESS macro (Model 1)

Dependent variable	Task engagement
Constant	2.05 (0.94)*
Optimism	0.20 (0.26)
Dispositional mindfulness	−0.49 (0.26)
Task enjoyment	0.20 (0.07)**
Interaction (optimism × mindfulness)	0.14 (0.07)*
F	3.88
df	(1, 331)
R^2	.18
Conditional effect of optimism on task engagement at the low level of mindfulness (95% bootstrapped confidence intervals)	0.50 (0.15) (LLCI: 0.20, ULCI: 0.80)
Conditional effect of optimism on task engagement at the medium level of mindfulness (95% bootstrapped confidence intervals)	0.64 (0.12) (LLCI: 0.41, ULCI: 0.87)
Conditional effect of optimism on task engagement at the high level of mindfulness (95% bootstrapped confidence intervals)	0.92 (0.16) (LLCI: 0.60, ULCI: 1.12)

Notes: $N = 336$. Unstandardized coefficients are reported.

Abbreviations: LLCI, lower-level confidence interval; ULCI, upper-level confidence interval.

*$p < .05$; **$p < .01$.

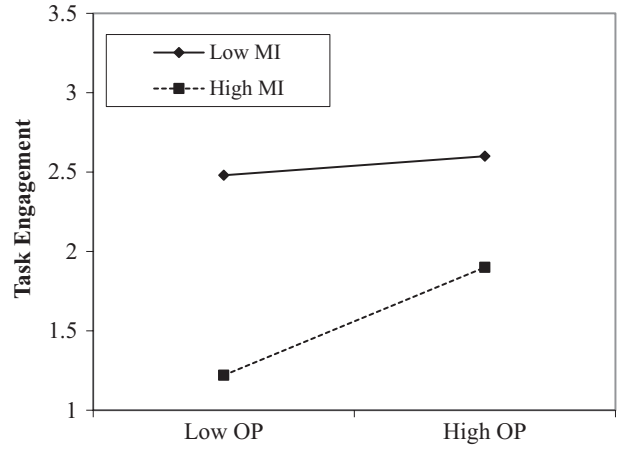

FIGURE 3 The relationship between optimism (OP) and task engagement by the level of dispositional mindfulness (MI) in Study 2

moderator (high and low levels of mindfulness). Figure 3 presents the estimated regression line at high and low levels of dispositional mindfulness. Optimism showed a more positive relationship with task engagement when the level of dispositional mindfulness was high (gradient = .92, $t = 5.84$, $p < .01$) than when it was low (gradient = .50, $t = 3.28$, $p < .01$).[2]

Discussion

This was the second demonstration that optimism leads to increased task engagement, supporting Hypothesis 1, and that is even truer when people are high rather than low in mindfulness, supporting Hypothesis 3. However, so far, Hypothesis 2 that mindfulness would predict increased task engagement has not been supported across two studies in which we operationalized mindfulness as a measured stable trait. That this study used brainstorming, an activity many people enjoy, and also measured and controlled for task enjoyment, rule out the alternative explanation that mindfulness was not positively linked to task engagement because the tasks participants thought about were unpleasant (akin to motivation in Hafenbrack & Vohs, 2018). Perhaps this finding is not surprising in light of previous work that has also shown that within-day correlations between measured mindfulness and work engagement were weak at most (Tuckey et al., 2018). It is also possible that trait mindfulness is simply not a powerful enough determinant of any person's state at a given moment to predict their task engagement. This possibility is consistent with pioneering research on mindfulness by Brown and Ryan (2003, p. 838), who found that 71% of the variation in mindfulness is within-person state variation, rather than between-person trait variation. We decided in the subsequent studies to induce mindfulness as a state to see if that form of mindfulness facilitated task engagement or if we should reject Hypothesis 2 completely for both forms of mindfulness.

STUDY 3

To rule out the alternative explanation that task engagement levels are determining mindfulness levels rather than vice versa, this study had a between-subjects experimental design in which we manipulated state mindfulness. We randomly assigned participants to one of two conditions (mindfulness

[2]The results remained substantively unchanged with the exclusion of task enjoyment as a control.

vs. control). We predicted that condition assignment would interact with participants' reports of their optimism to predict task engagement.

Method

Sample and procedure

We conducted Study 3 at a large public university in Slovenia, EU, and it included 123 students; 50% were male, and about 35% were younger than 25 years. We rewarded participation with course credit for a business skills development course. The participants were bachelor's-level students (35%), and most were Slovenian (52.4%). The next-best represented countries were Germany (8.9%) and France (4%).

We introduced the study by explaining that the aim of the research was to explore the dynamics employees perceive regarding tasks. Participants received a booklet that consisted of two separate questionnaires. First, we measured optimism. After they completed the first questionnaire, we asked participants to stop and wait for further instructions. We randomly assigned them to the mindfulness meditation or control recording. The second questionnaire included a mindfulness assessment, a task to measure their task engagement and collect their demographic information.

Mindfulness meditation versus mind wandering-control inductions

In the mindfulness condition, we asked participants to listen to an audio file (i.e., 8-min meditation) that instructed them to focus on the physical sensations of breathing and contained pauses of varying lengths (e.g., Mahmood et al., 2016). The control condition received instructions on mind wandering (Hafenbrack et al., 2014), asking them to let their minds wander as they normally would (i.e., not to keep attention on present experiences; Arch & Craske, 2006). We informed participants that they should think about whatever came to their mind. Previous studies have validated the opposing natures of mindfulness and mind wandering (Mrazek et al., 2012, 2013), and mind wandering recordings have been the most extensively used comparison conditions to state mindfulness inductions (Arch & Craske, 2006; Dickenson et al., 2012; Hafenbrack & Vohs, 2018; Hafenbrack et al., 2014, 2020, 2021; Jurkovic, 2016; Keng et al., 2016; Kiken & Shook, 2011; Lee & Orsillo, 2014; Rosenstreich, 2016; Rosenstreich & Ruderman, 2017; Wilson et al., 2015; Winning & Boag, 2015) because they replicate a waking baseline state (Mason et al., 2007) that is 'ubiquitous in mental life' (Smallwood & Schooler, 2006, p. 946; see also Killingsworth & Gilbert, 2010) and is therefore high in internal validity, in contrast to mindfulness.

Measures

We measured all variables on Likert-type scales ranging from 1 ('strongly disagree') to 5 ('strongly agree').

Optimism

We used the LOT-R, as in Studies 1 and 2 (α = .70).

Task engagement

The engagement task was to read a short blog entry about the life and death of Amy Winehouse. We asked participants to discuss how accurate, well-written, and informative the blog was (the blog was written with spelling, grammatical, and sentence construction errors), propose possible changes in the blog, and convey their message to the author with instructions:

> Please read the blog below. Please comment on this blog entry in the box below. How accurate, well-written, informative did you find it? What would you like to change? What would you convey to the author? Do you negatively judge the lifestyle of Amy Winehouse? If so, why, if not, why?

We present the blog entry stimuli we used in Appendix 2.

The raters judged participants' task engagement levels by applying the procedure presented in Study 2. We present the examples of the ideas rated high in quality/quantity in Appendix 3.

Based on these criteria, two independent raters who were blind to the study's manipulations and purpose assessed each individual's task engagement. The raters were research colleagues with experience in rating participants' task engagement in their prior research projects. The two raters' reliability [ICC(2) = 0.80] and agreement (average deviation = 0.13) fell within conventional guidelines (LeBreton & Senter, 2008). We averaged their ratings into a measure of the overall task engagement.

Mindfulness (manipulation check)

We measured state mindfulness with the 15-item Toronto Mindfulness Scale (TMS; Lau et al., 2006). The TMS is based on two components—regulation of attention and orientation to experience—as Bishop et al. (2004) proposed. It is a measure of one's level of mindfulness at a single point in time (Lau et al., 2006). A sample item is 'I was curious about my reactions to things' (α = .96).

Results

Table 5 presents the descriptive statistics (means, standard deviations, reliabilities, and correlations) of all variables used in the study.

Manipulation check

Participants in the mindfulness condition reported greater state mindfulness (M = 4.07, SD = 1.17) than did participants in the control condition (M = 3.34, SD = 1.10), $t(122) = -4.72$, $p < .01$, d = .86. Thus, state mindfulness was successfully induced.

Hypotheses tests

We followed the same procedures as in Studies 1 and 2 for examining direct effects and moderation. The simple regression analysis showed that the direct effect of optimism on task engagement was significant (b = .39, $p < .01$), supporting Hypothesis 1. The direct effect of state mindfulness on task engagement also was significant (b = .14, $p < .01$), supporting Hypothesis 2. Further supporting this

TABLE 5 Study 3—means, standard deviations, reliabilities, and correlations

	Variable	*M*	*SD*	1	2	3
1	Optimism	3.89	1.03	(.70)		
2	State mindfulness	3.60	1.10	.26**	(.96)	
3	Task engagement	3.56	1.46	.23**	.24**	(.80)

Note: N = 123. Reliabilities (Cronbach's alpha and inter-rater agreement in the case of task engagement) are indicated on the diagonal in parentheses.

**$p < .01$, *$p < .05$.

hypothesis, the *t*-test also showed significant differences in task engagement across the two mindfulness conditions ($M = 4.44$, $SD = 1.40$ in the mindfulness condition versus $M = 2.28$, $SD = 1.04$ in the control group; $F = 5.50$, $t(122) = 7.56$, $p < .01$). Lastly, using PROCESS, we found the interaction term between optimism and state mindfulness on task engagement to be significant ($b = .33$, $p < .01$), supporting Hypothesis 3 (see Table 6).

As in Studies 1 and 2, we examined the pattern of the moderation following the procedure of Aiken et al. (1991), with comparisons made at ±1 *SD* of the moderator. Figure 4 depicts the estimated regression line at the high and low levels of state mindfulness. Optimism showed a significant positive relationship with task engagement when the level of state mindfulness was high (gradient = .70, $t = 2.01$, $p < .01$), whereas when it was low (gradient = −.13, $t = -.61$, *n.s.*), the relationship was not significant.

TABLE 6 Study 3—results of the moderation analysis with the PROCESS macro

Dependent variable	Task engagement
Constant	6.25 (1.76)**
Optimism	−1.08 (0.37)**
State mindfulness	−1.01 (0.45)*
Interaction (optimism × mindfulness)	0.33 (0.11)*
F	6.83
df	(6, 116)
R^2	.26
Conditional effect of optimism on task engagement at the low level of mindfulness (95% bootstrapped confidence intervals)	−0.22 (0.16) (LLCI: −0.53, ULCI: 0.10)
Conditional effect of optimism on task engagement at the medium level of mindfulness (95% bootstrapped confidence intervals)	0.04 (0.13) (LLCI: −0.22, ULCI: 0.29)
Conditional effect of optimism on task engagement at the high level of mindfulness (95% bootstrapped confidence intervals)	0.44 (0.17) (LLCI: 0.11, ULCI: 0.77)

Note: $N = 123$. Unstandardized coefficients are reported.

Abbreviations: LLCI, lower-level confidence interval; ULCI, upper-level confidence interval.

*p < .05; **p < .01.

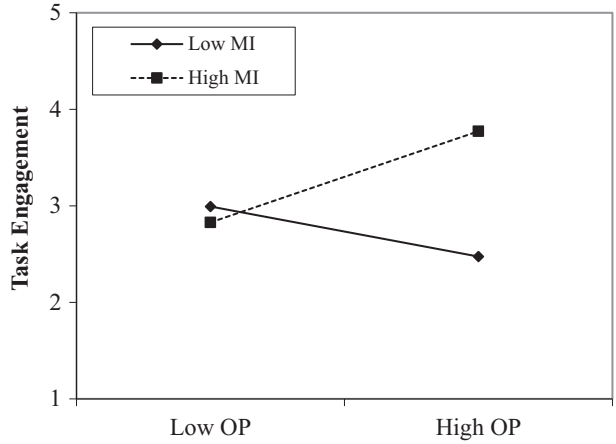

FIGURE 4 The relationship between optimism (OP) and task engagement by the level of state mindfulness (MI) in Study 3

Discussion

As in previous studies, Study 3 found support for a positive link between optimism and task engagement, as well as a multiplicative interaction between optimism and mindfulness on task engagement (Hypotheses 1 and 3). Unlike previous studies, we operationalized mindfulness in Study 3 as an induced state. Perhaps for that reason, Study 3 was the first to find a positive main effect link between mindfulness and task engagement (Hypothesis 2). To test whether the positive effect of induced state mindfulness on task engagement was replicable, we conducted Study 4.

STUDY 4

Although the proposed interaction effect of optimism and mindfulness on task engagement was found in Studies 1–3, we found only mixed support for the hypothesized direct relationship between mindfulness and task engagement across the three studies. Despite this being found in Study 3, the two variables showed no significant correlation in Studies 1 and 2. Against this background, we decided to conduct a fourth study in which we again assigned the participants a task that was more likely to be enjoyable in order to see if we would reproduce the results from Study 3. Study 4 used a different engagement task, to further test the generalizability of our findings.

Method

Sample and procedure

We recruited and compensated 80 post-graduate students in the same manner as in Study 3. The participants' ages ranged from 20 to 28 years, and the mean age was 23.95 years (SD = 1.76). Approximately 52% were female, and 38% of them had between 1 and 4 years of work experience. The participants were master's degree students, and most were Slovenian (82.5%), though a few were from Serbia (7.5%) and the Republic of North Macedonia (5%). The procedure was the same as that of Study 3, except for the engagement task and manipulation check. An experimenter who was blind to the purpose of the study greeted the participants, who received two questionnaires to complete in one sitting.

Measures

All variables were measured on Likert-type scales ranging from 1 ('strongly disagree') to 5 ('strongly agree').

Optimism
The LOT-R was used, as in Studies 1–3 (α = .75).

Task engagement
Participants were asked to consider a scenario where they are asked to organize a welcome party for international students at their university. The following instructions were given:

> You are asked to organize a welcome party for international students at your university. Organizing an event is not a simple task. If you want to pleasantly surprise your guests, think about everything down to the smallest detail: how they register, who will greet participants and how, what music will be playing, what to do during breaks, etc. Please take 5–10 minutes now to think carefully and write down one idea and describe it in detail.

Following the same procedure as in Studies 2 and 3, the raters evaluated participants' task engagement levels, based on criteria for quality and quantity. Appendix 4 includes examples of the ideas rated high in quality/quantity.

In the same manner as in Study 2, the two raters' reliability [ICC(2) = 0.88] and agreement (average deviation = 0.17) were within conventional guidelines (LeBreton & Senter, 2008). We averaged their ratings into a measure of overall task engagement.

Manipulation check

To measure the extent to which the focused-breathing meditation induction cultivated increased awareness of the present moment in the mindfulness condition, we asked participants to report the extent to which they were 'absorbed in the present moment', using a 5-point Likert scale (1 = 'very slightly or not at all', 5 = 'extremely'), based on the logic applied by Hafenbrack et al. (2014, Study 2b).

Results

Table 7 presents the descriptive statistics (means, standard deviations, reliabilities, and correlations) of all variables used in the study.

Manipulation check

Participants in the mindfulness condition reported greater awareness of the present moment ($M = 3.34$, $SD = 1.10$) than did participants in the control condition ($M = 2.12$, $SD = 1.19$), $t(78) = -4.70$, $p < .01$, $d = 1.06$. Thus, state mindfulness was successfully induced.

Hypotheses tests

We followed the same procedures as in Studies 1–3 to examine direct effects and moderation using a bootstrapping approach. The analysis showed that the direct effect of optimism on task engagement was significant ($b = .31$, $p < .01$.), supporting Hypothesis 1. The direct effect of state mindfulness on task engagement also was significant ($b = .24$, $p < .01$), supporting Hypothesis 2. Similar to Study 3 and further supporting Hypothesis 2, the *t*-test also showed significant differences in task engagement across the two conditions ($M = 4.02$, $SD = .91$ in the mindfulness condition versus $M = 2.44$, $SD = .81$ in the control condition; $F = .85$, $t(78) = 8.22$, $p < .01$). Using PROCESS, we found the interaction term between optimism and state mindfulness on task engagement to be significant ($b = .21$, $p < .01$), replicating the support for Hypothesis 3 found in our previous studies (see Table 8).

We again examined the pattern of the moderation following the procedure of Aiken et al. (1991), with comparisons made at ±1 *SD* of the moderator (high and low levels of state mindfulness). Figure 5 presents the estimated regression line at the high and low levels of state mindfulness. Optimism showed a significant

TABLE 7 Study 4—means, standard deviations, reliabilities, and correlations

	Variable	*M*	*SD*	1	2	3
1	Optimism	3.28	0.74	(.75)		
2	State mindfulness	2.70	1.29	.16	(–)	
3	Task engagement	3.24	1.16	.29**	.19*	(.88)

Note: $N = 80$. Reliabilities (Cronbach's alpha and inter-rater agreement in the case of task engagement) are indicated on the diagonal in parentheses.

**$p < .01$, *$p < .05$.

TABLE 8 Study 4—results of the moderation analysis with the PROCESS macro

Dependent variable	Task engagement
Constant	0.45 (2.06)
Optimism	−0.19 (0.30)
State mindfulness	−0.60 (0.35)
Interaction (optimism × mindfulness)	0.21 (0.10)*
F	3.91
df	(5, 74)
R^2	.21
Conditional effect of optimism on task engagement at the low level of mindfulness (95% bootstrapped confidence intervals)	0.01 (0.21) (LLCI: −0.42, ULCI: 0.44)
Conditional effect of optimism on task engagement at the medium level of mindfulness (95% bootstrapped confidence intervals)	0.42 (0.13) (LLCI: 0.15, ULCI: 0.69)
Conditional effect of optimism on task engagement at the high level of mindfulness (95% bootstrapped confidence intervals)	0.63 (0.18) (LLCI: 0.25, ULCI: 1.00)

Note: $N = 80$. Unstandardized coefficients are reported.

Abbreviations: LLCI, lower-level confidence interval; ULCI, upper-level confidence interval.

*$p < .05$; **$p < .01$.

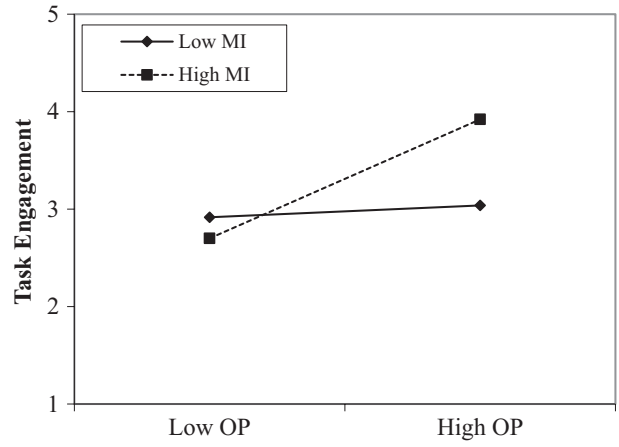

FIGURE 5 The relationship between optimism (OP) and task engagement by the level of state mindfulness (MI) in Study 4

positive relationship with task engagement when the level of state mindfulness was high (gradient = .60, $t = 2.02$, $p < .01$), whereas when it was low (gradient = −.03, $t = -.28$, *n.s.*), the relationship was not significant.

Discussion

Except for the direction of the mindfulness effect, which again differed compared to Studies 1 and 2 and thus supported Hypothesis 2, we replicated in Study 4 the major findings of Study 3. In line with our main proposition, the results indicated that the relationship between participants' optimism and task engagement was more positive when mindfulness was high. In three of our studies, task engagement was highest when both optimism and mindfulness were high, indicating that neither optimism nor mindfulness alone would predict individuals' highest task engagement, as well as optimism and mindfulness acting together can predict it.

GENERAL DISCUSSION

Our research used survey and experimental designs with four different measures of task engagement and two operationalizations of mindfulness (measured trait and induced state) among various national cultures to examine the relationships between optimism, mindfulness, and task engagement. Across four studies conducted with working adults at a crowdsourcing platform and business school students in the lab, we found that, generally, people who are both mindful and optimistic tend to be the most engaged in tasks. In line with the value of replication in psychological science (Cohen, 1994), we demonstrated identical response patterns within each operationalization of mindfulness in two studies each. Studies 1 and 2 showed positive direct effects of optimism on task engagement, and dispositional mindfulness played a moderating role in the link between optimism and task engagement, yet dispositional mindfulness had no effect on task engagement. Receiving a task that is part of one's job but perhaps has little intrinsic and/or extrinsic reward might make people might make people less optimistic in general, thus not engaged. However, Study 2 ruled out the alternative explanation of task enjoyability by keeping the task constant across participants and controlling for task enjoyability. In Studies 3 and 4, the 8-min meditation practice was able to improve participants' engagement in tasks, which was not the case for the trait mindfulness measured in Studies 1 and 2.

Theoretical contributions

Our findings contribute to the optimism and mindfulness literature by focusing on the interaction effects of optimism and mindfulness in the work context and supporting the findings in other life domains where task engagement plays an important role in one's success (Sweeny et al., 2006). Researchers have been examining the beneficial outcomes of mindfulness for several years and have been speculating about the process driving the beneficial outcomes of mindfulness and cognitive processes, such as optimism (Bishop et al., 2004; Glomb et al., 2011; Knight et al., 2019; Shapiro et al., 2006). Moreover, even if optimists are more likely to pursue goals than less optimistic individuals are (Neff & Geers, 2013), no explicit study has shown how the self-regulation at the heart of mindfulness may stimulate a positive expectation that translates to one's task engagement (Niemiec et al., 2012). Thus, our study is especially important for the field of positive psychological functioning because, in addition to focusing on mindfulness approaches when managing mostly psychological problems, far less has been discussed and empirically demonstrated on how mindfulness and individual strengths (i.e., optimism), when operating at the same time, can positively influence one's task engagement (Medlin & Green, 2009; Niemiec et al., 2012). Similarly, a recent study showed the positive indirect effect of non-reactivity (a facet of mindfulness) via positive affect and optimism on work engagement (Malinowski & Lim, 2015), but evidence for boundary conditions in the relationship between optimism and task engagement is still lacking (Knight et al., 2019). Our research contributes to further informing this relationship.

In addition, this study extends the resource allocation model by introducing optimism to the theoretical framework as a cognitive resource. Kanfer and Ackerman's (1989) model has been applied to mindfulness (Reina & Kudesia, 2020) and related phenomena such as mind wandering (Randall et al., 2014, 2019) and affective processes (for a review, see Beal et al., 2005). Our work complements the existing studies by showing that people's positive expectations are likely to drive them to take action and engage in tasks. However, positive expectations may also require one's self-regulatory attention (i.e., mindfulness) to facilitate optimal task engagement.

Research has shown that optimists tend to prioritize certain situations and exert greater efforts when goals seem to be favourable and achievable (Britton et al., 2012). Thus, enhanced self-regulatory attention to the present moment may prevent individuals from having unrealistic expectations and improve their judgement and decisions to engage in tasks that work towards realistic goals (De Meza & Dawson,

2021; Forgeard & Seligman, 2012). Across four studies, we showed that mindfulness helps people stay in touch with their positive expectations, even when working conditions are not ideal. For gig workers, this may mean that vague and challenging working conditions do not hamper the motivation to stay engaged in tasks. That is, optimists could manage to keep their positivity based on their optimistic predictions that they can accomplish their tasks because mindfulness provides additional attentional resources that are continually directed into their task engagement. Additionally, simply thinking about possible positive future outcomes may already satisfy people's inner desire and therefore decrease the persistence and motivation to engage in tasks (Oettingen et al., 2015). However, mindfulness could balance these out by monitoring the individual's attention and bringing it back to the task when the outcome seems to be too costly or not feasible.

In addition, the students who were engaging in lab tasks might have been challenged, too, because these tasks were not a matter of choice (they were imposed on the students) and as such did not carry a lot of meaning or joy. However, similar to before, we showed that when working in concert with positive expectations, mindfulness may free additional attentional resources and allow one to focus on positive information in the present moment, which facilitates task engagement. Compared to animals that experience life only in the present, human beings make the most sense of their life stories when they are able to connect the present and future (Baumeister et al., 2016). Hence, the students who might have experienced the lab tasks as meaningless could sustain their effort on those tasks because high self-awareness of present actions is frequently a precondition for desired future success. In sum, we conclude that neither optimism nor mindfulness alone would facilitate individuals' task engagement as well as optimism and mindfulness working in concert do.

Practical implications

Employees at all levels face unpredictable challenges in their day-to-day activities and career pursuits. Our study shows that high optimism and mindfulness typically contribute to higher task engagement. Therefore, these results are applicable to employees, enabling them to enhance the benefits of personality strengths, such as optimism (Peterson & Seligman, 2004). Having an optimistic attitude would give them a stronger orientation towards goal achievement, thus promoting engagement in various tasks in the workplace. We conclude that depending on the characteristics of the constructs (i.e., stable dispositional or malleable state mindfulness), optimists will benefit from the heightened attention that mindfulness practice affords, especially short-term practice that induces state mindfulness. When trying to prioritize tasks, knowledge workers who can choose what to work on (researchers choosing projects, lawyers choosing cases, journalists choosing stories, consultants choosing projects, etc.) might find an on-the-spot state mindfulness induction (Hafenbrack, 2017) particularly helpful.

Similarly, for a large number of people, everyday life tasks are imposed on them and are not particularly a matter of their choice, which may hamper their motivation to stay engaged in those tasks. Despite the fact that meaningless tasks do not evoke positive attitudes (Krok & Telka, 2019), people who maintain optimistic outlooks on future events when fully aware of the benefits and rewards that may follow will succeed in task engagement no matter how difficult that might be. Hence, another practical implication for managers is to implement interventions that may enhance workers' optimism. They could achieve this by implementing the Best Possible Self method in personal development training programs. The Best Possible Self intervention involves asking individuals to imagine a future in which everything has turned out well. This intervention also could be implemented during a longer period (8 weeks or longer) on a personal level (Bolier et al., 2013).

Moreover, our results suggest that even a short mindfulness practice could be beneficial to everyday social activities of crucial importance to an organization. Such training should be brought into the workplace to contribute to vibrant and effective task engagement in the organization. Long mindfulness exercises may be considered inappropriate for the workplace (Hülsheger et al., 2015), but brief

mindfulness training (e.g., a mindful lunch or mindful walking) could enhance the benefits of individuals' character strengths, increase positive attitudes about specific behaviours (Arch et al., 2016; Hanley et al., 2015; Imtiaz et al., 2018), or—as in our study—cue deeper engagement in work tasks.

Limitations and future directions

Our studies are limited in several ways. Because we were changing other things in each study, we wanted to keep the control condition consistent to allow for more precise comparisons. However, an active control condition would have also made sense and could be implemented in future research. Even though our constructs called for individuals' assessments of phenomena they experienced in different environmental settings, and thereby could not be other-rated, the limitations in Study 1 are related mainly to the self-reported nature of the data gathering, and the shortened (albeit previously validated; Schaufeli et al., 2017) UWES scale used to capture participants' task engagement at work. Studies 1 and 2 were also cross-sectional, so we could not draw causal claims but could only test their implications in a correlational manner. Nevertheless, in attempting to minimize the problem of common method variance (Podsakoff et al., 2003), we ensured that participants could not guess the purpose of the study by providing vague study titles that did not give away the variables (e.g., 'Tasks and Temporal Feelings'), provided respondent anonymity, used a large-scale study where we were able to employ counterbalancing question order, improved scale items by keeping the questions simple and concise, and conducted additional post hoc marker variable tests.

Studies 1 and 2 were also conducted by recruiting participants via MTurk. Although we followed recent best-practice recommendations such as using response validity indicators and conducting data screening (Chmielewski & Kucker, 2019), those studies suffer from limitations related to such a data collection approach (Marder & Fritz, 2015). In any case, Studies 3 and 4 were conducted in a different setting and addressed the issue of whether the causality between the variables (optimism, which we measured before participants completed the task; mindfulness, which we manipulated with random assignment to state mindfulness induction versus a control condition; and task engagement) could be reversed. However, future field research into mindfulness could benefit from a longitudinal study that tests the causality of proposed relationships in real-life settings and examines a temporal dimension, that is, whether and how the interaction of optimism with mindfulness can help employees progress at work.

An intervention that can increase state optimism (Spencer et al., 2005) could also help test the directionality of the observed relationships. Similarly, it would be interesting to work on increasing a state of optimism by means of various interventions and to see how such processes interact with one's dispositional mindfulness on task engagement. These interventions would still represent a backward indirect link between the future (positive expectations) and the present (self-awareness of present moment), where the manipulated state of optimism could influence one's perception of value and meaning, hence also influencing task engagement.

In light of how mindfulness can occur in the absence of meditation (Reina & Kudesia, 2020), an overall limitation of our studies is the operationalization of the mindfulness construct and whether this phenomenon is internally or externally assigned. In Studies 1 and 2, the perceived mindfulness variable seemed to be linked more to the respondents' personal awareness of their internal states, whereas in Studies 3 and 4, it was externally induced. This needs to be acknowledged when interpreting the results of these studies, which is both a limitation and a strength at the same time. In Studies 3 and 4, we tested our hypotheses with college students (who at least were not in North America; Henrich et al., 2010). There is no doubt that students' success is often measured by whether they achieve goals. However, a test of generality in work and life settings is needed. Although the use of student samples has not been deemed highly problematic in organizational research (Wheeler et al., 2014), future research could employ the examined relationship postulated here in workplace conditions (e.g., a field experiment).

Conclusions

In conclusion, we are contributing to the literature on positive human functioning from a multidimensional perspective by exploring the effects of optimism and mindfulness on task engagement, by examining both their main and interaction effects on this outcome. Based on these findings, we conclude that dispositional mindfulness and state mindfulness strengthen the positive effect of optimism on task engagement. To answer our research question, when it comes to task engagement, optimism is more reliably helpful than mindfulness, but it is best to be both optimistic and mindful.

ACKNOWLEDGEMENTS

We are thankful to the editor, Professor Julie Gore, and anonymous reviewers for constructive feedback and guidance during the review process. Open Access Funding provided by Universitat St Gallen. [Correction added on 20th May 2022, after first online publication: CSAL funding statement has been added.]

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

AUTHOR CONTRIBUTIONS

Aldijana Bunjak: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Supervision; Validation; Visualization; Writing—original draft; Writing—review & editing. **Andrew C. Hafenbrack:** Conceptualization; Methodology; Visualization; Writing—review & editing. **Matej Černe:** Conceptualization; Formal analysis; Investigation; Methodology; Resources; Validation; Visualization; Writing—review & editing. **Johannes F. W. Arendt:** Conceptualization; Writing—review & editing.

ETHICAL APPROVAL

The authors certify that the research presented in this manuscript was conducted in compliance with the ethical standards regarding research with human participants and scientific integrity. Participants were free to not participate and to terminate participation at any time without any consequence or any loss they were otherwise entitled to receive. The studies were approved by the institutional ethics committee (Granting body—University of Ljubljana, Protocol number: 1-2018, Title: 'Mindfulness - the missing link in the relationship between leader-follower strategic optimism (mis)match and work engagement').

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Aldijana Bunjak https://orcid.org/0000-0003-3723-8568
Andrew C. Hafenbrack https://orcid.org/0000-0002-9186-4212
Matej Černe https://orcid.org/0000-0001-5049-588X
Johannes F. W. Arendt https://orcid.org/0000-0002-6998-4461

REFERENCES

Aherne, C., Moran, A. P., & Lonsdale, C. (2011). The effect of mindfulness training on athletes' flow: An initial investigation. *The Sport Psychologist*, *25*(2), 177–189. https://doi.org/10.1123/tsp.25.2.177

Aiken, L. S., West, S. G., & Reno, R. R. (1991). Multiple regression: Testing and interpreting interactions. *Sage*.

Alliger, G. M., & Williams, K. J. (1993). Using signal-contingent experience sampling methodology to study work in the field: A discussion and illustration examining task perceptions and mood. *Personnel Psychology*, *46*(3), 525–549. https://doi.org/10.1111/j.1744-6570.1993.tb00883.x

Anālayo, B. (2018). Once again on mindfulness and memory in early Buddhism. *Mindfulness*, *9*(1), 1–6. https://doi.org/10.1007/s12671-017-0870-3

Arch, J. J., Brown, K. W., Goodman, R. J., Della Porta, M. D., Kiken, L. G., & Tillman, S. (2016). Enjoying food without caloric cost: The impact of brief mindfulness on laboratory eating outcomes. *Behaviour Research and Therapy*, *79*, 23–34. https://doi.org/10.1016/j.brat.2016.02.002

Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy*, *44*(12), 1849–1858. https://doi.org/10.1016/j.brat.2005.12.007

Arkes, H. R., & Blumer, C. (1985). The psychology of sunk cost. *Organizational Behavior and Human Decision Processes*, *35*(1), 124–140. https://doi.org/10.1016/0749-5978(85)90049-4

Aspinwall, L. G., & Richter, L. (1999). Optimism and self-mastery predict more rapid disengagement from unsolvable tasks in the presence of alternatives. *Motivation and Emotion*, *23*(3), 221–245. https://doi.org/10.1023/A:1021367331817

Averill, J. R. (2002). Emotional creativity: Toward "Spiritualizing the Passions". In C. R. Snyder & S. J. Lopez (Eds.), *Oxford handbook of positive psychology* (pp. 172–188). Oxford University Press.

Avey, J. B., Wernsing, T. S., & Luthans, F. (2008). Can positive employees help positive organizational change? Impact of psychological capital and emotions on relevant attitudes and behaviors. *Journal of Applied Behavioral Science*, *44*(1), 48–70. https://doi.org/10.1177/0021886307311470

Baer, R. A., & Lykins, E. L. B. (2011). Mindfulness and positive psychological functioning. In K. M. Sheldon, T. B. Kashdan & M. F. Steger (Eds.), *Designing positive psychology: Taking stock and moving forward* (pp. 335–348). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195373585.003.0022

Baumeister, R. F., Vohs, K. D., & Oettingen, G. (2016). Pragmatic prospection: How and why people think about the future. *Review of General Psychology*, *20*(1), 3–16. https://doi.org/10.1037/gpr0000060

Beal, D. J., Weiss, H. M., Barros, E., & MacDermid, S. M. (2005). An episodic process model of affective influences on performance. *Journal of Applied Psychology*, *90*(6), 1054–1068. https://doi.org/10.1037/0021-9010.90.6.1054

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., Segal, Z. V., Abbey, S., Speca, M., Velting, D., & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, *11*(3), 230–241. https://doi.org/10.1093/clipsy.bph077

Bolier, L., Haverman, M., Westerhof, G. J., Riper, H., Smit, F., & Bohlmeijer, E. (2013). Positive psychology interventions: A meta-analysis of randomized controlled studies. *BMC Public Health*, *13*(1), 1–20. https://doi.org/10.1186/1471-2458-13-119

Bowlin, S. L., & Baer, R. A. (2012). Relationships between mindfulness, self-control, and psychological functioning. *Personality and Individual Differences*, *52*(3), 411–415. https://doi.org/10.1016/j.paid.2011.10.050

Britton, A. R., Sliter, M. T., & Jex, S. M. (2012). Is the glass really half-full? The reverse-buffering effect of optimism on undermining behavior. *Personality and Individual Differences*, *52*(6), 712–717. https://doi.org/10.1016/j.paid.2011.12.038

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

Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for salutary effects. *Psychological Inquiry*, *18*, 211–237. https://doi.org/10.1080/10478400701598298

Bunjak, A., & Černe, M. (2018). Mindfulness—The missing link in the relationship between leader–follower strategic optimism (mis) match and work engagement. *Frontiers in Psychology*, *9*, 2444. https://doi.org/10.3389/fpsyg.2018.02444

Byrne, R. (2008). *The secret*. Simon and Schuster.

Carver, C. S. (2004). Self-regulation of action and affect. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 13–39). Guilford Press.

Carver, C. S., & Scheier, M. F. (2014). Dispositional optimism. *Trends in Cognitive Sciences*, *18*(6), 293–299. https://doi.org/10.1016/j.tics.2014.02.003

Carver, C. S., Scheier, M. F., & Segerstrom, S. C. (2010). Optimism. *Clinical Psychology Review*, *30*(7), 879–889. https://doi.org/10.1016/j.cpr.2010.01.006

Chambers, R., Lo, B. C. Y., & Allen, N. B. (2008). The impact of intensive mindfulness training on attentional control, cognitive style, and affect. *Cognitive Therapy and Research*, *32*(3), 303–322. https://doi.org/10.1007/s10608-007-9119-0

Charoensukmongkol, P. (2017). Contributions of mindfulness during post-merger integration. *Journal of Managerial Psychology*, *32*(1), 104–118. https://doi.org/10.1108/JMP-02-2016-0039

Chatzisarantis, N. L. D., & Hagger, M. S. (2007). Mindfulness and the intention-behavior relationship within the theory of planned behavior. *Personality and Social Psychology Bulletin*, *33*(5), 663–676. https://doi.org/10.1177/0146167206297401

Chmielewski, M., & Kucker, S. C. (2019). An MTurk crisis? Shifts in data quality and the impact on study results. *Social Psychological and Personality Science*, *11*(4), 464–473. https://doi.org/10.1177/1948550619875149

Cohen, J. (1994). The earth is round (p <.05). *American Psychologist*, *49*, 997–1003. https://doi.org/10.1037/0003-066X.49.12.997

Dane, E. (2011). Paying attention to mindfulness and its effects on task performance in the workplace. *Journal of Management*, *37*(4), 997–1018. https://doi.org/10.1177/0149206310367948

De Meza, D., & Dawson, C. (2021). Neither an optimist nor a pessimist be: Mistaken expectations lower well-being. *Personality and Social Psychology Bulletin*, *47*(4), 540–550. https://doi.org/10.1177/0146167220934577

Dickenson, J., Berkman, E., Arch, J., & Lieberman, M. (2012). Neural correlates of focused attention during a brief mindfulness induction. *Social Cognitive and Affective Neuroscience*, *8*(1), 40–47. https://doi.org/10.1093/scan/nss030

Forgeard, M. J. C., & Seligman, M. E. P. (2012). Seeing the glass half full: A review of the causes and consequences of optimism. *Pratiques Psychologiques*, *18*(2), 107–120. https://doi.org/10.1016/j.prps.2012.02.002

Geers, A. L., Wellman, J. A., & Lassiter, G. D. (2009). Dispositional optimism and engagement: The moderating influence of goal prioritization. *Journal of Personality and Social Psychology*, *96*(4), 913–932. https://doi.org/10.1037/a0014830

Geers, A. L., Wellman, J. A., Seligman, L. D., Wuyek, L. A., & Neff, L. A. (2010). Dispositional optimism, goals, and engagement in health treatment programs. *Journal of Behavioral Medicine*, *33*(2), 123–134. https://doi.org/10.1007/s10865-009-9238-z

Gibson, B., & Sanbonmatsu, D. M. (2004). Optimism, pessimism, and gambling: The downside of optimism. *Personality and Social Psychology Bulletin*, *30*(2), 149–160. https://doi.org/10.1177/0146167203259929

Glomb, T. M., Duffy, M. K., Bono, J. Y., & Yang, T. (2011). Mindfulness at work. In A. Joshi, H. Liao & J. J. Martocchio (Eds.), *Research in personnel and human resources management* (Vol. *30*, pp. 115–157). Emerald Group Publishing. https://doi.org/10.1108/S0742-7301(2011)0000030005

Good, D. J., Lyddy, C. J., Glomb, T. M., Bono, J. E., Brown, K. W., Duffy, M. K., Baer, R. A., Brewer, J. A., & Lazar, S. W. (2016). Contemplating mindfulness at work: An integrative review. *Journal of Management*, *42*(1), 114–142. https://doi.org/10.1177/0149206315617003

Guilford, J. P. (1967). *The nature of human intelligence*. McGraw-Hill.

Hafenbrack, A. C. (2017). Mindfulness meditation as an on-the-spot workplace intervention. *Journal of Business Research*, *75*, 118–129. https://doi.org/10.1016/j.jbusres.2017.01.017

Hafenbrack, A. C., Cameron, L. D., Spreitzer, G. M., Zhang, C., Noval, L. J., & Shaffakat, S. (2020). Helping people by being in the present: Mindfulness increases prosocial behavior. *Organizational Behavior and Human Decision Processes*, *159*, 21–38. https://doi.org/10.1016/j.obhdp.2019.08.005

Hafenbrack, A. C., Kinias, Z., & Barsade, S. G. (2014). Debiasing the mind through meditation: Mindfulness and the sunk-cost bias. *Psychological Science*, *25*(2), 369–376. https://doi.org/10.1177/0956797613503853

Hafenbrack, A. C., LaPalme, M. L., & Solal, I. (2021). Mindfulness meditation reduces guilt and prosocial reparation. *Journal of Personality and Social Psychology*. https://doi.org/10.1037/pspa0000298

Hafenbrack, A. C., & Vohs, K. D. (2018). Mindfulness meditation impairs task motivation but not performance. *Organizational Behavior and Human Decision Processes*, *147*, 1–15. https://doi.org/10.1016/j.obhdp.2018.05.001

Hanley, A. W., Warner, A. R., Dehili, V. M., Canto, A. I., & Garland, E. L. (2015). Washing dishes to wash the dishes: Brief instruction in an informal mindfulness practice. *Mindfulness*, *6*(5), 1095–1103. https://doi.org/10.1007/s12671-014-0360-9

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression based approach*. The Guilford Press. https://doi.org/10.1111/jedm.12050

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, *33*(2–3), 61–83. https://doi.org/10.1017/S0140525X0999152X

Hmieleski, K. M., & Baron, R. A. (2009). Entrepreneurs' optimism and new venture performance: A social cognitive perspective. *Academy of Management Journal*, *52*(3), 473–488. https://doi.org/10.5465/amj.2009.41330755

Ho, V. T., Wong, S. S., & Lee, C. H. (2011). A tale of passion: Linking job passion and cognitive engagement to employee work performance. *Journal of Management Studies*, *48*(1), 26–47. https://doi.org/10.1111/j.1467-6486.2009.00878.x

Hülsheger, U. R., Feinholdt, A., & Nübold, A. (2015). A low-dose mindfulness intervention and recovery from work: Effects on psychological detachment, sleep quality, and sleep duration. *Journal of Occupational and Organizational Psychology*, *88*(3), 464–489. https://doi.org/10.1111/joop.12115

Imtiaz, F., Ji, L. J., & Vaughan-Johnston, T. (2018). Exploring the influence of a low-dose mindfulness induction on performance and persistence in a challenging cognitive task. *Journal of Theoretical Social Psychology*, *2*(4), 107–118. https://doi.org/10.1002/jts5.32

Jain, S., Shapiro, S. L., Swanick, S., Roesch, S. C., Mills, P. M., Bell, I., & Schwartz, G. E. R. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: Effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine*, *33*, 11–21. https://doi.org/10.1207/s15324796abm3301_2

Jensen, S. M., Luthans, K. W., Lebsack, S. A., & Lebsack, R. R. (2007). Optimism and employee performance in the banking industry. *Journal of Applied Management and Entrepreneurship*, *12*(3), 57.

Jurkovic, M. (2016). Effect of short-term mindfulness induction on myside bias and miserly processing: A preliminary study. *Studia Psychologica*, *58*(3), 231–237. https://doi.org/10.21909/sp.2016.03.719

Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain and illness*. Bantam Dell.

Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at Work. *Academy of Management Journal*, *33*(4), 692–724. https://doi.org/10.5465/256287

Kahn, W. A. (1992). To be fully there: Psychological presence at work. *Human Relations*, *45*(4), 321–349. https://doi.org/10.1177/001872679204500402

Kanfer, R., & Ackerman, P. L. (1989). Motivation and cognitive abilities: An integrative/aptitude-treatment interaction approach to skill acquisition. *Journal of Applied Psychology*, *74*(4), 657–690. https://doi.org/10.1037/0021-9010.74.4.657

Keng, S. L., Seah, S. T., Tong, E. M., & Smoski, M. (2016). Effects of brief mindful acceptance induction on implicit dysfunctional attitudes and concordance between implicit and explicit dysfunctional attitudes. *Behaviour Research and Therapy*, *83*(12), 1–10. https://doi.org/10.1016/j.brat.2016.05.004

Kiken, L. G., & Shook, N. J. (2011). Looking up: Mindfulness increases positive judgments and reduces negativity bias. *Social Psychological and Personality Science*, *2*(4), 425–431. https://doi.org/10.1177/1948550610396585

Kiken, L. G., & Shook, N. J. (2012). Mindfulness and emotional distress: The role of negatively biased cognition. *Personality and Individual Differences*, *52*(3), 329–333. https://doi.org/10.1016/j.paid.2011.10.031

Killingsworth, M. A., & Gilbert, D. T. (2010). A wandering mind is an unhappy mind. *Science*, *330*(6006), 932. https://doi.org/10.1126/science.1192439

Knight, C., Patterson, M., & Dawson, J. (2019). Work engagement interventions can be effective: A systematic review. *European Journal of Work and Organizational Psychology*, *28*(3), 348–372. https://doi.org/10.1080/1359432X.2019.1588887

Krok, D., & Telka, E. (2019). Optimism mediates the relationships between meaning in life and subjective and psychological well-being among late adolescents. *Current Issues in Personality Psychology*, *7*(1), 32–42. https://doi.org/10.5114/cipp.2018.79960

Kudesia, R. S. (2019). Mindfulness as metacognitive practice. *Academy of Management Review*, *44*(2), 405–423. https://doi.org/10.5465/amr.2015.0333

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

LeBreton, J. M., & Senter, J. L. (2008). Answers to 20 questions about interrater reliability and interrater agreement. *Organizational Research Methods*, *11*(4), 815–852. https://doi.org/10.1177/1094428106296642

Lee, J. K., & Orsillo, S. M. (2014). Investigating cognitive flexibility as a potential mechanism of mindfulness in generalized anxiety disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, *45*(1), 208–216. https://doi.org/10.1016/j.jbtep.2013.10.008

Leroy, H., Anseel, F., Dimitrova, N. G., & Sels, L. (2013). Mindfulness, authentic functioning, and work engagement: A growth modeling approach. *Journal of Vocational Behavior*, *82*(3), 238–247. https://doi.org/10.1016/j.jvb.2013.01.012

Leyland, A., Emerson, L. M., & Rowse, G. (2018). Testing for an effect of a mindfulness induction on child executive functions. *Mindfulness*, *9*(6), 1807–1815. https://doi.org/10.1007/s12671-018-0923-2

Lim, J. H., Tai, K., & Kouchaki, M. (2021). Ambivalent bosses: An examination of supervisor expressed emotional ambivalence on subordinate task engagement. *Organizational Behavior and Human Decision Processes*, *165*, 139–152. https://doi.org/10.1016/j.obhdp.2021.05.001

Lindell, M. K., & Whitney, D. J. (2001). Accounting for common method variance in cross-sectional research designs. *The Journal of Applied Psychology*, *86*(1), 114–121. https://doi.org/10.1037/0021-9010.86.1.114

Liu, S., Xin, H., Shen, L., He, J., & Liu, J. (2020). The influence of individual and team mindfulness on work engagement. *Frontiers in Psychology*, *10*, 2928. https://doi.org/10.3389/fpsyg.2019.02928

Locke, E., & Latham, G. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, *57*(9), 705–717. https://doi.org/10.1037/0003-066X.57.9.705

Mahmood, L., Hopthrow, T., & de Moura, G. R. (2016). A moment of mindfulness: Computer-mediated mindfulness practice increases state mindfulness. *PLoS One*, *11*(4), e0153923. https://doi.org/10.1371/journal.pone.0153923

Malinowski, P., & Lim, H. J. (2015). Mindfulness at work: Positive affect, hope, and optimism mediate the relationship between dispositional mindfulness, work engagement, and well-being. *Mindfulness*, *6*(6), 1250–1262. https://doi.org/10.1007/s12671-015-0388-5

Manson, M. (2019). *Everything Is F*cked: A book about hope*. Harper Collins.

Marder, J., & Fritz, M. (2015). The Internet's hidden science factory. *PBS NewsHour*. Retrieved from: http://www.pbs.org/newshour/updates/inside-amazons-hidden-science-factory/

Mason, M. F., Norton, M. I., Van Horn, J. D., Wegner, D. M., Grafton, S. T., & Macrae, C. N. (2007). Wandering minds: The default network and stimulus-independent thought. *Science*, *315*(5810), 393–395. https://doi.org/10.1126/science.1131295

Mauno, S., Kinnunen, U., & Ruokolainen, M. (2007). Job demands and resources as antecedents of work engagement: A longitudinal study. *Journal of Vocational Behavior*, *70*(1), 149–171. https://doi.org/10.1016/j.jvb.2006.09.002

Medlin, B., & Green, Jr., K. W. (2009). Enhancing performance through goal setting, engagement, and optimism. *Industrial Management & Data Systems*, *109*(7), 943–956. https://doi.org/10.1108/02635570910982292

Meyers, M. C., & van Woerkom, M. (2016). Effects of a strengths intervention on general and work-related well-being: The mediating role of positive affect. *Journal of Happiness Studies*, *18*(3), 671–689. https://doi.org/10.1007/s10902-016-9745-x

Miglianico, M., Dubreuil, P., Miquelon, P., Bakker, A. B., & Martin-Krumm, C. (2019). Strength use in the workplace: A literature review. *Journal of Happiness Studies*, *21*, 737–764. https://doi.org/10.1007/s10902-019-00095-w

Monzani, L., Escartín, J., Ceja, L., & Bakker, A. B. (2021). Blending mindfulness practices and character strengths increases employee well-being: A second-order meta-analysis and a follow-up field experiment. *Human Resource Management Journal*, *31*(4), 1025–1062. https://doi.org/10.1111/1748-8583.12360

Mrazek, M. D., Franklin, M. S., Phillips, D. T., Baird, B., & Schooler, J. W. (2013). Mindfulness training improves working memory capacity and GRE performance while reducing mind wandering. *Psychological Science*, *24*(5), 776–781. https://doi.org/10.1177/0956797612459659

Mrazek, M. D., Smallwood, J., & Schooler, J. W. (2012). Mindfulness and mind-wandering: Finding convergence through opposing constructs. *Emotion*, *12*(3), 442–448. https://doi.org/10.1037/a0026678

Neff, L. A., & Geers, A. L. (2013). Optimistic expectations in early marriage: A resource or vulnerability for adaptive relationship functioning? *Journal of Personality and Social Psychology*, *105*(1), 38–60. https://doi.org/10.1037/a0032600

Newby-Clark, I. R., Ross, M., Buehler, R., Koehler, D. J., & Griffin, D. (2000). People focus on optimistic scenarios and disregard pessimistic scenarios while predicting task completion times. *Journal of Experimental Psychology: Applied*, *6*(3), 171–182. https://doi.org/10.1037/1076-898x.6.3.171

Nicholls, A. R., Polman, R. C., Levy, A. R., & Backhouse, S. H. (2008). Mental toughness, optimism, pessimism, and coping among athletes. *Personality and Individual Differences*, *44*(5), 1182–1192. https://doi.org/10.1016/j.paid.2007.11.011

Niemiec, R., Rashid, T., & Spinella, M. (2012). Strong mindfulness: Integrating mindfulness and character strengths. *Journal of Mental Health Counseling*, *34*(3), 240–253. https://doi.org/10.17744/mehc.34.3.34p6328x2v204v21

Oettingen, G., Kappes, H. B., Guttenberg, K. B., & Gollwitzer, P. M. (2015). Self-regulation of time management: Mental contrasting with implementation intentions. *European Journal of Social Psychology*, *45*(2), 218–229. https://doi.org/10.1002/ejsp.2090

Papies, E. K., Pronk, T. M., Keesman, M., & Barsalou, L. W. (2015). The benefits of simply observing: Mindful attention modulates the link between motivation and behavior. *Journal of Personality and Social Psychology*, *108*(1), 148–170. https://doi.org/10.1037/a0038032

Pavlova, M. K., & Silbereisen, R. K. (2013). Dispositional optimism fosters opportunity-congruent coping with occupational uncertainty. *Journal of Personality*, *81*(1), 76–86. https://doi.org/10.1111/j.1467-6494.2012.00782.x

Petchsawang, P., & McLean, G. N. (2017). Workplace spirituality, mindfulness meditation, and work engagement. *Journal of Management, Spirituality & Religion*, *14*(3), 216–244. https://doi.org/10.1080/14766086.2017.1291360

Peterson, C., & Park, N. (2003). Positive psychology as the evenhanded positive psychologist views it. *Psychological Inquiry*, *14*(2), 143–147.

Peterson, C., & Seligman, M. E. (2004). *Character strengths and virtues: A handbook and classification*, Vol. *1*. Oxford University Press.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, *63*, 539–569. https://doi.org/10.1146/annurev-psych-120710-100452

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*(4), 717–731. https://doi.org/10.3758/bf03206553

Pronin, E., Wegner, D. M., McCarthy, K., & Rodriguez, S. (2006). Everyday magical powers: The role of apparent mental causation in the overestimation of personal influence. *Journal of Personality and Social Psychology*, *91*(2), 218–231. https://doi.org/10.1037/0022-3514.91.2.218

Randall, J. G., Beier, M. E., & Villado, A. J. (2019). Multiple routes to mind wandering: Predicting mind wandering with resource theories. *Consciousness and Cognition*, *67*, 26–43. https://doi.org/10.1016/j.concog.2018.11.006

Randall, J. G., Oswald, F. L., & Beier, M. E. (2014). Mind-wandering, cognition, and performance: A theory-driven meta-analysis of attention regulation. *Psychological Bulletin*, *140*(6), 1411–1431. https://doi.org/10.1037/a0037428

Reina, C. S., & Kudesia, R. S. (2020). Wherever you go, there you become: How mindfulness arises in everyday situations. *Organizational Behavior and Human Decision Processes*, *159*, 78–96. https://doi.org/10.1016/j.obhdp.2019.11.008

Rosenstreich, E. (2016). Mindfulness and false-memories: The impact of mindfulness practice on the DRM paradigm. *The Journal of Psychology*, *150*(1), 58–71. https://doi.org/10.1080/00223980.2015.1004298

Rosenstreich, E., & Ruderman, L. (2017). A dual-process perspective on mindfulness, memory, and consciousness. *Mindfulness*, *8*(2), 505–516. https://doi.org/10.1007/s12671-016-0627-4

Rothbard, N. P. (2001). Enriching or depleting? The dynamics of engagement in work and family roles. *Administrative Science Quarterly*, *46*(4), 655–684. https://doi.org/10.2307/3094827

Schaufeli, W. B., & Bakker, A. B. (2010). Defining and measuring work engagement: Bringing clarity to the concept. In A. B. Bakker & M. P. Leiter (Eds.), *Work engagement: A handbook of essential theory and research* (pp. 10–24). Psychology Press.

Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement*, *66*(4), 701–716. https://doi.org/10.1177/0013164405282471

Schaufeli, W. B., Shimazu, A., Hakanen, J., Salanova, M., & De Witte, H. (2017). An ultra-short measure for work engagement: The UWES-3 validation across five countries. *European Journal of Psychological Assessment*, *35*(4), 577–591. https://doi.org/10.1027/1015-5759/a000430

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology*, *4*(3), 219–247. https://doi.org/10.1037/0278-6133.4.3.219

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, *67*(6), 1063–1078. https://doi.org/10.1037/0022-3514.67.6.1063

Segerstrom, S. C. (2006). *Breaking Murphy's law*. Guilford.

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

Sharot, T. (2011). The optimism bias. *Current Biology*, *21*(23), R941–R945. https://doi.org/10.1016/j.cub.2011.10.030

Shepperd, J. A., Pogge, G., & Howell, J. L. (2017). Assessing the consequences of unrealistic optimism: Challenges and recommendations. *Consciousness and Cognition*, *50*, 69–78. https://doi.org/10.1016/j.concog.2016.07.004

Siegel, R. D. (2010). *The mindful solution: Everyday practices for everyday problems*. Guilford Press.
Smallwood, J., & Schooler, J. W. (2006). The restless mind. *Psychological Bulletin*, *132*(6), 946–958. https://doi.org/10.1037/0033-2909.132.6.946
Spencer, S. J., Zanna, M. P., & Fong, G. T. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology*, *89*(6), 845–851. https://doi.org/10.1037/0022-3514.89.6.845
Sutcliffe, K. M., Vogus, T. J., & Dane, E. (2016). Mindfulness in organizations: A cross-level review. *Annual Review of Organizational Psychology and Organizational Behavior*, *3*, 55–81. https://doi.org/10.1146/annurev-orgpsych-041015-062531
Sweeny, K., Carroll, P. J., & Shepperd, J. A. (2006). Is optimism always best? Future outlooks and preparedness. *Current Directions in Psychological Science*, *15*(6), 302–306. https://doi.org/10.1111/j.1467-8721.2006.00457.x
Tenney, E. R., Logg, J. M., & Moore, D. A. (2015). (Too) optimistic about optimism: The belief that optimism improves performance. *Journal of Personality and Social Psychology*, *108*(3), 377–399. https://doi.org/10.1037/pspa0000018
Tuckey, M. R., Sonnentag, S., & Bryan, J. (2018). Are state mindfulness and state work engagement related during the workday? *Work & Stress*, *32*(1), 1–16. https://doi.org/10.1080/02678373.2017.1420707
van Berkel, J., Boot, C. R. L., Proper, K. I., Bongers, P. M., & van der Beek, A. J. (2014). Effectiveness of a worksite mindfulness-related multi-component health promotion intervention on work engagement and mental health: Results of a randomized controlled trial. *PLoS One*, *9*(1), e84118. https://doi.org/10.1371/journal.pone.0084118
Van Damme, S., Crombez, G., Goubert, L., & Eccleston, C. (2009). The costs and benefits of self-regulation—A call for experimental research. *Psychology & Health*, *24*, 367–371. https://doi.org/10.1080/08870440902866902
Wenk-Sormaz, H. (2005). Meditation can reduce habitual responding. *Alternative Therapies in Health and Medicine*, *11*(2), 32–58.
Wheeler, A. R., Shanine, K. K., Leon, M. R., & Whitman, M. V. (2014). Student-recruited samples in organizational research: A review, analysis, and guidelines for future research. *Journal of Occupational and Organizational Psychology*, *87*(1), 1–26. https://doi.org/10.1111/joop.12042
Wilson, B. M., Mickes, L., Stolarz-Fantino, S., Evrard, M., & Fantino, E. (2015). Increased false-memory susceptibility after mindfulness meditation. *Psychological Science*, *26*(10), 1567–1573. https://doi.org/10.1177/0956797615593705
Winning, A. P., & Boag, S. (2015). Does brief mindfulness training increase empathy? The role of personality. *Personality and Individual Differences*, *86*, 492–498. https://doi.org/10.1016/j.paid.2015.07.011
Wrosch, C., & Scheier, M. F. (2003). Personality and quality of life: The importance of optimism and goal adjustment. *Quality of Life Research*, *12*(1), 59–72. https://doi.org/10.1023/A:1023529606137
Young, H. R., Glerum, D. R., Wang, W., & Joseph, D. L. (2018). Who are the most engaged at work? A meta-analysis of personality and employee engagement. *Journal of Organizational Behavior*, *39*(10), 1330–1346. https://doi.org/10.1002/job.2303

How to cite this article: Bunjak, A., Hafenbrack, A. C., Černe, M., & Arendt, J. F. W. (2022). Better to be optimistic, mindful, or both? The interaction between optimism, mindfulness, and task engagement. *Journal of Occupational and Organizational Psychology*, *95*, 595–623. https://doi.org/10.1111/joop.12389

APPENDIX 1

AN EXAMPLE OF THE IDEAS RATED HIGH IN QUALITY/QUANTITY (STUDY 2)

An example of an idea rated high in quality includes: 'You can use this fork to help you propel yourself whilst sat on a skateboard. Simply sit on the stakeboard, and use the fork a little like a paddle on a boat. However, unlike a paddle in water, the fork is used to stab the ground in front of you, then you pull back, meaning you and the skateboard are propelled forward. This could be an option for people without legs'.

An idea high in quantity includes: 'A common problem for homeowners is other people's animals, particularly pet cats, coming in their garden. They can easily jump onto fence and down into your garden, using your lawn as a toilet and digging up your flower beds. Use this elegant fork solution, which positions them atop your fences, prong side up, preventing cats from being able to jump on the fence without getting their bottoms spiked (cats are intelligent creatures and won't even try it). These look elegant and shiny in the sun, and because they are stainless steel, they won't corrode in the rain. Try this elegant and practical solution today – available to buy in packs of twenty!'.

APPENDIX 2

BLOG ENTRY STIMULI (STUDY 3)

'They say the good die young, and that the foolish die early. When judging Amy Whinehouse's life, I'm inclined at first to say the latter with her. But as I think about it more, I find that neither cliché really applies here. The heroin drinking, meth blunt smoking, Ketamine inhaling songstress was by no means good, but at the same I time I'm weary to label her as foolish. (Fact: Smokey the Bear has his own zip code: 20252) We so often say that when a person turns to drugs that this person is broken (which is often the case). One doesn't get the feeling this is the case, though, with Whinehouse. She had from all accounts a great relationship with her father and was financially set at a young age. She is an example of someone who just loved drugs. She's one of those rare girls who could hang with the boys—in fact probably roll harder than any of them. This is why she is not foolish. Anyone who does drugs as hard as Whinehouse did knows full well of their effect. It's a fine line that any user knowingly walks. (Fact: that line has a fineness of 2 feet).

Her death raises the question as all deaths for people who die at an early age: Is her death tragic? When someone seemingly so pre-destined for an early demise dies, it's not tragic. What have we really lost here? Her best days were behind her. It seemed improbable that she would put out anything more than a mediocre single (and nothing as good as "Rehab"). So with her best days behind her, we have not lost a great talent. No, when Amy Whinehouse died, Hedonism lost one of its best soldiers'.

APPENDIX 3

AN EXAMPLE OF THE IDEAS RATED HIGH IN QUALITY/QUANTITY (STUDY 3)

An example of an idea rated high in quality includes: 'Accuracy? I cannot evaluate all the things written in the blog, so I am neutral. Well-written? Not so much, it is pretty much judgmental without suitable facts. Informative? It is informative but maybe more about the author him/herself. My message to the author – stop writing about other people using them as a platform for your own frustration healing'.

An idea high in quantity includes: 'The blog entry lacks clarity and it is really hard to figure out what the author was trying to say. It is like he/she was just skipping some parts or even brainstorming at some point. The article has many spelling mistakes; it was confusing and too subjective. It was difficult for me to understand the message the author wanted to convey. I thought that two paragraphs were written by two different authors because there seem to be two different opinions. I did not understand the references – Smokey the Bear has his own zip code: 20252'.

APPENDIX 4

AN EXAMPLE OF THE IDEAS RATED HIGH IN QUALITY/QUANTITY (STUDY 4)

An example of an idea rated high in quality was: 'The idea is called – Visiting Kitchen: a group of five students would be taken to the faculty's kitchen where they would get various tasks like dish-washing, making coffee or tea, delicious sandwiches, cutting vegetables, etc. This would make them team up right away, both among themselves and with the faculty stuff which would help them to feel like a part of the faculty and part of the group with other international student fellows. After the time of preparing the meal, they would eat together which would give them the opportunity to get to know each other even better and to feel connected with the new colleagues and the Faculty itself'.

An idea high in quantity was: 'The party would be held outside, in the faculty's yard, and would start at 6 pm. In the yard, students would be able to find a big whiteboard with their names and post-it notes beside their names. The note would have some fanny but learning message on it and a badge where students could write their name and describe themselves with three to five personal characteristics

that describe them the best. Also, the post-it note would have guidelines for every student to go to one of the three-party stages organized especially for international students. The idea would be for all students to go through all the stages with the purpose to get to know each other in smaller groups and at the end (approx. 2 hours later) they would gather again at the one big stage in yard for a 'classical' party with a DJ'.