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Mindfulness and Work Engagement Among Hybrid Employees: A Closer Look

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Abstract

This study investigates the relationship between mindfulness and work engagement, analysed through its three dimensions: vigour, dedication, and absorption, among employees working in a hybrid model. This quantitative study used the CAWI method to collect 186 surveys from full-time Polish hybrid workers in April 2024. The results reveal a U-shaped relationship between mindfulness and work engagement. The same nature of the relationship applies to both the phenomenon of "work engagement" analysed as a whole and its individual dimensions. Initial increases in mindfulness are associated with a decline in work engagement, possibly because greater awareness of competing demands is not yet accompanied by sufficient attentional control. However, at higher levels of mindfulness, the relationship becomes positive and increasingly stronger, leading to an accelerating enhancement in employees' ability to concentrate, focus, and fully engage in their work. The study highlights the potential of mindfulness as a personal resource supporting work engagement in hybrid work settings.

Keywords

Mindfulness, Work Engagement, Hybrid Work

I. Introduction

Mindfulness is the intentional, non-judgmental focus on the present moment, viewed both as a skill and a way of life (Bishop, 2004). It can be developed through formal practices like meditation and informal awareness in daily tasks (Hülsheger, 2015). Though initially demanding (Lymeus et al., 2017), sustained mindfulness enhances attentional control and

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reduces automatic reactions (Bartlett et al., 2021). By deepening awareness, it fosters greater engagement and absorption in activities (Brown and Ryan, 2003). This is especially relevant in remote work settings, where maintaining focus amid distractions is a growing challenge (Pattnaik and Jena, 2020).

Remote work expanded rapidly during the COVID-19 pandemic, prompting studies on its pros and cons for both employers and employees (e.g. Ferreira et al., 2021; Ipsen et al., 2021). A key challenge was managing distractions in the home environment, which reduced focus (Waizenegger et al., 2020). In Central European research, telework has also been examined primarily from an organisational and economic perspective, including its links with productivity and firm characteristics (Vlčková et al., 2019). In the post-pandemic era, hybrid work, blending remote and in-office tasks, has become a standard model. While it offers flexibility and work-life balance (Santillan et al., 2023), frequent switching between settings can cause cognitive overload and lower focus, engagement, and performance (Rietveld, 2012). More broadly, digitalisation is transforming employees' tasks and competency requirements (Petrová, 2022). In this context, mindfulness is especially valuable, helping hybrid workers maintain attention and stay engaged across changing work environments.

Work engagement is a desirable state for employers. Work engagement, defined as a positive and fulfilling state of mind, comprises three core dimensions: vigour, dedication, and absorption (Schaufeli and Bakker, 2010). Vigour reflects energy and resilience, dedication involves pride and purpose, and absorption refers to deep focus. Research has consistently shown that work engagement is a key factor in fostering productivity and well-being in the workplace (Hakanen et al., 2019). While well studied in traditional and remote settings, its dynamics in hybrid work models insufficiently studied (Li et al., 2023).

Although some research efforts have explored the link between mindfulness and work engagement (e.g. Gunasekara and Zheng, 2019; Malinowski and Lim, 2015), the specific ways in which mindfulness impacts the work engagement in hybrid work context remain unexplored. This study aims to address this gap by empirically examining the relationship between mindfulness and work engagement, analysed through its three dimensions: vigour, dedication, and absorption, among employees working in a hybrid model.

In line with the identified research gap, the present study addresses the following research questions:

RQ1: What is the relationship between mindfulness and work engagement among employees working in a hybrid model?

RQ2: How is mindfulness related to the individual dimensions of work engagement, namely vigour, dedication, and absorption, in a hybrid work context?

Given conceptual perspectives suggesting that mindfulness-related processes may not always follow strictly linear patterns (Britton, 2019; Choi et al., 2022; Grant and Schwartz, 2011), the study additionally examines whether these relationships may be U-shaped in nature.

II. Theoretical Background

Mindfulness in the context of working from home

Mindfulness is commonly understood as present-moment awareness without judgment (Sutcliffe et al., 2016). Carlson (2013) defines it as non-evaluative attention to current experience, while Ruedy and Schweitzer (2010) describe it as awareness of both internal thoughts and the external environment. The authors follow Brown and Ryan's (2003) approach, defining mindfulness as present-centred attention and awareness. This moment-to-moment awareness is also central to the concept adopted in this study.

Although humans naturally possess the ability to focus on the present, the intensity of this awareness varies between individuals and over time (Brown and Ryan, 2003). Mindfulness contrasts with distracted, automatic states where attention drifts from the present (Baas et al., 2014). A mindful person can observe both external events and internal experiences with clarity and self-awareness (Sawyer et al., 2022). Regular mindfulness practice fosters direct awareness, reduces automatic reactions, and supports more flexible, conscious responses to the world (Brown et al., 2007).

Given its benefits, interest in mindfulness grew during the COVID-19 pandemic (Al et al., 2023; Deshpande et al., 2024; Toniolo-Barrios and Pitt, 2021; Vione and Kotera, 2023). Mindfulness has been shown to ease challenges of working from home (Ioannou et al., 2024). Recent findings further indicate that trait mindfulness, particularly nonreactivity, may buffer the adverse effects of telecommuting on home-to-work interference (Hülsheger et al., 2025). Deshpande et al. (2024) found that those with mindfulness training manage emotions better, improving performance. Al et al. (2023) showed that just 10 minutes of daily practice can enhance well-being and creativity. Vione and Kotera (2023) reported that mindfulness helped remote workers maintain emotional balance and cope with loneliness.

Work engagement in digitally mediated work environments

Work engagement is a positive, fulfilling state of mind at work, defined by vigour, absorption, and dedication. Vigour reflects energy and resilience, absorption involves deep focus and enthusiasm, while dedication relates to a sense of meaning and inspiration in one's tasks (Schaufeli and Bakker, 2010). According to the Job Demands-Resources (JD-R) Theory, work engagement emerges when employees have access to sufficient job resources that help them cope with job demands. Previous studies have shown that work engagement benefits both employees and employers, serving as a key factor in fostering a healthy and thriving workplace (Hakanen et al., 2019).

Research suggests that hybrid work positively influences work engagement. However, recent daily-diary evidence indicates that work engagement may also depend on the specific work location, with higher daily engagement observed when employees worked remotely outside both the home and the office (Apenbrink and Kuhlmann, 2026). Teleworkers report higher engagement than those in traditional office settings (Miglioretti et al., 2021). Studies also show that working from home enhances concentration, boosting engagement and performance. However, it can also increase feelings of isolation, which may reduce engagement (Toscano et al., 2024). Empirical studies show that greater autonomy in hybrid

work boosts engagement (Monje-Amor, 2024). Leadership and organisational support also reduce stress and enhance engagement (Deepa and Dharshini, 2024). While hybrid workers benefit from home-based support and personal resources, external support remains essential. However, work-family conflict has a stronger negative impact on engagement than the positive effects of organisational support in reducing technostress (Harunavamwe and Kanengoni, 2023).

Relationship between mindfulness and work engagement

Kahn (1990, 1992) argued that work engagement stems from psychological presence, understood as being fully attentive, open, and self-aware in the moment. This aligns with mindfulness, which enhances focus and presence, fostering deeper involvement in tasks (Brown and Ryan, 2003). Research suggests that mindfulness is supported by authentic functioning, promoting engagement through self-awareness and value-consistent behaviour (Coo and Salanova, 2018). Consistent with the JD-R Theory, mindfulness may therefore be understood as a personal resource that enhances psychological presence, supports authentic functioning, and strengthens employees' ability to cope with job demands, thereby fostering work engagement (Janssen et al., 2020; Krick et al., 2023). The JD-R Theory distinguishes between a health-impairment process, in which excessive job demands deplete employees' energy, and a motivational process, in which job and personal resources foster engagement (Bakker et al., 2023). In hybrid work, mindfulness may contribute to the motivational process by helping employees manage digital interruptions, work-family interference, and transitions between work settings.

Empirical studies consistently demonstrate a positive relationship between mindfulness and work engagement. Mindfulness supports attentional control, acceptance, and stress reduction, thereby strengthening engagement and functioning as a valuable personal resource (Bartlett et al., 2021; Gunasekara and Zheng, 2019; Petchsawang and McLean, 2017). From the perspective of Self-Regulation Theory, employees regulate their behaviour by monitoring their current state, comparing it with desired goals, and adjusting their attention and actions accordingly (Inzlicht et al., 2021). Mindfulness may facilitate this process by increasing awareness of attentional lapses and enabling employees to redirect attention towards work-related goals.

An alternative perspective suggests that mindfulness may not operate as a uniformly linear resource. Britton (2019) and Choi et al. (2022) emphasised that the effects of mindfulness may depend on its level and the context in which it occurs. More broadly, organisational research indicates that beneficial psychological states and resources may produce non-monotonic effects rather than follow a simple "more-is-better" pattern (Grant and Schwartz, 2011; Pierce and Aguinis, 2013).

Taken together, the JD-R Theory, Self-Regulation Theory, and Cognitive Load Theory provide a theoretical basis for considering whether the relationship between mindfulness and work engagement may be U-shaped. Mindfulness involves the regulation of attention and awareness of present experience (Bishop, 2004; Brown and Ryan, 2003). Cognitive Load Theory assumes that working-memory capacity is limited and that competing demands may consume the cognitive resources required for effective task performance (van

Merrienboer and Sweller, 2010). This constraint may be particularly relevant in hybrid work, where employees must divide their attention between work tasks, digital communication, domestic demands, and changing work environments. At lower levels of mindfulness, initial increases in present-moment monitoring may heighten employees' awareness of distractions, work-family interference, and competing demands without yet providing sufficient attentional control to manage them effectively. This increased monitoring may temporarily consume cognitive resources that could otherwise be invested in work, thereby weakening vigour, dedication, and absorption.

At higher levels, however, mindfulness may support more effective attention regulation, reduce automatic reactions, and enable employees to respond more flexibly to work demands (Bartlett et al., 2021; Brown et al., 2007). From a self-regulation perspective, employees may become more effective at identifying attentional deviations and redirecting their cognitive resources towards work goals. Mindfulness may also reduce the cognitive load generated by automatic reactions, rumination, and repeated task switching. Consistent with the JD-R Theory, mindfulness may then function as a personal resource that strengthens employees' capacity to cope with demands and promotes work engagement (Janssen et al., 2020; Krick et al., 2023). Accordingly, the relationship between mindfulness and work engagement is expected to be U-shaped rather than strictly linear.

Accordingly, the following hypotheses were formulated:

H1. Mindfulness has a U-shaped relationship with overall work engagement, such that work engagement initially decreases as mindfulness increases but rises at higher levels of mindfulness.

H2. Mindfulness has a U-shaped relationship with vigour, such that vigour initially decreases as mindfulness increases but rises at higher levels of mindfulness.

H3. Mindfulness has a U-shaped relationship with dedication, such that dedication initially decreases as mindfulness increases but rises at higher levels of mindfulness.

H4. Mindfulness has a U-shaped relationship with absorption, such that absorption initially decreases as mindfulness increases but rises at higher levels of mindfulness.

III. Methods and sample

Each construct discussed in the theoretical section of the paper was measured using established research tools created and validated by experts in their respective research areas. We adopted the Mindful Attention Awareness Scale (MAAS) by Brown and Ryan (2003) to measure mindfulness, and the Work Engagement Scale (UWES) by Schaufeli, Bakker, and Salanova (2003) to assess work engagement.

The survey was conducted in April 2024 using the Computer-Assisted Web Interviewing (CAWI) method through Ariadna[4], a nationwide Polish research panel specialising in

[4] Ariadna, a Polish research platform, is certified under the Interviewer Quality Control Program (PKJPA) by the Polish Association of Public Opinion and Market Research Firms (PSF). This certification confirms that Ariadna adheres to established quality and methodological standards for conducting market and social research in Poland. Ariadna also operates in accordance with the principles of the ICC/ESOMAR International Code on Market, Opinion and Social Research and Data Analytics (Nationwide Research Panel Ariadna, 2026).

online and management research. The survey procedure and its reporting followed the applicable recommendations of the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) (Eysenbach, 2004) and the Consensus-Based Checklist for Reporting of Survey Studies (CROSS) (Sharma et al., 2021). The sampling frame consisted of adult members of the Ariadna online research panel residing in Poland and aged 18 years or above. Participants' identities are verified by Ariadna in accordance with the company's Personal Data Protection Policy for members of the Ariadna research panel. The study was conducted in accordance with ethical standards and received approval from an institutional Research Ethics Committee. All participants were informed that their participation was voluntary and that they could withdraw from the study at any time. The present study formed part of a larger research project involving both remote and hybrid employees. The analysis reported in this study focused exclusively on employees working in a hybrid work arrangement. The target population comprised adults who, at the time of the survey, regularly performed their work both remotely and at their employer's premises. No more specific eligibility criteria, such as a minimum number of days worked remotely or on-site, were applied. Purposive sampling was used to recruit participants who met the eligibility criteria for the broader project. Additional inclusion criteria were full-time employment and the provision of informed consent. Full-time employment was defined as working eight hours per day and 40 hours per week. Under the Polish Labour Code, these hours are typically distributed over a five-day working week, usually from Monday to Friday (Ministry of Economic Development Labour and Technology, 2026). Taken together, the purposive sampling criteria included being at least 18 years old, residing in Poland, being employed full-time, working in a hybrid arrangement, regularly working both remotely and at the employer's premises, and providing informed consent to participate in the study. The exclusion criteria included working exclusively remotely or exclusively on-site, being employed part-time, being unemployed, declining to provide informed consent, or withdrawing consent during the study.

The initial sample consisted of 322 employees working either remotely or in a hybrid model. For the purposes of the present study, employees working exclusively from home were excluded ($n = 73$), as the analysis focused specifically on hybrid work arrangements. Next, only full-time employees were retained, resulting in the exclusion of 63 part-time employees. This restriction increased the comparability of observations and reduced heterogeneity in working-time patterns. In line with the aims of the study and to ensure internal consistency and analytical reliability, the final econometric analysis was conducted on a sample of 186 full-time employees working in a hybrid model. Before conducting the empirical analysis, the internal consistency of the scales used in the study was assessed using Cronbach's alpha (Table 1).

The gender distribution of the respondents was nearly equal, with men slightly outnumbering women (51.61% men, 48.39% women, 0.00% other). Most respondents had at least a bachelor's degree (74.73%), and the most common job level was specialist/independent

(59.13%). The managers comprised 29.03% of the sample. The majority of respondents were employed in the services sectors (77.42%)[5].

The study used a non-probability sampling procedure. Respondents were recruited based on accessibility and willingness to participate in the survey. Therefore, the sample should not be interpreted as representative of the general population. This limitation is taken into account when interpreting the results.

Altogether 186 responses were collected. The data were independently screened by two researchers for completeness, internal consistency, and coding errors. For the analysis, we utilized Jupyter Notebook (version 6.4.5) and Python (version 3.9.7), along with the following packages: NumPy (1.22.4), pandas (2.1.4), SciPy (1.13.1), statsmodels (0.14.1), and semopy (2.3.9).

Reliability and validity

Confirmatory Factor Analysis was conducted to evaluate the reliability and validity of the measurement model, which included four key constructs. The constructs were assessed from different perspectives, including factor loadings (FL > 0.6) (Awang, 2012; Hair et al., 2010), Cronbach's alpha, composite reliability (Cα and CR > 0.70) (Flynn et al., 2010), and Average Variance Extracted (AVE > 0.50) (Chau, 1997). The summary of the relevant estimates is presented in Table 1 below.

Table 1: Cronbach's α and Confirmatory Factor Analysis (CFA) results

Construct	n	Cα	CR	AVE	FL_{min}	FL_{max}
MAAS	15	0.947	0.947	0.548	0.543	0.837
UWES	9	0.933	0.934	0.617	0.555	0.883
UWES_ABS	3	0.774	0.775	0.539	0.592	0.822
UWES_DED	3	0.840	0.838	0.635	0.697	0.865
UWES_VIG	3	0.902	0.902	0.755	0.843	0.895

Source: Own study

All constructs demonstrated strong internal consistency, as evidenced by the Cronbach's alpha (Cα) and composite reliability (CR) values. All constructs showed adequate convergent validity with AVE values above the 0.5 threshold. Factor Loading are slightly below threshold for MAAS and UWES in aggregate, however it does not seem to materially impact the inference process.

[5] Characteristics of the original sample (n = 322). Gender distribution: men: 51.86%, women: 48.14%, other: 0.00%. Educational attainment: primary education: 0.93%, secondary education: 29.81%, at least a bachelor's degree: 69.26%. Job level: operational/non-managerial positions: 16.46%, specialists or independent professionals: 59.63%, lower-level management positions involving responsibility for managing employees: 8.39%, middle-management positions involving responsibility for managing employees and resources: 7.76%, senior management positions involving strategic decision-making: 7.76%. Overall, managers accounted for 23.91% of the original sample. Sector distribution: Other service activities: 65 respondents (20.19%), Financial and insurance activities: 30 respondents (9.32%), Professional, scientific, and technical activities: 29 respondents (9.00%), Information and communication: 27 respondents (8.39%), Education: 26 respondents (8.07%), Wholesale and retail trade; repair of motor vehicles and motorcycles: 22 respondents (6.83%), Transportation and storage: 16 respondents (4.97%), Human health and social work activities: 15 respondents (4.66%), Other sectors: 92 respondents (28.57%).

IV. Results

For the modelling, we used ordinary least squares regression. The initial analysis examined the linear association between mindfulness and work engagement. Because the linear specification did not adequately capture the observed relationship, an exploratory quadratic specification was subsequently estimated. Following methodological recommendations for analysing U-shaped relationships, the shape of the relationship was evaluated jointly using the quadratic term, the estimated turning point, and the slopes on both sides of the turning point (Haans et al., 2016). Heteroskedasticity-consistent HC2 standard errors were used for statistical inference (MacKinnon and White, 1985), and non-parametric bootstrap estimates based on 10,000 resamples were calculated as a robustness analysis (Efron, 1979). We assumed a significance level of 0.05.

Descriptive statistics for the study variables and selected characteristics of their distributions are presented in Table 2.

Table 2: Descriptive statistics of distributions of measured constructs

Construct	Mean	SD	Median	JB	p-value	Skew	Kurtosis
MAAS	4.0104	0.9892	4.1333	6.4221	0.0403	−0.4489	3.1505
UWES	3.5191	1.1369	3.5556	18.3268	0.0001	−0.4354	4.2674
UWES_VIG	3.3817	1.3205	3.3333	7.0572	0.0293	−0.4338	3.3972
UWES_DED	3.7043	1.2102	3.6667	10.1823	0.0062	−0.4058	3.8094
UWES_ABS	3.4713	1.1519	3.3333	14.6033	0.0007	−0.3583	4.1708

Source: Own study

Note: Mean = arithmetic mean; SD = standard deviation; Median = middle value of the ordered data; JB = Jarque-Bera test statistic; p-value = p-value; Skew = skewness; Kurtosis = kurtosis

The distribution of MAAS scores was moderately negatively skewed, indicating a longer lower tail and a greater concentration of observations in the upper part of the scale. The reported kurtosis value of 3.1505 corresponds to an excess kurtosis of 0.1505 and is therefore close to that of a normal distribution. Nevertheless, the Jarque-Bera test (Jarque and Bera, 1987) rejected the null hypothesis of normality at the 0.05 significance level, JB = 6.422 (p = 0.040).

The distributions of the overall UWES score and its dimensions were also negatively skewed. Their kurtosis values exceeded 3, indicating positive excess kurtosis and heavier tails than those of a normal distribution. The Jarque-Bera tests rejected normality for the overall UWES score and all three dimensions.

The initial linear models did not provide evidence of statistically significant linear associations between mindfulness and work engagement. Inspection of the residuals from the linear models indicated systematic curvature, suggesting that the linear specification did not adequately represent the observed relationships. We therefore estimated exploratory quadratic models including both the linear MAAS term and its squared term.

Heteroskedasticity-consistent HC2 standard errors were used for the primary statistical inference. Non-parametric bootstrap results based on 10,000 resamples are reported in parentheses as a robustness analysis.

Table 3: Estimated models of work engagement and its dimensions

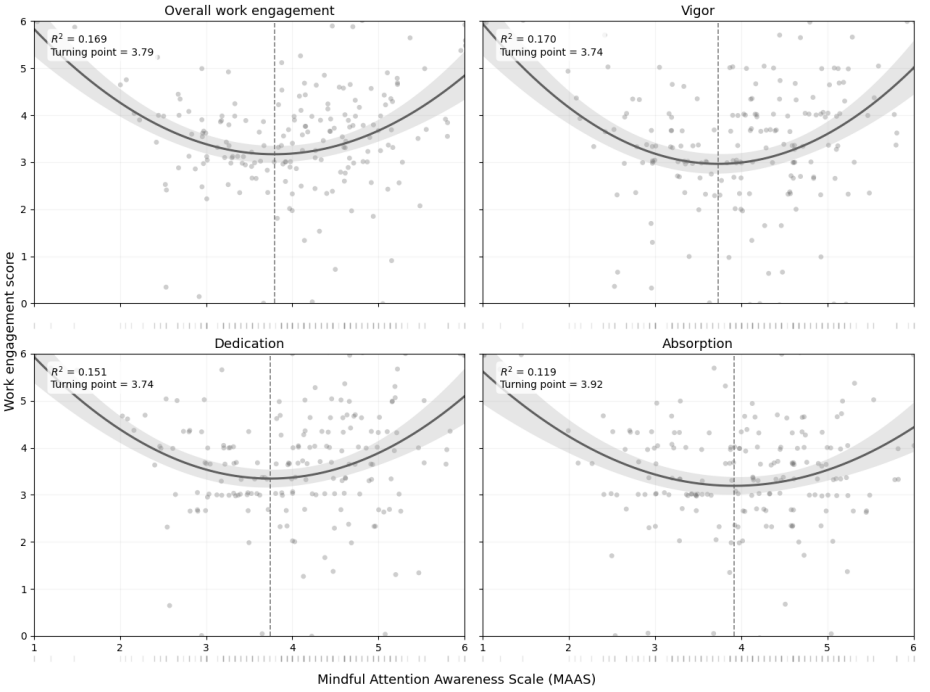
	Estimate	SE	t-value	p-value	95% Confidence Interval	
					Lower	Upper
UWES ~						
Intercept	8.0970 (8.0658)	0.530 (0.435)	15.279 (18.547)	<0.001 (< 0.001)	7.051 (7.120)	9.143 (8.850)
MAAS²	0.3431 (0.3411)	0.041 (0.033)	8.338 (10.349)	<0.001 (< 0.001)	0.262 (0.271)	0.424 (0.403)
MAAS	−2.6008 (−2.5846)	0.297 (0.241)	−8.745 (−10.723)	<0.001 (< 0.001)	−3.188 (−3.029)	−2.014 (−2.071)
R^2 0.169	**Adj. R^2** 0.16	**F-statistic** 38.50	**(p-value)** (< 0.001)	**DW** 2.165	**JB** 56.324	**(p-value)** (< 0.001)
UWES_VIG ~						
Intercept	8.5291 (8.5117)	0.620 (0.507)	13.749 (16.772)	<0.001 (< 0.001)	7.305 (7.484)	9.753 (9.480)
MAAS²	0.3983 (0.3970)	0.047 (0.037)	8.525 (10.594)	<0.001 (< 0.001)	0.309 (0.321)	0.490 (0.469)
MAAS	−2.9775 (−2.9681)	0.343 (0.278)	−8.693 (−10.690)	<0.001 (< 0.001)	−3.581 (−3.501)	−2.302 (−2.408)
R^2 0.17	**Adj. R^2** 0.161	**F-statistic** 37.84	**(p-value)** (< 0.001)	**DW** 2.197	**JB** 25.169	**(p-value)** (< 0.001)
UWES_ABS ~						
Intercept	7.5867 (7.5346)	0.628 (0.512)	12.082 (14.706)	<0.001 (< 0.001)	6.348 (6.375)	8.826 (8.404)
MAAS²	0.2864 (0.2831)	0.046 (0.036)	6.268 (7.801)	<0.001 (< 0.001)	0.196 (0.205)	0.377 (0.349)
MAAS	−2.2442 (−2.2175)	0.340 (0.274)	−6.596 (−8.094)	<0.001 (< 0.001)	−2.915 (−2.706)	−1.573 (−1.616)
R^2 0.119	**Adj. R^2** 0.109	**F-statistic** 22.02	**(p-value)** (< 0.001)	**DW** 2.174	**JB** 32.971	**(p-value)** (< 0.001)
UWES_DED ~						
Intercept	8.1751 (8.1510)	0.526 (0.432)	15.549 (18.860)	<0.001 (< 0.001)	7.138 (7.232)	9.212 (8.951)
MAAS²	0.3447 (0.3431)	0.044 (0.035)	7.810 (9.763)	<0.001 (< 0.001)	0.258 (0.271)	0.432 (0.41)
MAAS	−2.5808 (−2.5682)	0.308 (0.249)	−8.370 (−10.319)	<0.001 (< 0.001)	−3.189 (−3.039)	−1.972 (−2.057)
R^2 0.151	**Adj. R^2** 0.142	**F-statistic** 36.13	**p-value** (< 0.001)	**DW** 2.149	**JB** 36.749	**p-value** (< 0.001)

Source: Own study

Notes: 1) OLS estimator, 2) heteroskedasticity-consistent HC2 standard errors, 3) bootstrap estimates in parentheses, based on 10,000 resamples, non-parametric CIs, 4) R^2 coefficient of determination

The positive and statistically significant coefficients of the squared MAAS term indicate upward curvature in the estimated relationships between mindfulness and overall work engagement and its dimensions. MAAS was entered into the models on its original 1–6 scale and was not mean-centered before calculating the squared term. Consequently, the coefficient of the linear MAAS term represents the estimated slope at MAAS = 0, which lies outside the observed scale and has no substantive interpretation in the present study. The linear and quadratic coefficients should therefore not be interpreted separately. At any observed level of mindfulness, the slope of the association is given by $b_1 + 2b_2 \times MAAS$. To facilitate interpretation of the estimated non-linear relationships, the observed data were plotted together with the fitted quadratic regression curves and their 95% confidence intervals for overall work engagement, vigour, dedication, and absorption (Figure 1).

Figure 1: Observed and fitted quadratic associations of mindfulness with overall work engagement and its dimensions



Source: Own study

Note: Solid lines represent fitted quadratic regression curves, and shaded areas represent HC2-based 95% confidence bands for the estimated mean response. To reduce overplotting, a small amount of random jitter was added to the displayed observations. Jitter was used solely for visualization; all regression estimates, confidence intervals, turning points, and model-fit statistics were calculated using the original, unmodified data. The random jitter was generated using a fixed seed to ensure reproducibility.

The fitted functions were U-shaped. Predicted work engagement decreased as MAAS approached the estimated minimum and increased beyond that point. The estimated turning points were approximately 3.79 for overall work engagement, 3.74 for vigour, 3.92 for absorption, and 3.74 for dedication. These values indicate that the direction of the estimated association changed at moderate levels of mindfulness rather than only at the extreme upper end of the scale.

The use of the original, uncentered MAAS scale affects the interpretation of the individual regression coefficients but does not affect the fitted values, model fit, shape of the estimated curves, or location of the turning points. The results therefore suggest a non-linear association between mindfulness and work engagement. Because the data are cross-sectional, the coefficients should be interpreted as associations rather than as causal effects of mindfulness on engagement.

The quadratic models explained between 11.9% and 17.0% of the observed variance in overall work engagement and its dimensions. These values indicate modest explanatory power. Inference based on HC2 standard errors and the bootstrap analysis led to substantively consistent conclusions. The implications of the remaining unexplained variance are discussed in the Research limitations section.

Robustness analysis with demographic and occupational controls

Given the modest explanatory power of the original quadratic models, an additional robustness model was estimated for the overall UWES score to assess whether demographic and occupational characteristics explained additional variance and whether their inclusion materially affected the estimated quadratic association. (see Appendix 1). The model controlled for five demographic and occupational characteristics: occupational position, place of residence, age group, gender, and education. The control variables were treated as categorical because their numerical codes did not represent equally spaced measurement scales. As several variables contained more than two categories, the five characteristics were represented by a total of 15 indicator-variable coefficients.

In the robustness model, MAAS was mean-centered before calculating its squared term. This reparameterization improves the interpretation of the coefficients but does not change the fitted values, model fit, shape of the curve, or location of the turning point. The estimated turning point was subsequently converted back to the original 1–6 MAAS scale. Because only one respondent reported primary education, the primary- and secondary-education categories were combined into a single “secondary or lower” category before estimation. The joint contribution of the control variables was assessed using a heteroskedasticity-robust Wald F-test based on the HC2 covariance matrix. The turning point was calculated from the estimated linear and quadratic MAAS coefficients. To assess the direction of the relationship on both sides of the turning point, the slopes were evaluated at the 5th and 95th percentiles of the observed MAAS distribution. Their standard errors were calculated as linear combinations of the coefficient estimates using the HC2 covariance matrix. Two-sided Wald tests were used to assess whether the estimated slopes differed from zero, while the signs of the estimates indicated the direction of the relationships.

The inclusion of the control variables increased R^2 from 0.169 to 0.308 and adjusted R^2 from 0.160 to 0.238. The adjusted model was statistically significant, $F(17, 168) = 6.763$ ($p < 0.001$). The joint contribution of the control variables was statistically significant in a heteroskedasticity-robust Wald test based on the HC2 covariance matrix, $F(15, 168) = 2.105$ ($p = 0.012$). The quadratic MAAS term remained positive and statistically significant after adjustment, $b = 0.291$, SEHC2 = 0.052 ($t = 5.594$, $p < 0.001$, 95% CI [0.188, 0.394]). The estimated turning point was located at MAAS = 3.91, compared with 3.79 in the unadjusted model. The small difference between the two estimates indicates that the location of the minimum was not materially affected by the inclusion of the control variables.

The turning point was close to the sample mean of MAAS, (M = 4.01), and was located within the central part of its observed distribution. There were 76 respondents below and 110 respondents above the estimated turning point, indicating that both branches of the fitted curve were supported by substantial numbers of observations. At the 5th percentile of MAAS, corresponding to MAAS = 2.42, the estimated slope was negative and statistically significant, $b = -0.869$, SE = 0.157, ($t = -5.538$, $p < 0.001$). At the 95th percentile, corresponding to MAAS = 5.47, the estimated slope was positive and statistically significant, $b = 0.906$, SE = 0.210, ($t = 4.325$, $p < 0.001$). These results show that the estimated relationship was decreasing in the lower part of the MAAS distribution and increasing in its upper part.

The set of coefficients representing occupational position was jointly statistically significant, $F(4, 168) = 3.715$ ($p = 0.006$), as was the set representing education, $F(3, 168) = 2.842$ ($p = 0.039$). Age group, $F(4, 168) = 1.403$ ($p = 0.235$), gender, $F(1, 168) = 0.136$ ($p = 0.713$), and place of residence, $F(3, 168) = 0.495$ ($p = 0.686$), did not show statistically significant joint associations with the overall UWES score. Thus, among the included control variables, the clearest evidence of additional association with work engagement was observed for occupational position and education.

Research limitations

The explanatory power of the original quadratic models was modest. Mindfulness explained 16.9% of the variance in overall work engagement, 17.0% in vigour, 15.1% in dedication, and 11.9% in absorption. These models were intended to examine the form of the association between mindfulness and work engagement rather than to provide a comprehensive predictive model. Nevertheless, the reported R^2 values show that mindfulness alone accounts for only a limited proportion of the variation in engagement.

The addition of demographic and occupational control variables increased the proportion of explained variance in the overall UWES score from 16.9% to 30.8%, while adjusted R^2 increased from 16.0% to 23.8%. The difference between the increases in R^2 and adjusted R^2 reflects the larger number of parameters required to represent the categorical control variables. Although the controls contributed additional explanatory information, approximately 69% of the variance in overall work engagement remained unexplained.

This limitation indicates that the observed association should be examined within broader models incorporating more proximal occupational and organizational factors. Job autonomy, perceived organizational support, work-family conflict, technostress, and leadership support may have substantial direct associations with work engagement. Other potentially relevant factors include workload, role clarity, job demands, job resources, employment conditions, personality characteristics, and organizational context.

These variables may not only explain additional variance in work engagement but may also act as confounders, mediators, or moderators of its association with mindfulness. For example, the relationship between mindfulness and engagement may depend on the level of job autonomy, organizational support, or work-related stress. Future research should therefore examine the quadratic association within broader multivariate models and test whether its shape and turning point remain stable after the inclusion of these factors.

The demographic and occupational variables included in the present robustness analysis should not be regarded as a complete solution to omitted-variable bias. Their purpose was to assess whether the estimated quadratic association was attributable to basic differences in the composition of the sample. The stability of the quadratic coefficient and turning point after adjustment supports the robustness of the observed pattern, but it does not establish a causal relationship. Longitudinal or experimental designs would be required to evaluate temporal ordering and causality.

The use of purposive sampling limits the representativeness of the sample and means that the findings should be generalized with caution beyond full-time hybrid employees working in Poland. In addition, mindfulness and work engagement were measured using self-report instruments administered within the same survey, which may have introduced common-method variance, response-style effects, or social-desirability bias. Finally, because the quadratic specification was selected after inspection of the observed data and residual patterns, the estimated U-shaped relationship should be regarded as exploratory and requires replication in an independent sample.

V. Discussion

This empirical study examined the relationship between mindfulness and the individual dimensions of work engagement among employees working in a hybrid model. In line with the formulated research questions, the study investigated both the overall relationship between mindfulness and work engagement and the relationships between mindfulness and the specific dimensions of engagement, namely vigour, dedication, and absorption. The initial modelling revealed no significant linear relationship between mindfulness and work engagement. These findings contrast with the cross-sectional and longitudinal analyses conducted by Bartlett et al. (2021) and Gunasekara and Zheng (2019). However, these earlier studies did not account for the specific dynamics of remote or hybrid work settings. Furthermore, the study by Bartlett et al. (2021) was conducted following a six-week mindfulness massive open online course for employees. The results of the present study suggest that the relationship between mindfulness and work engagement is non-linear in nature. More specifically, the findings support the hypotheses assuming a U-shaped relationship between mindfulness and overall work engagement, as well as

between mindfulness and its individual dimensions. Work engagement initially decreases as mindfulness increases, but after reaching a turning point, the relationship becomes positive and progressively stronger. Specifically, as mindfulness increases, its effect on employees' work engagement intensifies at an accelerating pace. Additionally, the findings indicate that at lower levels of mindfulness, an increase in mindfulness is associated with a decrease in work engagement. However, this negative effect diminishes as mindfulness levels continue to rise, ultimately leading to a positive and accelerating impact on work engagement. At the same time, the present findings extend prior literature by suggesting that the mindfulness – work engagement relationship in hybrid work settings may not follow a simple linear "more-is-better" pattern. Instead, the results support more balanced conceptual perspectives proposed by Britton (2019) and Choi et al. (2022), according to which mindfulness-related processes may involve boundary conditions and non-linear dynamics. The findings also provide empirical support for considering mindfulness as a personal resource whose relationship with work engagement may vary depending on its level and the demands of the hybrid work environment.

One possible explanation for our results could be the specific characteristics of working from home. Research has highlighted that employees who work from home, compared to days spent in a traditional office setting, often experience greater isolation, which can result in lower work engagement (Toscano et al., 2024). Additionally, work-family conflict has been identified as a critical factor affecting work engagement (Harunavamwe and Kanengoni, 2023). Employees working in a hybrid model who experience such conflicts may struggle with work engagement, even when they exhibit relatively high levels of mindfulness. Furthermore, employees may initially find the process of practicing mindfulness challenging, which could lead to a temporary decrease in their engagement levels (Lymeus et al., 2017). In hybrid work environments, these demands may compete for employees' limited attentional and cognitive resources. From the perspective of Cognitive Load Theory (van Merrienboer and Sweller, 2010), at lower levels of mindfulness, increased awareness of distractions and competing demands may not yet be accompanied by sufficient attentional control, temporarily reducing the resources available for vigour, dedication, and absorption. Self-Regulation Theory (Inzlicht et al., 2021) further suggests that higher levels of mindfulness may enable employees to monitor attentional lapses more effectively and redirect their attention towards work-related goals. From the perspective of the JD-R Theory (Bakker et al., 2023), mindfulness may therefore be understood as a personal resource whose positive effects become visible only after reaching a sufficiently high level that enables employees to effectively cope with the cognitive and emotional demands associated with hybrid work.

VI. Conclusion and Practical Implications

The findings suggest a U-shaped relationship between mindfulness and work engagement. At lower levels, increases in mindfulness are associated with reduced engagement; however, beyond a turning point, the relationship becomes positive and increasingly stronger, enhancing employees' focus, concentration, and involvement in work. At higher levels of mindfulness, these findings are consistent with previous studies showing its positive

association with work engagement (e.g. Petchsawang and McLean, 2017). Overall, the study demonstrates that mindfulness may function as an important personal resource supporting work engagement, particularly when it reaches a sufficiently high level.

The findings have relevant socio-economic implications by highlighting the role of mindfulness in shaping work engagement in hybrid work environments. First, given the blurring boundaries between non-work and work life in hybrid work settings, mindfulness may serve as a factor supporting employees in benefiting from working from home. In particular, this may be associated with a clearer separation between non-work life and work life through the practice of mindfulness while working from home. This may lead to broader socio-economic implications, including healthier work environments, improved well-being, and even higher work productivity.

Mindfulness practice is particularly critical during digitally mediated work environments, where challenges such as social isolation and work-family conflict can make it difficult for employees to focus on their tasks and maintain engagement. The results suggest that organisations may consider implementing sustained and structured mindfulness programmes rather than relying on isolated or short-term interventions. Given the observed U-shaped relationship, employees with lower levels of mindfulness may require additional support in translating greater awareness into effective attentional self-regulation. Such initiatives should complement broader HRM practices, as organisational conditions and employees' affective states may also shape workplace behaviour (Kozjek and Brezovar, 2022). From a socio-economic perspective, the findings may support the development of more sustainable hybrid work policies, potentially reducing organisational costs associated with job burnout and lower productivity, while improving workforce well-being and labour market resilience in increasingly digitally mediated workplaces. Such support should remain balanced, recognising that work-life integration may benefit some employees, while others may function better with clearer boundaries. Therefore, organisations should seek a balanced approach in supporting mindfulness that allows employees to adapt work-life boundary management to their individual needs and home-working conditions.

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Appendix 1: Robustness model of overall work engagement with demographic and occupational controls

	Estimate	SE	t-value	p-value	95% Conf. Interval	
					Lower	Upper
UWES ~						
Intercept	2.855	0.232	12.308	< 0.001	2.397	3.313
Occupational position: operational employee (ref.: specialist/independent professional)	0.136	0.274	0.497	0.620	−0.404	0.676
Occupational position: lower-level manager (ref.: specialist/independent professional)	0.730	0.235	3.108	0.002	0.266	1.194
Occupational position: middle-level manager (ref.: specialist/independent professional)	0.556	0.225	2.469	0.015	0.111	1.000
Occupational position: senior manager (ref.: specialist/independent professional)	0.524	0.248	2.111	0.036	0.034	1.013
Place of residence: rural area (ref.: large city)	−0.218	0.209	−1.042	0.299	−0.630	0.195
Place of residence: small town (ref.: large city)	0.018	0.263	0.07	0.944	−0.500	0.537
Place of residence: medium-sized city (ref.: large city)	−0.116	0.195	−0.595	0.553	−0.501	0.269
Age: 18–24 (ref.: 25–34)	0.325	0.336	0.966	0.335	−0.339	0.989
Age: 35–44 (ref.: 25–34)	0.110	0.189	0.582	0.561	−0.264	0.484
Age: 45–54 (ref.: 25–34)	0.393	0.225	1.745	0.083	−0.052	0.837
Age: 55 or older (ref.: 25–34)	0.466	0.237	1.966	0.051	−0.002	0.934
Gender: female (ref.: male)	0.058	0.157	0.369	0.713	−0.253	0.369
Education: secondary or lower (ref.: master's degree)	0.296	0.177	1.671	0.097	−0.054	0.646
Education: bachelor's/engineering degree (ref.: master's degree)	−0.261	0.235	−1.111	0.268	−0.725	0.203
Education: doctorate (ref.: master's degree)	0.424	0.226	1.877	0.062	−0.022	0.869
Mean-centered MAAS	0.059	0.098	0.599	0.550	−0.135	0.252
Mean-centered MAAS^2	0.291	0.052	5.594	< 0.001	0.188	0.394

R^2	Adj. R^2	F-stat	p-value	DW	JB	p-value
0.308	0.238	6.76	(< 0.001)	2.144	27.083	(< 0.001)

Source: Own study

Notes: N = 186. Heteroskedasticity-consistent HC2 standard errors are reported. Reference categories were specialist/independent professional, large city, age 25–34, male, and master's degree. The categories "primary education" and "secondary education" were combined because only one respondent reported primary education. MAAS was mean-centered before calculating its squared term; R^2 coefficient of determination