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RESEARCH ARTICLE

MINDFULNESS IN INFORMATION TECHNOLOGY USE: DEFINITIONS, DISTINCTIONS, AND A NEW MEASURE

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Appendix A

Pilot Study and Study 1 Details

A pilot study was used to help conceptualize an IT mindfulness scale. To do so we recruited 80 MBA students and completed a match and sort exercise. An IT mindfulness scale was developed using this data. Next, Study 1 assessed the measurement properties of our proposed IT mindfulness scale. To do so, we collected two datasets. Our first dataset comprised survey responses from 238 students enrolled in introductory information management courses at two large southeastern universities in the United States, while the second dataset included data from 316 students enrolled in a similar course at a third large southeastern university. We used Internet applications (e.g., Instant Messenger and the World Wide Web) as the target technology for both data collections. This suite of technologies serves as an appropriate platform for examining IT mindfulness as the subjects (1) have opportunities for using these tools; (2) can use these technologies across diverse situations; and (3) possess sufficient experience to have developed a deep understanding of each application's features and functionality. Some 40.2% of respondents were female and 58%, in their third year of study, while the other 42% were in their fourth year (or higher) at their respective institution. Participants received extra credit in exchange for completing a survey during regular class meetings. The following outlines the steps undertaken in the pilot study and Study 1.

Step 1: Content and Face Validity with a Pilot Study (80 Subjects)

We developed our scale for IT mindfulness by adapting Langer's (2004) mindfulness scale to the specific context of IT use. One potential issue with our approach of adapting Langer's items is that the words used in her scale do not always reflect the names of the construct very clearly; some readers may therefore be unsure of the face validity of the scale. To allay these concerns, we offered 80 full-time and part-time MBA students at a public uiversity in the southeastern United States the opportunity to complete a survey, in which they matched the IT mindfulness items with items from Langer's (1997) original scale. Participants received a single extra credit point on an exam for completing the survey.

The matching exercise included an instrument with two columns. The first column provided a numbered list of Langer's (1997) mindfulness items. The second column included a numbered list of our IT mindfulness items. We asked participants to examine each of Langer's items and match each item with the corresponding IT mindfulness item they thought most closely related. The results allowed us to calculate the degree to which respondents perceived Langer's mindfulness and our IT mindfulness items conceptually similar.

We received complete responses from 79 of the 80 students enrolled (98.8%), with the majority of the respondents (55.6%) full-time professionals pursuing their degree part-time. Respondents averaged 32 years in age with the majority male (64.6%). To estimate the face validity of our construct, we calculated the percentage of correct matches (1) overall between the scales and (2) for each pair of items in the scale. We found that,overall, respondents accurately matched the IT mindfulness item with the mindfulness item 87.21% of the time. In addition, no pair of items has a match rate less than 80%. The results provide strong evidence that respondents viewed the IT mindfulness items and Langer's items as conceptually similar.

Step 2: Principal Components Analysis (238 Subjects)

We conducted a principal components analysis (PCA), using the data collected from 238 subjects, to assess dimensionality of our initial 12-item measure. Based on results of the PCA, we dropped one item (MP3) that cross-loaded with both the orientation in the present (0.573) and awareness of multiple perspectives (0.343) dimensions. A subsequent PCA suggested that the remaining 11 items mapped to the appropriate IT mindfulness dimensions (see Table A1).

Table A1. Factor Analysis of IT Mindfulness Items

Item	Mean	S.D.	Alertness to Distinction	Awareness of Multiple Perspectives	Openness to Novelty	Orientation in the Present
ITMD-AD1	5.65	1.18	**0.775**	0.199	0.278	0.232
ITMD-AD2	5.40	1.10	**0.894**	0.135	0.111	0.111
ITMD-AD3	4.42	1.47	**0.808**	0.250	0.201	0.136
ITMD-MP1	4.10	1.52	0.206	**0.896**	0.149	0.151
ITMD-MP2	4.17	1.52	0.253	**0.894**	0.127	0.087
ITMD-ON1	4.36	1.44	0.261	0.133	**0.803**	0.326
ITMD-ON2	4.40	1.46	0.344	0.184	**0.719**	0.363
ITMD-ON3	4.39	1.37	0.093	0.086	**0.772**	0.302
ITMD-OP1	5.65	1.49	0.133	0.021	0.021	**0.879**
ITMD-OP2	5.40	1.44	0.090	0.075	0.048	**0.863**
ITMD-OP3	3.95	1.14	0.156	0.088	0.078	**0.818**
Eigenvalue			2.432	1.857	2.036	3.074
Percent of Variance			20.27	15.48	16.97	25.61

Notes: Principal Components with Varimax rotation
Analysis conducted using SPSS 16.0
ITMD = IT Mindfulness, AD = Alertness to Distinction, MP = Awareness of Multiple Perspectives, ON = Openness to Novelty, and OP = Orientation in the Present

Step 3: Confirmatory Factor Analysis (316 Subjects)

Using our second dataset of 316 subjects, we performed a series of confirmatory factor analyses (CFAs) using EQS 6.1 to assess the dimensionality and convergent validity of our IT mindfulness measure.

We estimated three models using our original 12 items. Model 1 (unidimensional) hypothesized a unidimensional first-order factor, accounting for variance among all items. Model 2 (first-order, multidimensional) hypothesized that the 12-items form four freely correlated first-order factors, namely, (1) alertness to distinction, (2) awareness of multiple perspectives, (3) openness to novelty, and (4) orientation in the present. Model 3 (second-order) evaluated whether a second-order factor accounts for the relationships among the first-order factors. Before conducting model comparisons, we inspected item level loadings. Consistent with our first step, the CFAs consistently found that one item (MP3) loaded at less than 0.404. Therefore, we dropped this item and reestimated CFAs for all three models. The resulting loadings are satisfactory (see Table A2).

Table A2. Item Loadings, Means and Standard Deviations

Item	Standardized Item Loading	Mean	S.D.
ITMD-AD1	0.86	4.14	1.51
ITMD-AD2	0.91	4.16	1.47
ITMD-AD3	0.71	4.66	1.51
ITMD-MP1	0.87	5.35	1.28
ITMD-MP2	0.91	5.47	1.18
ITMD-ON1	0.82	4.16	1.42
ITMD-ON2	0.88	4.16	1.35
ITMD-ON3	0.94	4.22	1.40
ITMD-OP1	0.76	4.34	1.34
ITMD-OP2	0.79	4.48	1.23
ITMD-OP3	0.81	4.51	1.23

Notes: Analysis was conducted in EQS 6.1
ITMD = IT Mindfulness, AD = Alertness to Distinction, MP = Awareness of Multiple Perspectives, ON = Openness to Novelty, and OP = Orientation in the Present
All standardized item loadings are significant at $p < .01$

Step 4: A Higher-Order Conceptualization of IT Mindfulness (316 Subjects)

Using the results of the respecified model, we compared Model 1 (uni-dimensional) with Model 2 (multidimensional) to assess the dimensionality of IT mindfulness from the dataset with 316 subjects. Considering Model 1 ($\chi^2 = 722.66$, d.f. $= 44$, CFI = 0.70, RMSEA = 0.221) and Model 2 ($\chi^2 = 99.70$, d.f. $= 38$, CFI = 0.97, RMSEA = 0.072) nested fit statistics suggest that Model 2 demonstrated a better fit with the data ($\Delta\chi^2 = 622.96$, Δ d.f. $= 6$, $p < 0.0001$). This comparison finds Model 2, a multidimensional model comprised of four correlated first-order factors, superior to Model 1, a unidimensional first-order factor model. Moreover, in Model 2, we find the standardized factor loadings of items on their respective factors all significant ($p < .001$), providing additional support for *discriminant* and *convergent validity* of each dimensions' measures (Gefen et al. 2011). In sum, our analyses confirm the *multidimensional* structure of IT mindfulness.

Next, we compared Model 2 (first-order, multidimensional) and Model 3 (second-order) in an effort to assess the higher-order structure of IT mindfulness. A comparison of Model 2 ($\chi^2 = 99.70$, d.f. $= 38$, CFI = 0.97, RMSEA = 0.072) and Model 3 ($\chi^2 = 105.22$, d.f. $= 40$, CFI = 0.97, RMSEA = 0.072) reveals almost identical fit statistics. Model 3 not only provided acceptable model fit measures (Boomsma 2000; Gefen et al. 2000), but also proved more parsimonious with fewer parameters estimated and greater degrees of freedom (Grover et al. 2002). Moreover, our analysis finds all Model 3 item loadings significant at the $p < 0.001$ level (see Table A3 for item loadings, means, and standard deviations), further supporting the second-order factor model. Therefore, consistent with the mindfulness literature (Sternberg 2000), our analysis suggests that Model 3, a *higher-order multidimensional* operationalization of the IT mindfulness construct, accurately reflects our superordinate second-order conceptualization.

We then used chi-square difference tests to assess the discriminant validity of the four dimensions. For each pair of constructs, we compared the previously identified model's fit with the fit of a model where the two constructs were not set to be distinct. Constraining correlations between pairs of constructs to 1.0 suggests that items measure the same construct, while a significant difference between the χ^2 measures indicates discriminant validity (Venkatraman 1989). We found all chi-square differences significant at the $p < 0.01$ level (see Table A3). In addition, the estimated correlations between all pairs of constructs fell below the 0.90 threshold (Bagozzi et al. 1991), suggesting *discriminant validity* among the four IT mindfulness dimensions (see Table A4).

Table A3. Chi-Square Difference Tests to Assess Discriminant Validity

Dimensions	Constrained Model χ^2 (df)	Unconstrained Model χ^2 (df)	$\Delta\chi^2$
Alertness to distinction **with**			6.64
Awareness of multiple perspectives	26.76 (5)	19.59 (4)	7.17
Openness to novelty	26.08 (9)	19.34 (8)	6.74
Orientation in the present	28.61 (9)	21.14 (8)	7.47
Awareness of multiple perspectives **with**			
Openness to novelty	30.92 (5)	12.57 (4)	18.35
Orientation in the present	23.95 (5)	12.75 (4)	11.20
Orientation in the present **with**			
Openness to novelty	35.85 (9)	23.46 (8)	12.39

Note: Analysis conducted using EQS 6.1

As a final step, we evaluate reliability and average variance extracted (AVE) values (see Table A4). Our measures exceeded the 0.70 thresholds for Cronbach's alpha and composite reliability (Nunnally and Bernstein 1994). Although correlated, each dimension's AVE exceeds off-diagonal elements, suggesting dimensions constitute conceptually related, yet *discriminant*, parts of a superordinate second-order construct (Polites and Karahanna 2012).

Table A4. Construct Means, Standard Deviations, Reliabilities, and Correlation of Constructs

Construct	Mean	S.D.	Composite Reliability	Cronbach's Alpha	1	2	3	4
1. ITMD-AD	4.32	1.32	0.94	0.86	**0.85**			
2. ITMD-MP	5.42	1.17	0.93	0.88	0.48	**0.90**		
3. ITMD-ON	4.18	1.27	0.94	0.91	0.68	0.40	**0.87**	
4. ITMD-OP	4.44	1.09	0.90	0.83	0.63	0.42	0.67	**0.72**

Notes: Analysis conducted using EQS 6.1
Square-roots of the AVEs appear in bold along the diagonal of the correlation of constructs.
ITMD = IT Mindfulness, AD = Alertness to Distinction, MP = Awareness of Multiple Perspectives, ON = Openness to Novelty, and OP = Orientation in the Present

Step 5: Discriminant and Predictive Validity (316 Subjects)

To evaluate predictive and convergent validity of IT mindfulness, we compared our scale using the dataset with 316 subjects again, with cognitive absorption (CA). Although IT mindfulness and CA share a connection to the moment, they differ in terms of their task focus. Task focus refers to the target of a user's attention when completing a task (e.g., a narrow focus on completing a specific task versus a broad focus on using IT to support many aspects of one's job) (Dane 2011). IT mindfulness has a broader task focus than cognitive absorption. An IT mindful user would likely be aware of how more, or new, features of Internet applications enable task completion, all while being sensitive to how their use affects the remainder of their work. In contrast, when cognitively absorbed, users hyper-focus on performing a single task, or narrowly defined set of tasks, to accomplish a desired outcome (Csikszentmihalyi 1990). Because of cognitive absorption's focus on immersion in IT use, CA should exert more influence than IT mindfulness, a more broadly defined construct, on technology acceptance beliefs. This is because technology acceptance beliefs, as conceptualized and measured using constructs like PU and PEOU, are useful and easy to use

for a specific task. Just as Fishbein and Azjen (1975) argued that beliefs will correlated more highly with behaviors if they are at the same level of abstraction, we believe that, compared to IT mindfulness, CA will correlate more strongly with technology acceptance beliefs. In short, IT mindfulness has a broader task focus. As a result, we predict that compared to IT mindfulness, CA will have a stronger influence on PU and PEOU.

Next, with the same dataset of 316 subjects, we evaluate a structural model that includes IT mindfulness, CA, and two technology acceptance constructs of interest (e.g., PU and PEOU). Figure A1 presents the results of the structural model. The measurement model provides evidence of the discriminant validity of IT mindfulness relative to the other three constructs (see Table A5). We also performed a *chi-square* differences test for cognitive absorption and IT mindfulness. The difference is significant ($\Delta \chi^2 = 86.58$, $p < .001$), indicating further strong support for discriminant validity. Moreover, the structural model provides evidence that CA demonstrated greater predictive power than IT mindfulness in affecting both PU and PEU. Indeed, when CA is present, IT mindfulness does not significantly relate to either technology acceptance construct.

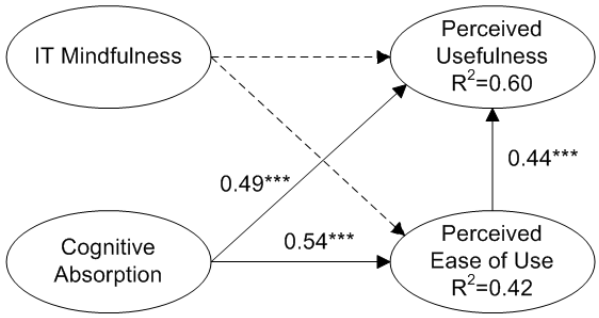

Figure A1. Predictive Validity

Table A5. CA/IT Mindfulness: AVEs, Correlations and Reliabilities

Construct	Mean	S.D.	C.R.	C.A.	1	2	3	4	5	6	7	8	9	10	11
1. ITMD-AD	4.27	1.31	0.93	0.89	**0.87**										
2. ITMD-MP	5.41	1.17	0.94	0.88	0.45	**0.94**									
3. ITMD-ON	4.16	1.22	0.94	0.91	0.65	0.39	**0.88**								
4. ITMD-OP	4.30	1.11	0.92	0.89	0.61	0.36	0.68	**0.84**							
5. CA-CO	4.85	0.96	0.82	0.67	0.29	0.39	0.33	0.36	**0.79**						
6. CA-CU	4.59	1.12	0.97	0.95	0.50	0.43	0.64	0.55	0.37	**0.95**					
7. CA-FI	4.32	1.00	0.87	0.82	0.25	0.17	0.28	0.32	0.31	0.36	**0.77**				
8. CA-HE	4.99	1.03	0.90	0.85	0.32	0.39	0.42	0.44	0.55	0.58	0.41	**0.84**			
9. CA-TD	5.39	1.15	0.96	0.95	0.20	0.27	0.19	0.27	0.39	0.31	0.31	0.59	**0.88**		
10. PEU	5.11	1.06	0.93	0.89	0.35	0.36	0.32	0.39	0.58	0.32	0.38	0.47	0.39	**0.87**	
11. PU	5.28	1.04	0.96	0.94	0.34	0.44	0.36	0.37	0.55	0.42	0.37	0.55	0.51	0.65	**0.92**

Notes: Square Root of AVEs are in bold and reported along the diagonal of the correlation of constructs.
ITMD = IT Mindfulness, AD = Alertness to Distinction, MP = Awareness of Multiple Perspectives, ON = Openness to Novelty, OP = Orientation in the Present, CA = Cognitive Absorption, CO = Control, CU = Curiosity, FI = Focused Immersion, HE = Heightened Enjoyment, TD = Temporal Dissociation, PEU = Perceived Ease of Use, and PU = Perceived Usefulness

Appendix B

Study 2 Details

Langer's (1989) research suggests that absolute instruction produces lower levels of mindfulness, whereas conditional instruction provokes greater levels of mindfulness. Absolute instruction provides a strict set of conditions and outcomes specific to task completion, whereas conditional instruction "allows the processing of information with some uncertainty, as if it could be true rather than as if it is true" (Langer 1989, p. 141). In a series of three experiments, Langer et al. (1989) showed that these conditions result in different levels of mindfulness.

Following Langer's approach, we conducted an experiment that manipulated absolute and conditional instructions as part of an assignment. We asked subjects to develop a "visual resume" using either PowerPoint or Prezi. PowerPoint is a popular computer-based presentation tool; Prezi is a popular cloud-based, open-ended, nonlinear presentation tool (www.prezi.com). In the absolute condition, we outlined specific requirements, including use of template, application of color, inclusion of pictures and content, as well as number of slides. For the conditional instruction, we provided the following much broader instructions.

> *Create a PowerPoint (or Prezi) presentation that highlights you. The presentation will be used to highlight students to alumni and potential employers. We recommend that you think of this presentation as your Visual Resume. The story, look, and feel of the presentation is up to you.*

We invited 390 students enrolled in an introductory information systems course at a large northeastern university to participate in our experiment. Participating students received extra credit. We randomly assigned students to one of the four conditions, specifically, (1) PowerPoint with absolute instructions, (2) PowerPoint with conditional instructions, (3) Prezi with absolute instructions, and (4) Prezi with conditional instructions. We first introduced the students to the focal technology (PowerPoint or Prezi) specific to the respective condition and gave a 10-minute demonstration. The same person provided the demonstration, irrespective of the condition. For subjects in the Prezi condition, the tutorial included two short 5-minute videos instructing them how to create a presentation. All subjects in the PowerPoint condition viewed a similar 10-minute tutorial. Subsequently, we administered a pre-survey at Time 1 asking subjects how they would use the assigned technology. Constructs in this survey included (1) IT mindfulness, (2) computer playfulness (Webster and Martocchio 1992), (3) user experience (Marakas et al. 2007), (4) IS creativity (Tiwana and McLean 2005), and (5) personal innovativeness in IT (PIIT) (Agarwal and Prasad 1998). After completing the pre-survey, students received their assignment with conditional or absolute instructions and were given two business days to complete it. Upon completion of the assignment at Time 2, participants received a post-experiment survey. This survey included scales for (1) IT mindfulness, (2) behavioral intention (Venkatesh and Davis 2000), and (3) satisfaction (Bhattacherjee 2001). We also conducted manipulation checks, confirming experiment validity. In total, 268 students completed both surveys as well as the assignment. Table B1 provides sample characteristics.

Table B1. Sample Characteristics

	Mean	S.D.
Age	20.34	3.44
Prezi Experience	3.31 (7-Point Likert)	1.97
PPT Experience	5.84 (7-Point Likert)	1.39
Gender	Male/Female	133/135

Note: All Students enrolled in a sophomore level business course.

We estimated a confirmatory factor analysis using Mplus 7.0. All items loaded on the appropriate factor at or above 0.70, with the exception of one PIIT item and one IT mindfulness item, with each loading at 0.69 and 0.68 respectively. The average variance extracted (AVE) of all constructs exceeded the 0.05 threshold. Overall, we found evidence of stability in our items. Table B2 reports the composite reliabilities and AVE of IT mindfulness dimensions as well as item loadings.

Table B2. Item Loadings, Means and Standard Deviations

Item	Standardized Item Loading	Mean	S.D.
AD1	0.71	5.48	0.96
AD2	0.87	5.53	1.01
AD3	0.86	5.21	1.07
MP1	0.91	6.01	0.94
MP2	0.96	6.03	0.93
ON1	0.93	5.26	1.14
ON2	0.68	5.40	1.21
ON3	0.89	5.39	1.17
OP1	0.92	5.75	1.10
OP2	0.93	5.68	0.97
OP3	0.96	5.52	1.05

Notes: Analysis was conducted in EQS 6.1
AD = Alertness to Distinction, OP = Orientation in the Present, MP = Awareness of Multiple Perspectives, ON = Openness to Novelty
All standardized item loadings are significant at $p < .01$

We evaluated the discriminant validity of IT mindfulness by comparing the construct to computer playfulness, behavioral intention, IS creativity, PIIT, and satisfaction. We employed the guidelines found in the multiple-dimensional constructs literature and compared off-diagonal elements of our correlations matrix to the square roots of the AVEs at the construct level (Roberts and Thatcher 2009; Wright et al. 2012). As reported in Table B3, IT mindfulness discriminates from the other constructs: no correlation in the appropriate row and column intersection exceeds the square root of the AVE. It is worth noting that PIIT and IS creativity correlated at 0.96, and thus are not discriminant. Given these constructs fall outside of the focus of this study, we moved forward with our analysis. Moreover, fit statistics (see Table B4) exceeded established cutoffs (Brown 2006).

Table B3. Correlation Matrix for Measurement Model

Construct	Mean	S.D.	C.R.	C.A.	1	2	3	4
(1) IT Mindfulness	5.61	1.04	0.87	0.87	**0.83**			
(2) Computer Playfulness	5.36	1.13	0.98	0.98	0.47	**0.97**		
(3) IS Creativity	4.94	1.48	0.93	0.90	0.26	0.31	**0.89**	
(4) PIIT	4.56	1.50	0.87	0.86	0.50	0.39	0.50	0.83

Notes: Square Root of AVEs are in bold and reported along the diagonal of the correlation of constructs.
PIIT = Personal Innovativeness with IT.

Table B4. Fit Statistics for the Measurement Model

Statistic	Value	Cutoffs
CFI	0.95	0.90
RMSEA	0.07	0.08

To determine whether IT mindfulness changed as a result of our experimental manipulations, we estimated several models using the latent factor scores derived from the measurement model. We first used two simple ANOVA analyses to evaluate whether differences existed between how participants viewed their interaction with the Prezi and PowerPoint software. Table B5 suggested that differences exist between Prezi and PowerPoint with respect to IS creativity and personal innovativeness in IT (PIIT), but not computer playfulness or IT mindfulness. Next, we examined whether differences existed in IT mindfulness across PowerPoint and Prezi after training (i.e., T2). Our ANOVA results found no difference ($p > .383$) between IT mindfulness associated with the different types of technology used for the task.

Table B5. Between-Technology Difference		
Construct	**F**	**Sig.**
IT Mindfulness (Time 1)	0.02	0.901
Computer Playfulness	3.08	0.081
Experience with the Prezi / PPT	242.53	0.000
IT Creativity	15.85	0.000
Personal Innovativeness in IT	12.61	0.000

Finally, we conducted an ANCOVA analysis to explore the difference in the mindfulness condition (i.e., absolute and conditional instructions) with respect to IT mindfulness, while controlling for experience with the presentation software as well as participants' age and gender. We find that an absolute task does indeed lower IT mindfulness compared to the conditional instruction ($p < 0.022$). In sum, our results indicate that IT mindfulness can be manipulated based on conditional and absolute task instructions. We report these results in Table B6.

Table B6. ANCOVA for IT Mindfulness (Time 2)		
Construct	**F**	**Sig.**
Mindfulness Condition	5.33	0.022
Age	0.37	0.848
Experience	2.31	0.129
Gender	2.86	0.092

Note: Age, experience, and gender are covariates in this analysis.

Appendix C

Study 3 Details

To further establish the predictive validity of our IT mindfulness scale, Study 3 placed IT mindfulness in the nomological net used to describe post-adoption system use. Also, we used hierarchical regression and dominance analysis to compare the predictive power of IT mindfulness and trait mindfulness. Table C1 reports Study 3 sample characteristics.

Table C1. Sample Characteristics		
	Mean	**S.D.**
Age	46.38	9.73
Excel Experience	5.89 (7-Point Likert)	1.31
PC Experience	6.86 (7-Point Likert)	0.41
Work Experience	9.9 Years	8.60
Gender	Male / Female / Non-report	99 /204 /1
Education level	High school Associates degree Bachelor's degree Post-graduate degree	50 61 112 81

Note: Work experience is the number of years at the current company.

We evaluated whether our second-order construct of IT mindfulness accounts for the relationships among its first-order factors. Consistent with Study 1, the second-order factor model results (χ^2 =76.93, d.f. = 40, CFI = .991 RMSEA = .060) recommended a higher-order construct of IT mindfulness. In addition, we found all chi-square differences between IT mindfulness dimensions significant at the $p < .01$ level, indicating discriminant validity. Finally, the correlations (see Table C2) between all pairs of first-order constructs of IT mindfulness fall below 0.90 (Bagozzi et al. 1991), indicating distinct dimensions. Table C3 provides the item measures as well as means and standard deviations.

Table C2. AVEs, Correlations and Reliabilities

Construct	Mean	SD	CR	CA	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. ITMD-AD	4.26	1.4	.92	.92	**.89**													
2. ITMD-MP	5.59	1.1	.90	.89	.63	**.90**												
3. ITMD-ON	4.83	1.3	.93	.93	.83	.49	**.91**											
4. ITMD-OP	4.50	1.3	.81	.80	.84	.82	.83	**.77**										
5. MD-AD	5.20	1.1	.89	.88	.41	.50	.38	.41	**.82**									
6. MD-MP	5.43	1.0	.79	.78	.37	.35	.39	.37	.57	**.75**								
7. MD-ON	5.84	0.9	.89	.88	.45	.44	.43	.45	.62	.67	**.79**							
8. MD-OP	5.35	0.9	.69	.69	.53	.37	.38	.53	.66	.79	.73	**.66**						
9. CON	5.66	1.2	.79	.85	.34	.63	.37	.34	.07	.05	.14	.12	**.76**					
10. DSU	4.81	1.4	.92	.91	.59	.57	.52	.59	.37	.27	.34	.40	.49	**.83**				
11. TRY	4.24	1.5	.93	.93	.60	.30	.56	.60	.35	.21	.25	.34	.45	.67	**.91**			
12. PEU	5.16	1.1	.86	.85	.49	.40	.50	.49	.14	.12	.12	.14	.41	.38	.42	**.78**		
13. PU	5.48	1.1	.93	.93	.55	.50	.59	.55	.18	.22	.22	.18	.46	.45	.35	.62	**.87**	
14. SSE	7.57	2.3	.95	.95	.39	.60	.38	.39	.25	.20	.29	.32	.50	.53	.52	.41	.50	**.88**

Notes: Square-root of the AVEs are reported in bold along the diagonal of the correlation of constructs.
ITMD = IT Mindfulness, MD = Trait Mindfulness, AD = Alertness to Distinction, MP = Awareness of Multiple Perspectives, ON = Openness to Novelty, OP = Orientation to the Present, CON = Continuance Intention, DSU = Deep Structure Usage, TRY = Trying to Innovate, PEU = Perceived Ease of Use, PU = Perceived Usefulness, and SSE = Spreadsheet Self-Efficacy
Measurement Model Fit Statistics Chi-square 1955.73 with 1,084 degrees of freedom, CFI = .93, RMSEA .051

Table C3. Item Measures

Construct & Item		Mean	S.D.
IT Mindfulness: Alertness to Distinction[a]			
AD1	I find it easy to create new and effective ways of using Excel.	4.32	1.49
AD2	I am very creative when using Excel.	4.23	1.54
AD3	I make many novel contributions to my work-related tasks through the use of Excel.	4.18	1.54
IT Mindfulness: Awareness of Multiple Perspectives[a]			
MP1	I am often open to learning new ways of using Excel.	5.53	1.20
MP2	I have an open mind about new ways of using Excel.	5.66	1.04
IT Mindfulness: Openness to Novelty[a]			
ON1	I like to investigate different ways of using Excel.	4.72	1.36
ON2	I am very curious about different ways of using Excel.	4.84	1.38
ON3	I like to figure out different ways of using Excel.	4.79	1.39
IT Mindfulness: Orientation in the Present[a]			
OP1	I often notice how other people are using Excel.	4.34	1.68
OP2	I attend to the 'big picture' of a project when using Excel.	4.42	1.41
OP3	I 'get involved' when using Excel.	4.76	1.42
Continuance Intention[b]			
CON1	I intend to continue using Excel rather than discontinue its use.	6.96	1.18
CON2	My intentions are to continue using Excel rather than use any alternative means.	6.40	1.31
CON3	If I could, I would like to discontinue my use of Excel [c]	5.06	1.64
Deep Structure Usage[b]			
DSU1	I use features that help me analyze my data.	4.18	1.59
DSU2	I use features that help me compare and contrast aspects of the data.	4.48	1.63
DSU3	I use features that help me test different assumptions in the data.	4.56	1.72
DSU4	I use features that help me derive insightful conclusions from the data.	4.40	1.67
DSU5	I use features that help me perform calculations on my data.	4.69	1.55
Trying to Innovate[b]			
TRY1	I discovered new features of Excel.	4.36	1.52
TRY2	I found new uses of Excel.	4.30	1.59
TRY3	I used Excel in novel ways.	4.24	1.65
Perceived Ease of Use[a]			
PEU1	My interaction with Excel is clear and understandable.	5.27	1.26
PEU2	Interacting with Excel does not require a lot of mental effort.	5.23	1.45
PEU3	I find it easy to get Excel to do what I want it to do.	5.16	1.36
PEU4	I find Excel to be easy to use.	5.09	1.34
Perceived Usefulness[a]			
PU1	Helps me to accomplish tasks more quickly.	5.24	1.16
PU2	Improves the quality of the work I do.	5.35	1.20
PU3	Gives me greater control over my work.	5.31	1.21
PU4	Enhances my effectiveness in my work.	5.27	1.17
Spreadsheet Self-Efficacy[a, d] **I believe I have the ability to…**			
SSE1	manipulate the way a number appears in a spreadsheet.	5.41	2.49
SSE2	use and understand the cell references in a spreadsheet.	6.56	2.38
SSE3	use a spreadsheet to communicate numeric information to others.	7.18	2.33
SSE4	write a simple formula in a spreadsheet to perform mathematical calculations.	7.56	2.50
SSE5	use a spreadsheet to display numbers as graphs.	7.67	2.59

Notes: [a]Collected in Time 1
[b]Collected in Time 2
[c]Reverse coded
[d]1 = Not at all confident, 10 = Totally confident
Unless otherwise noted, items were measured on a 1 = Strongly Disagree, 7 = Strongly Agree format.

Comparing IT and Trait Mindfulness

We used hierarchical regression to determine whether IT mindfulness offered additional explanatory power beyond trait mindfulness in explaining post-adoption system use behaviors. In the first step, we entered control variables; in the second, trait mindfulness; and in the third, IT mindfulness. As noted in Table C4, IT mindfulness explained significant variance beyond trait mindfulness in deep structure usage and trying to innovate. Moreover, we found that although trait mindfulness relates to continuance intention, IT mindfulness does not. In addition, we conducted subsequent *post hoc* analyses for interaction effects. We found, however, no evidence to support interactions between trait mindfulness and IT mindfulness as the constructs relate to our dependent variables. Together, our findings suggest that IT mindfulness and trait mindfulness are distinct from, and relate differently to, post-adoption systems use factors.

Table C4. Hierarchical Regression Analyses Comparing Trait Mindfulness and IT Mindfulness Ability to Predict Post-Adoptive Behaviors

	Try to Innovate			Deep Structure Usage			Continuance Intention		
	Step 1	**Step 2**	**Step 3**	**Step 1**	**Step 2**	**Step 3**	**Step 1**	**Step 2**	**Step 3**
Controls[a]									
PEU	0.28*	0.20***	0.01	0.01	0.04	-0.07	0.06	0.05	0.02
PU	0.14	0.08	-0.11	0.31***	0.27***	0.16*	0.30***	0.32***	0.29***
SSE	0.25**	0.36***	0.30***	0.43***	0.36***	0.32***	0.38***	0.41***	0.40***
Trait Mind.		0.17**	-0.09		0.23***	0.09		-0.09	-0.14
IT Mind.			0.62***			0.36***			0.11
F	47.28***	39.72***	47.75***	59.49***	43.33***	43.55***	53.61***	33.28***	28.21***
Adj. R^2	0.32	0.35	0.49	0.37	0.42	0.47	0.35	0.36	0.36
Δ Adj R^2		0.03**	0.14***		0.05***	0.05***		0.03**	0.00

Notes: [a]Standardized regression coefficients are reported.
* p < .05; ** p < .01; *** p < .001

To test the effect size of IT mindfulness on each of the dependent variables, we compared the R^2 statistics with and without IT mindfulness as an independent variable. The effect size (f^2) is calculated as follows (Chin 1998):

$$f^2 = (R^{2\text{included}} - R^{2\text{excluded}}) / (1 - R^{2\text{included}})$$
$$f^{2\ \text{Trying to Innovate}} = (0.49 - 0.35) / 0.51 = 0.27$$
$$f^{2\ \text{Deep Structure Usage}} = (0.47 - 0.42) / 0.53 = 0.09$$
$$f^{2\ \text{Continuance Intention}} = (0.36 - 0.36) / 0.64 = 0.00$$

Using Cohen's (1988) interpretation of effect size (i.e., f^2 between 0.02 and 0.15 for a small effect size, between 0.15 and 0.35 for medium, and greater than 0.35 for large), our results provide evidence in support of the contention that the effect for IT mindfulness on trying to innovate (i.e., a medium effect with $f^2 = 0.27$) exceeded the effects on continuance intention and deep strcture usage (i.e., a small effect of $f^2 = 0.00$ and 0.07 respectively). We also performed a mediation test and found that IT mindfulness mediates PEU and SSE to DSU and INNOV. Further, we conducted an EFA using Mplus and we found that the fit indices are best for the four-construct conceptualization. Details about these two tests can be requested from the authors.

Finally, we conducted a dominance analysis with continuance intention, deep structure usage, and trying to innovate as the dependent variables. Dominance analysis provides a method to examine the extent to which each predictor (e.g., IT mindfulness or trait mindfulness) contributes to the overall R^2 (Krasikova et al. 2011; LeBreton and Tonidandel 2008). This measurement is relative to the other predictors in the model. General dominance provides a comparative score of which predictor accounts for the proportion of the R^2 value. For example, for the dependent variable, trying to innovate, IT mindfulness accounts for $R^2 = 0.356$ (general dominance) of the total $R^2 = 0.413$ accounted for in a model with both IT mindfulness and trait mindfulness. This is 86.2% of the variance accounted for (e.g., rescaled dominance). Table C5 details our complete dominance analyses. As shown, these results provide strong evidence that IT mindfulness accounts for significantly more of the variance in dependent variables than trait mindfulness.

Table C5. Dominance Analyses Comparing Trait Mindfulness and IT Mindfulness Ability to Predict Post-Adoptive Behaviors			
	Trying to Innovate		
	General Dominance	**Rescaled Dominance**	**R-Squared**
IT Mindfulness	0.356	86.2	0.413
Trait Mindfulness	0.057	13.8	
	Deep Structure Usage		
	General Dominance	**Rescaled Dominance**	**R-Squared**
IT Mindfulness	0.28	75.27	0.374
Trait Mindfulness	0.09	24.73	
	Continuance Behavior		
	General Dominance	**Rescaled Dominance**	**R-Squared**
IT Mindfulness	0.16	91.01	0.178
Trait Mindfulness	0.02	8.99	

Note: Rescaled dominance was computed by dividing the general dominance estimates by the R^2.

Appendix D

A Short-Form Instrument

We developed a short-form scale of IT mindfulness, which conforms to contemporary practices in psychology (Smith et al. 2012). To evaluate the short-form scale, we looked at measurement properties within the IT mindfulness construct and also examined the relationships within the structural model.

Using the data gathered in Study 3, we selected the four highest loading items for each of the four first-order constructs (AD2, MP1, ON3, and OP3). We then executed a simple confirmatory factor analysis (CFA) with these four items to test the convergent and discriminant properties of the new short-form construct. We found the resulting Cronbach's alpha equal to 0.876 and at an acceptable level within 0.006 of the long form measure. We also found acceptable loadings for the short-form construct scale (see Table D1).

Table D1. Item Loadings, Means and Standard Deviations		
Item[a]	**Loading[b]**	**Mean**
AD2	0.91	4.23
MP1	0.87	5.54
ON3	0.94	4.84
OP3	0.81	4.73

Notes: [a]AD = Alertness to Distinction, OP = Orientation in the Present, MP = Awareness of Multiple Perspectives, ON = Openness to Novelty
[b]All standardized loadings have $p < 0.01$

Next, we compared the structural models and found no significant changes in path weights (see Figure 4 in the main paper). Further, the short-form instrument also has acceptable discriminant and convergent validities (see Table D2). Finally, we found the short-form instrument's fit statistics somewhat lower than that of the full model, but still in the acceptable range (see Table D3). In sum, the short-form scale of IT mindfulness provides a means for researchers to parsimoniously include IT mindfulness in their work. With that said, caution must be taken when using short-form measures given potential tradeoffs between validity and reliability (Polites et al. 2012; Smith et al. 2012).

Table D2. Correlation Matrix for Measurement Model

Construct	AVE	C.R.	1	2	3	4
(1) IT Mindfulness (4-items)	0.59	0.85	**0.77**			
(2) Continuance Intention	0.58	0.80	0.40	**0.76**		
(3) Deep Structure Usage	0.68	0.91	0.61	0.67	**0.83**	
(4) Trying to Innovate	0.89	0.96	0.65	0.49	0.67	**0.94**

Notes: AVE = Average Variance Extracted, Square Root of AVEs are in bold and reported along the diagonal of the correlation of constructs. C.R. = Composite Reliabilities.

Table D3. Fit Statistics for the Measurement Model

Statistic	Value	Cutoffs
CFI	0.94	0.90
RMSEA	0.087	0.08

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