Mindful Mobile Phone Use:

A Quasi-Experimental Study on the Effect of Mindful-based Stress Reduction (MBSR) on

Online Vigilance, Media Multitasking, and Habitual Mobile Phone Use

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Abstract submitted to the

The virtual 71st Annual International Communication Association Conference

27-31 May 2021

The mobile phone allows us to be permanently connected to our social network and enables access to online content and communication at any time (Klimmt, Hefner, Reinecke, Rieger, & Vorderer, 2018). Mobile devices like the smartphone and mobile internet have thus considerably changed our everyday communication behavior and routines. Individuals cultivate this permanent connectedness by, for example, reading and answering messages immediately - frequently in parallel with other activities (David, 2018). Often, activities such as checking for new (social) information or reacting to them is habitualized and thus automatic (Schnauber-Stockmann & Naab, 2019). In addition to these new usage behaviors, some observe a more or less constant mental preoccupation with online content and communication that can be described as online vigilance (Reinecke et al., 2018).

As a consequence of this permanent connectedness on both the behavioral and cognitive-emotional level, stress and mental health problems might emerge (e.g., Hefner & Vorderer, 2017; Reinecke et al., 2016). Moreover, some users experience that they at least partly have lost control over when and how often they use their mobile phone and think of it, or respectively the contents it provides such as streams of communication among their peers. They thus wish to change their mobile phone usage and their attachment to the phone to self-determinedly control both more actively (Russo, Ollier-Malaterre, & Morandin, 2019). However, as smartphone-related behavior and thoughts are habitualized to a great extent (Bayer, Dal Cin, Campbell, & Panek, 2016) this is a difficult endeavor. It is thus relevant to identify techniques that can support the desired change and may prevent the smartphone to make users stressed or even ill.

One promising strategy to enhance self-determined, and thus possibly less problematic, smartphone use seems to be the cultivation of mindfulness. Mindfulness can be defined as awareness of present experience with acceptance (Germer, 2004) and has been shown to strengthen self-regulation (Vago & Silbersweig, 2012), a central ability to "de-automate" behavior, thoughts, and emotions. Brown and colleagues describe it as rooted "in the fundamental activities of consciousness: attention and awareness" (Brown, Ryan, & Creswell, 2007). In a "normal", mindless mode, if something comes into the awareness and catches the attention of individuals, they would very quickly appraise and categorize these (internal and external) stimuli based on past experiences. The quick categorization is

followed by a fast reaction to it on a cognitive, emotional, somatic, and/or conative level (Brown et al., 2007). Applied to the mobile phone, this would mean that an external stimulus (e.g., a signal tone) or an internal stimulus (e.g., the thought if somebody has already reacted to one's latest post on Instagram) would instantly be categorized as an (often highly welcomed) call for action that leads to the behavior of taking the phone and checking it (Bayer, Campbell, & Ling, 2016). As a further example, also external stimuli not originating from the phone but from, e.g. a particular situation or location such as waking up in the morning or getting on the subway can automatically trigger mobile phone use.

By contrast, a mindful mode is a „receptive state of mind, wherein attention is kept to a bare registering of the facts observed" (Brown et al., 2007). Thus, while being mindful, stimuli are just observed without automatically categorizing them. This observation without categorization, and being present in the current moment can also prevent fast, automatic reactions. Thus, in a mindful mode, individuals would just observe that their phone sends a signal tone and, perhaps, also observe their according desire to check the phone. This awareness regarding the stimulus and the resulting desire to check or use the phone opens a window of opportunity for conscious decision-making: Perhaps, the individual decides to indeed use the phone and therefore satisfies the need – which would then be a mindful decision. Or, the individual decides to not use the phone, e.g., because higher-order goals are prioritized (Friese & Hofmann, 2016). Mindful awareness thus allows for conscious decision-making and helps to de-automatize cognitions, emotions, and behaviors (Kang, Gruber, & Gray, 2013).

Another effect of mindfulness that Brown and colleagues describe as "desensitization" seems to be helpful for the de-automatization of mobile phone-related cognitions, emotions, and behaviors: The pure observation of internal and external experiences 'as they are' should lead to a greater tolerance for unpleasant states and thus – in turn – to a greater willingness of exposure to them (Brown et al., 2007). A mobile phone-related example of the importance to allow for negative emotional states seems—among others—to be the emotional state of boredom. Being mindful, boredom could be regarded more 'as it is' with openness and acceptance towards the experience and without instantly reacting to it by doing the obvious: using the mobile phone (Walsh, White, & Young, 2009).

To sum up: Mindfulness seems to have the potential to make individuals more flexible regarding their reactions to internal and external events by opening up a window of opportunity that allows for conscious decision-making. Individuals in a mindful state should thus use their mobile phone in a less automatic and habitual way, thus engage less in media multitasking and be less online vigilant.

Empirical results support the presumed connections between mindfulness and more conscious use of the smartphone (Bauer, Loy, Masur, & Schneider, 2017; Feldman, Greeson, Renna, & Robbins-Monteith, 2011; Panek, Bayer, Dal Cin, & Campbell, 2015) and multitasking (Levy, Wobbrock, Kaszniak, & Ostergren, 2012). Most interestingly, Throuvala and colleagues found that the use of an app targeting the cultivation of mindfulness decreased the extent to which individuals are disturbed by their smartphone (Throuvala et al., 2020).

Based on the theoretical considerations outlined above and existing empirical results, the question now arises of how smartphone users can cultivate mindfulness. A widely used, standardized mindfulness training program is the mindfulness-based stress reduction program (MBSR) developed by Jon Kabat-Zinn. Over the course of eight weeks, participants are guided to attain a higher level of mindfulness through meditation, yoga, and body observation. Numerous studies accompanying this program have confirmed its positive effects on mindfulness, health, and self-regulation (Grossman, Niemann, Schmidt, & Walach, 2004). Its effects on automatic mobile phone use and online vigilance, as the cognitive orientation towards online content and communication, have, however, not been examined yet.

We therefore investigate the influence of this eight-week mindfulness training on the use of mobile phones and postulate the following three hypotheses: Participating in an MBSR-training leads to a lower degree of smartphone multitasking (H1), online vigilance (H2), and habitual smartphone use (H3).

Method

To test the three hypotheses, a quasi-experimental 2x1-between-subject survey was conducted in a repeated-measures design. $N = 35$ participants took part in an eight-week MBSR course (77% women, age = 44.6 years) while $n = 26$ were part of the control group and did not participate in a MBSR course (73% women, age = 34.8 years; comparison to experimental group $F(1, 60) = 8$, $\eta^2 = 0.12$). All study participants filled out a standardized online survey pre and post the course (experimental group) resp. pre and post an eight-week period of time (control group). During the course, participants met weekly and were encouraged to perform various exercises such as meditation, body scan, and yoga on a daily basis. Neither the experimental group nor the control group received an incentive for participating in the survey. The study was pre-registered through the OSF.[1]

Mindfulness was measured with 15 items based on the German short version of the Five Facet Mindfulness Questionnaire (FFMQ-D, Michalak et al., 2016, α = .80). Online vigilance was measured using the Online Vigilance Scale by Reinecke and colleagues (2018) which consists in total of 12 items across three dimensions (α = .92). To measure smartphone multitasking, respondents were asked whether they had used their smartphone in the last two weeks while in traffic, using other media, doing something with friends or family, having a meal, or having a conversation at the same time (following Reinecke et al., 2016, α = .71). Lastly, habitual smartphone use was measured with four items (Gardner, Abraham, Lally, & Bruijn, 2012, α = .89). All questions used five-point Likert scales and showed satisfying consistency. Three ANCOVAs were run to determine the interaction effects between time (t0 vs. t1) and group (experimental group vs. control group). Due to significant differences between the groups regarding age (see above) and their intention to use their smartphones more consciously in the future, both were used as covariates.

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[1] Anonymous link: https://osf.io/9htwm/?view_only=c086402b464540e9ab98489293e23b3d

Results and Discussion

As can be seen in Table 1, the participation in an MBSR course increases the mindfulness of the participants and, in accordance with the hypotheses, decreases smartphone multitasking behavior (H1), online vigilance (H2), and habitual smartphone use (H3). All interaction effects of condition and time of measurement are highly significant and show high effect sizes.

Table 1

Interaction effects between experimental condition and time regarding mindfulness and smartphone use

	Experimental Group (MBSR participants)		Control Group (no course)		Interaction effect	
	Mt0 (SD)	**Mt1 (SD)**	**Mt0 (SD)**	**Mt1 (SD)**	**F(2, 59)**	**Cohen's d**
Mindfulness	3.17 (0.46)	3.57 (0.42)	3.37 (0.51)	3.37 (0.48)	12.57**	0.94
Online vigilance	2.8 (0.97)	2.2 (0.82)	3.08 (1.21)	3.14 (1.11)	11.95**	0.91
Multitasking[a]	2.33 (0.8)	1.97 (0.54)	2.68 (0.7)	2.67 (0.65)	10.29**	0.84
Habitual Use	2.66 (1.08)	2.1 (0.78)	3.05 (1.07)	3.15 (0.99)	13.06**	0.97

Note. All dimensions measured on a scale from 1 to 5;

[a] interaction effect age x time: $F(2, 59) = 4.78$, Cohen's d = 0.58

The results thus show that strengthening mindfulness through an MBSR course leads to a more conscious and less automated use of the smartphone, less mobile phone multitasking as well as to a lower cognitive orientation towards online content and communication.

Discussion and Outlook

Results demonstrate a high effectiveness of MBSR courses regarding mobile phone use. This is noteworthy because mobile phone use is not even addressed within the courses. Results thus show that cultivating mindfulness in general unfolds not only effects on this broad level, but also particularly regarding mobile-phone related mental orientations and.behaviors. This demonstrates once more that cultivating mindfulness might be a chance as it seems to transfer its salutogenic effects to various psychological and physiological domains (e.g., Eberth & Sedlmeier, 2012). So, for example, teaching mindfulness in schools might have broad positive effects that manifest in different behavioral and mental domains including problematic smartphone use. Perhaps, specific training in mindful mobile media use could be a more attractive connecting point regarding mindfulness for adolescents than mindfulness in general. It could thus be worthwhile to describe, define and also teach explicit "mindful mobile media use" that could manifest itself in conscious, self-determined mobile media use which is beneficial for individuals and consequently—in the long run—for society as a whole.

Also, future research should examine different forms of mindfulness training—e.g., via apps, within the school curriculum, etc.—for the cultivation of mindfulness and its positive effects on mobile phone use. Moreover, research is needed that goes into the processes in detail and investigates, for instance, whether the acceptance of negative emotions, such as boredom, indeed leads to less automatic and more conscious use of the mobile phone.

References

Bauer, A. A., Loy, L. S., Masur, P. K., & Schneider, F. M. (2017). Mindful Instant Messaging.
Journal of Media Psychology, *29*(3), 159–165. https://doi.org/10.1027/1864-1105/a000225

Bayer, J. B., Campbell, S. W., & Ling, R. (2016). Connection Cues: Activating the Norms and Habits
of Social Connectedness. *Communication Theory*, *26*(2), 128–149.
https://doi.org/10.1111/comt.12090

Bayer, J. B., Dal Cin, S., Campbell, S. W., & Panek, E. (2016). Consciousness and Self-Regulation in
Mobile Communication. *Human Communication Research*, *42*, 71–97.

Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical Foundations and
Evidence for its Salutary Effects. *Psychological Inquiry*, *18*(4), 211–237.
https://doi.org/10.1080/10478400701598298

David, P. (2018). Threaded Cognition Approach to Multitasking and Activity Switching in a
Permanently Online and Permanently Connected Ecosystem. In P. Vorderer, D. Hefner, L.
Reinecke, & C. Klimmt (Eds.), *Permanently Online, Permanently Connected: Living and
Communicating in a POPC World* (pp. 83–94). New York, NY: Routledge.

Eberth, J., & Sedlmeier, P. (2012). The Effects of Mindfulness Meditation: A Meta-Analysis.
Mindfulness, *3*(3), 174–189. https://doi.org/10.1007/s12671-012-0101-x

Feldman, G., Greeson, J., Renna, M., & Robbins-Monteith, K. (2011). Mindfulness predicts less
texting while driving among young adults: Examining attention- and emotion-regulation motives
as potential mediators. *Personality and Individual Differences*, *51*(7), 856–861.
https://doi.org/10.1016/j.paid.2011.07.020

Gardner, B., Abraham, C., Lally, P., & Bruijn, G.-J. de (2012). Towards parsimony in habit
measurement: Testing the convergent and predictive validity of an automaticity subscale of the
Self-Report Habit Index. *International Journal of Behavioral Nutrition and Physical Activity*, 1–
12. Retrieved from http://www.ijbnpa.org/content/9/1/102

Germer, C. (2004). What is Mindfulness? *Insight Journal*, 24–29.

Gorman, T. E., & Green, C. S. (2016). Short-term mindfulness intervention reduces the negative

   attentional effects associated with heavy media multitasking. *Scientific Reports*, *6*, 24542.

   https://doi.org/10.1038/srep24542

Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction

   and health benefits. *Journal of Psychosomatic Research*, *57*(1), 35–43.

   https://doi.org/10.1016/S0022-3999(03)00573-7

Hefner, D., & Vorderer, P. (2017). Digital Stress: Permanent Connectedness and Multitasking. In L.

   Reinecke & M. B. Oliver (Eds.), *Routledge handbooks. The Routledge handbook of media use and

   well-being: International perspectives on theory and research on positive media effects* (pp. 237–

   249). New York, London: Routledge.

Kang, Y., Gruber, J., & Gray, J. R. (2013). Mindfulness and De-Automatization. *Emotion Review*,

   5(2), 192–201. https://doi.org/10.1177/1754073912451629

Klimmt, C., Hefner, D., Reinecke, L., Rieger, D., & Vorderer, P. (2018). The permanently online and

   permanently connected mind: Mapping the cognitive structures behind mobile internet use. In P.

   Vorderer, D. Hefner, L. Reinecke, & C. Klimmt (Eds.), *Permanently online, permanently

   connected. Living and communicating in a POPC world.* (pp. 18–28). New York, NY: Routledge.

Levy, D. M., Wobbrock, J. O., Kaszniak, A. W., & Ostergren, M. (2012). The Effects of Mindfulness

   Meditation Training on Multitasking in a High-Stress Information Environment. *Proceedings -

   Graphics Interface*, 45–52.

Michalak, J., Zarbock, G., Drews, M., Otto, D., Mertens, D., Ströhle, G., . . . Heidenreich, T. (2016).

   Erfassung von Achtsamkeit mit der deutschen Version des Five Facet Mindfulness Questionnaires

   (FFMQ-D). *Zeitschrift Für Gesundheitspsychologie*, *24*(1), 1–12. https://doi.org/10.1026/0943-

   8149/a000149

Panek, E. T., Bayer, J. B., Dal Cin, S., & Campbell, S. W. (2015). Automaticity, mindfulness, and

   self-control as predictors of dangerous texting behavior. *Mobile Media & Communication*, *3*(3),

   383–400. https://doi.org/10.1177/2050157915576046

Reinecke, L., Aufenanger, S., Beutel, M. E., Dreier, M., Quiring, O., Stark, B., . . . Müller, K. W. (2016). Digital Stress over the Life Span: The Effects of Communication Load and Internet Multitasking on Perceived Stress and Psychological Health Impairments in a German Probability Sample. *Media Psychology*, 1–26. https://doi.org/10.1080/15213269.2015.1121832

Reinecke, L., Klimmt, C., Meier, A., Reich, S., Hefner, D., Knop-Huelss, K., . . . Vorderer, P. (2018). Permanently online and permanently connected: Development and validation of the Online Vigilance Scale. *PLOS ONE*, *13*(10), e0205384. https://doi.org/10.1371/journal.pone.0205384

Russo, M., Ollier-Malaterre, A., & Morandin, G. (2019). Breaking out from constant connectivity: Agentic regulation of smartphone use. *Computers in Human Behavior*, *98*, 11–19.

Schnauber-Stockmann, A., & Naab, T. K. (2019). The process of forming a mobile media habit: results of a longitudinal study in a real-world setting. *Media Psychology*, *22*(5), 714–742. https://doi.org/10.1080/15213269.2018.1513850

Throuvala, M. A., Griffiths, M. D., Rennoldson, M., & Kuss, D. J. (2020). Mind over Matter: Testing the Efficacy of an Online Randomized Controlled Trial to Reduce Distraction from Smartphone Use. *International Journal of Environmental Research and Public Health*, *17*(13). https://doi.org/10.3390/ijerph17134842

Walsh, S. P., White, K. M., & Young, R. M. (2009). The phone connection: A qualitative exploration of how belongingness and social identification relate to mobile phone use amongst Australian youth. *Journal of Community & Applied Social Psychology*, *19*(3), 225–240. https://doi.org/10.1002/casp.983