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When Mindfulness Guides IS Users Toward a Values-Consistent Pro-Environmental Life

*Special Interest Group on Green Information Systems
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Abstract

Information technologies are central to addressing environmental challenges. However, adopting Green Information Systems (IS) is challenging given the behavioral adjustments required and the difficulties surrounding the generation of effective, long-lasting pro-environmental behaviors. We propose mindfulness and psychological flexibility as internalizing mechanisms that empower users to become active agents of change by nourishing essential environmental shifts from within. We explore mindfulness and psychological flexibility mechanisms, together leading to the ability to enact a mindful and values-consistent life. We plan to conduct an online experiment with a volunteer computing platform through which users can execute resource-intensive sustainability modeling. This work-in-progress' contribution to the Green IS literature is threefold: it introduces mindfulness and psychological flexibility to the field; it aims to provide empirical evidence for encouraging pro-environmental behaviors; and it addresses several current methodological limitations by proposing to conduct a randomized controlled group experiment with an objective measure of Green IS usage.

Keywords

Green IS, Volunteer Computing, Mindfulness, Psychological Flexibility, Pro-Environmental Behavior

Extended Abstract

Information technologies and systems are key to addressing environmental challenges, notably by empowering individuals with access to information and the means for pro-environmental actions (Cherki El Idrissi and Corbett 2016; Elliot and Webster 2017). Thus, users are agents of change, and their actions represent a lever for Green Information Systems (IS) success. However, adopting Green IS may not always be as simple as it "compels individuals [...] to change their behavior, attitude and other different aspects" (Singh and Sahu 2020, p. 6). Interventions such as contextual, financial, and informational are shown to influence behaviors. However, external motivational sources can encourage passive compliance (Patel and Holm 2018) and may not generate effective and long-lasting pro-environmental behaviors (PEBs) compared to internalized factors (Thiermann and Sheate 2020). When interventions aimed at externally motivating actions are removed, rebound effects resulting in lower PEBs may materialize (Staples et al. 2020). In sum, external pressures may ignite a spark of change but may not result in the most needed environmental shift propelled by individual actions and involvement. That shift may come from within (Wamsler et al. 2018).

Mindfulness, or the "moment-to-moment nonjudgmental awareness" (Kabat-Zinn 2009, p. xlix), offers an interesting lens through which the internalization of PEBs may materialize. For instance, it has been associated with increases in subjective wellbeing, which lessen the necessity for materialistic rewards in this regard (Ericson et al. 2014). However, a significant limitation of the mindfulness-sustainability literature is that empirical insights often fail to support theoretical predictions (Thiermann and Sheate 2021). The few studies looking into mindfulness and PEBs offer mixed results, with some showing support (e.g., Ray et al. 2021) and others no support (e.g., Geiger et al. 2020). This could be due to methodological limitations and suggests the presence of mediators and moderators (Fischer et al. 2017; Geiger et al. 2019). The currently ambiguous role of mindfulness in PEBs may also stem from the nature of the construct. Indeed, mindfulness is not outcome-oriented: one practices mindfulness "to be where one already is and to know the inner and outer landscape of the direct experience in each moment," not necessarily to improve or fix anything in one's life (Kabat-Zinn 2003, p. 148). Hence, mindfulness may be a necessary but insufficient mechanism with respect to behavioral effectiveness, meaning one requires more than a mindful state to act upon their pro-environmental consciousness (Bond et al. 2008).

To understand mindfulness' role in generating efficient and long-lasting PEBs, we borrow from the construct of psychological flexibility (PF). PF, or "the ability to contact the present moment more fully as a conscious human being, and to change or persist in behavior when doing so serves valued ends", builds on mindful elements and leads one toward enacting a mindful and values-consistent life through commitment in action (Hayes et al. 2006, p. 7). More specifically, its value component draws from mindful elements and helps one maintain "contact with one's deeper priorities" (Rogge and Daks 2021, p. 703), ultimately giving direction to behaviors. Thus, PF might be one of the missing elements involved in the interplay between mindfulness and PEBs (Raymond and Raymond 2019). While PF is seemingly absent of the discourse on sustainability, the mindfulness and PF "literatures have converged upon a set of interrelated processes robustly linked" to similar individual outcomes (Rogge and Daks 2021, p. 702). Hence, we expect the two theoretical lenses to offer complementary insights into the processes leading to IS-supported PEBs, such as value activation and congruency (Raymond and Raymond 2019).

We ask one overall question: How can mindfulness influence IS-supported PEBs? Underlying this question is the conviction that we must prepare users "to become the transitioning force rather than remain passive receivers of environmental policies and behavioural adjustments" (Thiermann and Sheate 2020, p. 2). To address our question, we develop a model (Figure 1) to explore how mindfulness influences IS-supported PEBs, exploiting PF's action-oriented nature to articulate mindful mechanisms through value activation.

In the model, although we recognize the role of users' pre-existing pro-environmental values (PEVs), we help initiate the process of encouraging PEBs with a mindfulness intervention, that is, with guided meditation. We expect that this intervention will increase a user's state of mindfulness, that is, the mechanisms of non-reactivity, observing, acting with awareness, describing, and non-judging (Baer et al. 2006). Next, we expect that a user's state of mindfulness will help activate his/her pre-existing values for the following reasons. Observing enables one to objectively reflect upon, rediscover, and choose one's own personal values instead of relying upon socially conditioned values (Shapiro et al. 2006). Acting with awareness (i.e., a decline in automatic processing and heightened attention toward behavior) empowers

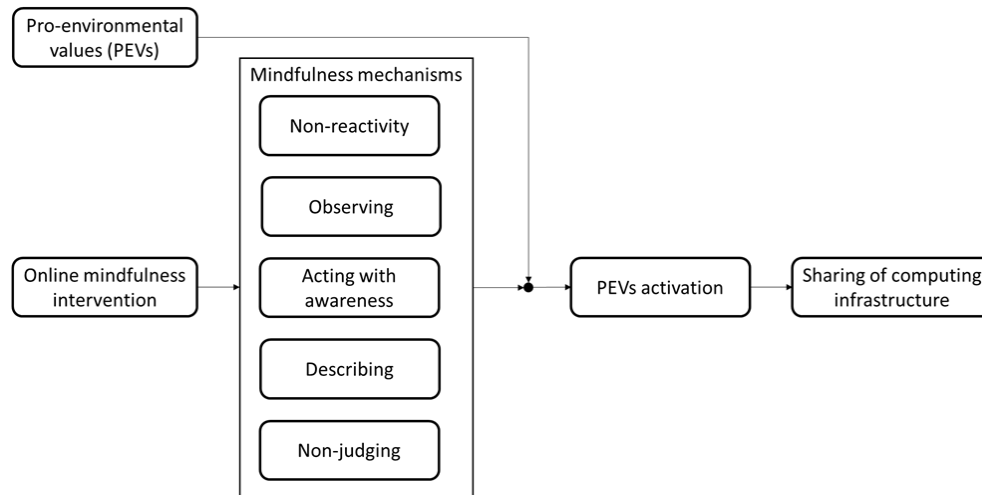


Figure 1 - Research model

one in considering options aligned with reflectively (instead of reflexively) chosen values (Brown and Ryan 2003; Shapiro et al. 2006). Through non-reactivity (the tendency to notice internal stimuli without getting stuck on them) and non-judging (taking a non-evaluative stance toward internal stimuli and maintaining a broader perspective), internal events can be watched more dispassionately, enabling one to more easily face conditioned impulses and behave in accordance with one's values (Baer et al. 2006; Hayes et al. 2006; Richter and Hunecke 2020). Describing helps one label internal experiences with words and constructively reflect on personal goals (Richter and Hunecke 2020). Hence, describing also helps in maintaining greater contact with one's values through goal-directed actions. That is, through mindfulness, one can identify and act upon one's truer values, which in turn lead to a more values-consistent life (Hayes et al. 2006). Hence, mindfulness does not necessarily result in more positive PEVs, but instead activates existing values. Consequently, we propose that the confluence of one's mindful state and PEVs provide the conditions necessary for one's PEVs activation and the resulting PEBs. Put differently, if one has positive PEVs, then mindfulness can make them salient, thereby leveraging them. By activating users' values, we expect a strong relationship between their values and actions (PEBs), as theorized in the PF literature (Hayes et al. 2006).

We will conduct an online experiment using a mindfulness intervention for computing infrastructure sharing (CIS) users. CIS – often termed volunteer computing - harnesses large amounts of computational power from thousands of dispersed personal computers to solve challenging computational problems (Durrani and Shamsi 2014). Using a distributed computing logic, CIS has been successfully used to support research on climate change (e.g., Climateprediction.net). By facilitating access to users' idle hardware, CIS takes advantage of three Green IS levers. First, it can power resource-intensive sustainability modeling by "supply[ing] more computing power [...] than does any other type of computing" (Durrani and Shamsi 2014, p. 370). Second, CIS could reduce our dependency on data centers, one of the most energy-consuming computing activities (Jones 2018). CIS does not require battery backups, redundant power systems, or cooling infrastructure, which makes it a greener solution (Mengistu and Che 2019). Lastly, using already existing hardware, CIS reduces the need for building new data processing capabilities. On top of reducing resource consumption to build such sites, it also reduces e-waste adverse consequences (Forti et al. 2020). In sum, CIS holds great opportunities for users to leverage (reduce) the positive (adverse) outcomes of IS.

During our experiment, participants will use a CIS platform (<https://kingsds.network/>) to execute sustainability research. Assignment to our treatment and control groups will be random. For the treatment group, we will adapt the mindfulness intervention from Cavanagh et al. (2013) using Ray et al.'s (2021) nature mindfulness intervention. Specifically, Cavanagh et al. (2013) provide initial evidence of the effectiveness of a short web-based mindfulness intervention and Ray et al. (2021) pair nature sounds with mindfulness practice and successfully predict connectedness to nature (a construct related to PEVs: Fischer et al. 2017). Our intervention will consist of 14 days of online mindfulness training paired with these nature sounds. Participants will be provided with access to a virtual learning facility hosting daily 10-minute guided meditations with audio instructions inviting them to bring nonjudgmental awareness to their internal events, such as breath, thoughts, and feelings. Reminders encouraging daily practice and providing advice

will be sent every three days. Similar to the treatment group, the control group participants will read a short text about various topics accompanied with nature sounds once a day, for 14 days. In addition to measuring PEBs during the 14 days, we will conduct follow-up PEB assessments after 4 and 8 weeks to test for any spillover and rebound effects. We will use validated measures, including PEVs (de Groot and Steg 2008), mindfulness (adapting Baer et al. 2006 to a state measure), values activation (contact with values: Rolffs et al. 2018), PEBs (platform adoption and subsequent participation: Grenier Ouimet, 2021), and spillover and rebound effects (Staples et al. 2020). We will initially target about 200 participants, taking into account attrition and power calculations.

This work-in-progress introduces mindfulness and psychological flexibility to Green IS and proposes conducting a randomized controlled group experiment, measuring actual PEBs. It makes several potential contributions. First, although research has demonstrated weak effects for values (Gifford and Nilsson 2014), we develop a model explaining how to activate PEVs leading to PEBs. Second, while research theorizes the role of PF on PEVs (Raymond and Raymond 2019), the relationship has not yet received empirical attention. Third, studies on the role of mindfulness in PEBs face methodological limitations, such as having no control groups (e.g., Grabow et al. 2018) and relying on self-reports of PEBs (e.g., Ray et al. 2021): our study overcomes these limitations. Lastly, while Green IS research has examined factors seemingly similar to those integrated into our model, such as environmental awareness/concern (Graf et al. 2018), mindfulness and PF are firmly grounded in clinical behavioral science and offer a new perspective on the consolidation of ecologically responsible and efficient IS-related behaviors.

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