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COMMENTARY

Attention on the fritz? The influence of information and communication technology on attentional resources

Ricardo Brooks*, Gabrielle Danna, Huy Le, Gage Matyasovszky, Dhanisha Nandigama, and Jason G. Randall

Psychology Department, University at Albany, State University of New York, Albany, NY, USA
*Corresponding author. Email: rbrooks2@albany.edu

Anyone who has ever been interrupted mid task by a notification "ping" understands the deliberate attention-grabbing nature of information and communication technology (ICT). Unsurprisingly, ICT use in the workplace tends to carry a negative connotation (Richards, 2012). Yet, there are those who acknowledge some claims that *personal/nonwork*-oriented ICT use during work hours can benefit individual and organizational effectiveness (Coker, 2013; Ivarsson & Larsson, 2011). In this commentary, we draw from self-regulation and resource theories (Beal et al., 2005; Demerouti et al., 2001; Kanfer & Ackerman, 1989) to more critically examine just how beneficial it may be to use ICTs while at work. Specifically, we address claims regarding personal/nonwork ICT use at work and whether the pros (e.g., resource recovery and increased engagement) outweigh the potential harms (e.g., distraction, inattention) given that attention is a limited resource and off-task thought negatively affects performance (Randall et al., 2014). We further provide recommendations for practice and research to more successfully implement ICTs within the organizational context.

ICT use for nonwork purposes during work hours: Benefit or hindrance?

A common assumption is that nonwork-related ICT use during work hours is counterproductive, as evidenced by companies' willingness to sanction the behavior and terminate employees that use ICTs for nonwork purposes (Greenfield & Davis, 2002). Despite that, analyses of national archival data on full-time "computer-using workers" found that approximately 34% of employees were willing to use ICTs for personal communication during company time (Garrett & Danziger, 2008). Our review of claims made by Hu et al. (2021) and others concerning the positive or mixed benefits of employees' ICT use yielded some findings of ICT benefits, which tend to fall within the categories of ICT use for work or nonwork purposes and during work or nonwork hours (see Table 1). In our review of this literature, benefits of personal/nonwork use of ICTs during work hours were scant as evidenced by Hu et al. finding only two studies in this category. In light of this, we critically examine the evidence for the proposed claims that nonwork ICT use during working hours may benefit individual and organizational effectiveness.

Do ICTs *actually* facilitate resource recovery?

Studies conducted on personal/nonwork ICT use such as *workplace Internet leisure browsing* (WILB) frame this behavior as *intentional work breaks* and *recovery microbreaks* (Coker, 2013; Syrek et al., 2017) that provide employees with opportunities to recover attentional resources. Coker's (2013) use of multiseries vigilance tasks demonstrated that leisurely browsing

Table 1. Support for the Benefits of ICT Usage Across Varying Work/Nonwork Contexts

	Work hours	Nonwork hours
Work use	ICT use facilitates perceptions of increased connectivity and communication efficiency	ICT use facilitates recovery processes ICT use is positively associated with ambition and job involvement
Nonwork use	ICT use during breaks improves recovery (Coker, 2013); ICT use leads to increased engagement at the intraindividual level	Not reviewed/Not applicable

Facebook for 5 minutes between performance episodes led to greater efficiency in vigilance task completion (i.e., lower reaction time) when compared with alternative break options (e.g., no break, inactivity, or a negatively valenced task). Coker suggests that "enjoyability of breaks moderates the restoration of attentional restoration," signifying the benefits of WILB (Coker, 2013, p. 123). In addition, results indicated a positive relation between self-reported productivity and WILB for younger workers (i.e., 30 and younger) of office employees randomly selected from a commercial database of market research panelists. Although the findings are promising, positively valenced break experiences are not unique to ICT use. It is possible that alternative enjoyable breaks (e.g., a short walk or conversation with a colleague) may have been more restorative than WILB. Additionally, these findings were limited to intentional designated break times—not during times individuals should actually be working. Unfortunately, individuals report frequently using ICT for personal use during work hours, whether on a scheduled break or not, which is commonly called *cyberslacking* (Garrett & Danziger, 2008). Therefore, it remains unclear whether (a) ICT for personal use during *nonbreak* work hours is beneficial and (b) whether the potential benefits of ICT for recovery are similar to those of alternative break activities.

In order to address ICT use during unscheduled break hours, Syrek and colleagues (2017) conducted a field study using ecological momentary assessments to investigate the potential benefits of social media specific nonwork use of ICTs on engagement throughout the workday. Their results demonstrated that using ICTs for nonwork social media purposes had beneficial within-person effects on worker engagement in the subsequent hour of work within several episodes of performance. They use these findings to argue that using ICTs for personal purposes may serve as a form of microbreak to help recover resources, leading to enhanced work engagement. Interestingly, their findings also revealed (a) negative within-person concurrent effects of non-work-related social media use on worker engagement and (b) negative between-person effects of social media use on work engagement. Additionally, the concurrent effects of non-work-related social media use during work hours were typically larger than those of the lagged effect, leaving room to question just how beneficial the small positive effect was. Based on these findings, one could argue that non-work-related social media use actually reduces momentary and overall work engagement such that those who spend more time on social media are actually less engaged at work than those who spend less time on social media. Furthermore, the subsequent within-person increases in engagement could potentially be seen as a form of penance for allowing oneself to be distracted by social media previously. Thus, the claims that nonwork ICT use serves as a microbreak that recharges regulatory resources requires further exploration that situates it within the larger context of concomitant harm ICT use at work may also cause (e.g., reduced overall engagement).

ICT usage: Context matters

Although the evidence of the benefits of ICT use for personal/nonwork purposes seems far from conclusive, we do not necessarily support a shift away from ICT work integration. Instead, we caution against full work–ICT integration without careful consideration of the purpose and timing

of ICT usage. Many of the benefits of ICTs tend to fall outside the scope of *personal/nonwork* ICT use during work hours (see Table 1). Moreover, we call into question the strength of these limited findings. The attention-commanding nature of ICTs may actually negatively affect workers' ability to stay focused and recover. Individuals' inability to remain focused during the workday can lead to a number of negative cognitive, emotional, and behavioral outcomes (Beal et al., 2005; Randall et al., 2014). Therefore, claims concerning the attentional benefits of personal/nonwork ICT use must carefully weigh the pros and cons. This is especially true because being constantly "plugged in" takes a toll on our behavior, well-being, and relationships (Allcott et al., 2020; McDaniel & Radesky, 2018).

Recommendations for future research

Regarding future ICT research, we specifically identify what Hu and colleagues label the *"what" of work inattention* as a prime area in need of further exploration and call for researchers to draw on well-established theoretical frameworks to explain the mechanisms driving the mixed effects surrounding ICT use. In particular, resource recovery and self-regulatory theories (Beal et al., 2005; Demerouti et al., 2001) seem well suited for explaining ICT effects. Excessive ICT integration into the workplace may lead to increased *compensatory costs* via distractions or interruptions that disrupt task completion. These compensatory costs may strain individual attentional resources due to additional *performance protection strategy* enactment (e.g., attention narrowing or increased selectivity), leading to exhaustion (Bakker & Demerouti, 2014). Although not comprehensive, this example simply highlights one theoretical application to ICT use.

Any researcher will tell you that sound theory and a strong methodology go hand in hand, and ICT research is no exception. *Personal/nonwork* ICT use has shown some promise in the context of work (Coker, 2013; Syrek et al., 2017). However, existing research remains limited. We urge researchers to investigate the extent of these opportunities by conducting rigorous research to further tease apart the potential benefits and harms of ICT use for nonwork purposes during work hours. Could personal ICT use such as WILB *truly* restore resources needed during episodes of performance if used during work hours? Is intertwining the ICT and break literature the answer? Are there other recovery activities and methods that are better suited than ICTs for increasing engagement? We will not know until the data from further research provides clarity one way or the other. However, we see these questions as crucial given that employees will continue to use ICTs during work hours and admit to using them for personal purposes while on the clock (Garrett & Danziger, 2008).

Suggestions for effective ICT workplace integration

Organizations have continued to become more inundated with ICTs, effectively blurring the line between personal and professional device usage (Dettmers et al., 2016). Adding fuel to the fire, these devices become problematic *during* work because we understand that ICTs demand attention, tasks are resource limited, and off-task thought harms performance (Kanfer & Ackerman, 1989; Randall et al., 2014). Furthermore, we can view a typical workday as a series of performance episodes where employees expend these resources to enact cognitive self-regulation as task attentional pull, and off-task attentional demands (e.g., ICTs) fight for the same pool of limited attentional resources (Beal et al., 2005). Therefore, we provide the following recommendations for practice regarding nonwork related ICT use.

First, we recommend assessing the strategic use of one's ICTs to minimize distractions during the workday. For example, removing extraneous ICT devices from your work environment. If your device is out of reach then off-task distractions are less likely to occur, thereby increasing engagement and productivity. In the case of software (e.g., email), opt out of notifications and

disconnect personal emails from work devices to inhibit those all too frequent "pings" that interrupt workflow.

Second, we suggest increasing boundaries regarding the use of ICT devices. For instance, plan out when you will use your ICTs for nonwork purposes. If engaging with social media or calling a friend allows one to disengage from work and enjoy a restorative experience, then structure your work break accordingly. The more you commit to maintaining the boundary between work and play regarding nonwork-related ICT use, the fewer pulls on attention one may experience. As we mentioned, we do not view ICTs as "taboos" to be feared or heavily sanctioned because they may have beneficial purposes to serve. However, this depends on how strategically they are used to elevate individual and organizational effectiveness.

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