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Table of Contents

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EDITORIAL PREFACE

iv *Jo Lumsden, Aston University, Birmingham, UK*

RESEARCH ARTICLES

- 1 **Exploring Privacy Notification and Control Mechanisms for Proximity-Aware Tablets**
Huiyuan Zhou, Computer Science, Dalhousie University, Halifax, Canada
Vinicius Ferreira, Computer Science, Federal University of São Carlos, São Paulo, Brazil
Thamara Silva Alves, Computer Science, Federal University of São Carlos, São Paulo, Brazil
Bonnie MacKay, Computer Science, Dalhousie University, Halifax, Canada
Kirstie Hawkey, Computer Science, Dalhousie University, Halifax, Canada
Derek Reilly, Computer Science, Dalhousie University, Halifax, Canada
- 20 **BioCrystal: An Ambient Tool for Emotion and Communication**
Asta Roseway, Microsoft Research, Redmond, WA, USA
Yuliya Lutchyn, Microsoft Research, Redmond, WA, USA
Paul Johns, Microsoft Research, Redmond, WA, USA
Elizabeth Mynatt, Georgia Institute of Technology, Atlanta, GA, USA
Mary Czerwinski, Microsoft Research, Redmond, WA, USA
- 42 **Face-to-Face Matters: Inspirations from the Human Library**
Corey Jackson, Syracuse University, Syracuse, NY, USA
Yun Huang, Syracuse University, Syracuse, NY, USA
Abby S. Kasowitz-Scheer, Syracuse University, Syracuse, NY, USA
- 55 **Which Way is Up? How Locative Media May Enhance Sense of Place**
Glen Farrelly, Faculty of Information, University of Toronto, Toronto, Canada
- 67 **Out of Work, Out of Mind? Smartphone Use and Work-Life Boundaries**
Emily I.M. Collins, University College London Interaction Centre, London, UK
Anna L. Cox, University College London Interaction Centre, London, UK
Ruby Wootton, University College London Interaction Centre, London, UK
- 78 **Participatory Design: How to Engage Older Adults in Participatory Design Activities**
Lilit Hakobyan, Aston University, Birmingham, UK
Jo Lumsden, Aston University, Birmingham, UK
Dympna O'Sullivan, City University London, London, UK
- 93 **Enhancing Self-Reflection with Wearable Sensors Workshop: A Commentary on the ACM MobileHCI 2014 Workshop**
Genevefa Kefalidou, University of Nottingham, Nottingham, UK
Vicky Shipp, University of Nottingham, Nottingham, UK
James Pinchin, University of Nottingham, Nottingham, UK
Alan Dix, University of Birmingham, Birmingham, UK

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Out of Work, Out of Mind? Smartphone Use and Work-Life Boundaries

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ABSTRACT

Smartphones are now ubiquitous and valuable in many professions and yet have also been blamed for creating an 'always on' culture, blurring boundaries between work and home. Research has shown that checking e-mails out-of-hours via computer makes workers feel more overloaded with work but also increases their sense of coping. A total of 94 participants completed a survey exploring whether the same pattern would emerge for accessing e-mail on smartphones, showing that those who use smartphones for work e-mail experienced lower levels of overload, but not coping, and push notifications were associated with greater use of smartphones for e-mail. However, there were no significant correlations between coping or overload and e-mail use or quantity, suggesting that lower overload is not due to the ability to processes or read more e-mails outside of work.

Keywords: Coping, Overload, Smartphones, Stress, Work E-Mail

INTRODUCTION

Mobile technologies have played an indisputably important role in improving the level of flexibility open to workers. Employees are now better able to time journeys around rush hours, contribute to workloads while in other locations and perform important tasks outside of working hours. This contrasts sharply with the workplaces of even a decade ago, which relied much more heavily on geographic location and access to equipment or information that would only be available in the office. Some have argued that this necessity created a clear temporal and spatial separation between work

and home contexts (David, Bieling, Böhnstedt, Jandt, Ohly et al., 2014); one could not simply reply to messages from colleagues while at home in the evening, as there would be no way of knowing this message had even been left. Now, however, technological advancements in terms of the availability, capabilities and uptake of mobile and internet enabled devices have meant that there are very few tasks that cannot be completed from home, or indeed any other location. The devices themselves are also crossing boundaries, and have become integrated in both work and home contexts, with laptops being used for both PowerPoint presentations and for contacting friends (Towers, Duxbury, Higgins

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& Thomas, 2006). While this improvement in technology has occurred across a number of devices, the one that has arguably had the largest impact is the rise of smartphones, which have been revolutionary in their ability to provide perpetual contact for employees needing to be contactable wherever they are.

However, this also challenges the extent to which the boundaries of work and home can be enforced by factors such as time and location, which were once much more rigid. Smartphones not only allow access to work related information and e-mail from any location and at any time, but they also actively alert users to incoming information through notifications, potentially interrupting other activities. Many have argued that this results in a blurring of boundaries and a collective re-evaluation of working hours (Makinson, Feldhaus, Hundley & Fernandez, 2012). With approximately 64% of the UK population owns smartphones (ComScore, 2013), and almost half of these users report using their smartphone for work-related purposes (MacCormic, Dery & Kolb, 2012), constant connectivity is fast becoming the norm, creating an environment that may not be conducive to maintaining boundaries.

Far from simply being an annoyance, several have argued that this permeability of boundaries may have several negative consequences. For instance, interruptions from one domain while in another may create confusion about what role should be being performed, resulting in a lack of disengagement and problems immersing oneself in the current role (Ashforth, Kreiner & Fugate, 2000). Hall and Richter (1988) argue that non-distinct work-home boundaries also results in having to feel present in both work and home contexts simultaneously, despite the different expectations and responsibilities that come with each. Unsurprisingly, this has been posited to create problems with work-life conflict, in which the stresses and worries of one domain transfer to another (Fenner & Renn, 2004). This has been supported by research specifically focusing on mobile technologies, which has argued that own-

ing such devices makes maintaining boundaries more difficult and that using mobile phones may encourage more negative spill-over from work into the context of home (Chesley, 2005).

While smartphones can be used for a variety of work (and non-work) related purposes, one of the functions that receives the most attention in the area of work-balance is e-mail. E-mail is now the main method of communication (Hole, 2008), and the vast majority of knowledge workers check their e-mails frequently due to the volume of messages they receive (Davenport, 2008). This pattern extends to e-mail on smartphones, and as many as 63% of surveyed users report that using a smartphone has caused an increase in the demands in their work communicated by e-mail (Towers et al., 2006; Madden & Jones, 2008). Just over half of smartphone owners report to check their device at least once every hour (Lookout, 2012), indicating that not only are smartphones widespread, but they are also heavily engaged with. The fact that having e-mail on smartphones enables colleagues to contact employees at any time of the day has led to workers feeling that they are expected to provide instant responses to any e-mails they receive, whatever the hour (Mazmanian, Yates & Orlikowski, 2006), and consequently, it has been argued that it is e-mail in particular that often blurs the boundaries between work and home (Capra, Khanova & Ramdeen, 2013) and make it harder to disconnect from work when at home (Madden & Jones, 2008).

This is possibly unsurprising considering how well integrated the use of mobile technologies has become in the home domain. Many workers report that the first thing they do when they wake up is check their e-mails (Middleton & Cukier, 2006), and the use of e-mail outside of work hours has become a normal and accepted part of individuals' job roles (Allen & Shoard, 2005). This perceived normality does not, however, prevent this from possibly being an issue; family and friends of those using mobile devices for work e-mail during their spare time report to react to this negatively, as something that is annoying, anti-social and ad-

dictive, thus creating the potential for conflict with other members of the household (Turel, Serenko & Bontis, 2011).

It is not just the extra demands received that encourage the erosion of boundaries, but also the ease with which e-mail can be accessed; smartphone users have been found to be more likely to check e-mails at weekends, on sick days and on holiday compared to those without smartphones due to the increased accessibility of e-mail applications (Madden & Jones, 2008; Olson-Buchanan & Boswell, 2006). Moreover, many users have push notifications to alert them to incoming e-mails, actively attracting their attention towards their smartphones, and away from other activities (Sahami Shirazi, Henze, Dinger, Pielot, Weber & Schmidt, 2014). This encourages the user to at least read, if not reply, to each e-mail. Indeed, Middleton and Cukier (2006) report that when receiving a notification, users find resisting the urge to check the message very difficult, and would therefore usually attend to their device as soon as it happened. This behavior occurs despite just over half of smartphone users reporting no overt pressure from employers to provide immediate replies (Madden & Jones, 2008), although many report that they do so because of there being no valid excuse to not; the sender will know they would have received the e-mail, and thus a late or absent reply indicates that they have read and then dismissed their message (Middleton & Cukier, 2006). Therefore, for some, simply owning devices with these capabilities is sufficient to encourage more frequent monitoring.

While these issues are undoubtedly a concern, there may also be positive consequences of smartphone ownership. For instance, it has been argued that mobile technology is only a negative influence on work-home interference and family conflict for those with poor time management skills (Fenner & Renn, 2010) and not for others. Moreover, Yun, Kettinger and Lee (2012) found that although employees did experience stress as a result of the increased work load caused by smartphones, this was not the case when the smartphones used to assist with their work. When they were, this allowed

users to become more productive, resulting in lower levels of stress. Users themselves have also reported benefits to being connected to their e-mails, alongside the aforementioned negatives. The unrivalled flexibility in particular is seen as an asset and one of the main advantages to using smartphones for work e-mail, and users report to feeling that the sacrifice of a home free from work-related intrusions is a fair trade for this benefit (Allen & Shoard, 2005; Madden & Jones, 2008). Users are also quick to defend their e-mail behaviors, arguing that they were liberating and provided reassurance, peace of mind and a sense of control (Mazmanian, Orlikowski & Yates, 2005; Middleton & Cukier, 2006), and others have argued that they in fact improve their ability to do their job (Madden & Jones, 2008).

This double-edged effect of using accessing work e-mail outside of working hours is best demonstrated by Barley, Meyerson and Grodal (2011), who report that the amount of time spent processing e-mails outside of work hours is correlated with an increased sense of overload. Conversely however, Barley et al (2011) also report a positive correlation between the number of e-mails processed and an increased sense of coping. This suggests that while feeling as though non-work time is being wasted on e-mails may create greater stress, being able to process these e-mails can create a sense of control over work demands, reducing anxiety. However, this is yet to be investigated in terms of smartphone use, and so how this translates to mobile technology is currently unclear. This is therefore the focus of the present investigation.

It is likely that several differences exist in e-mail behaviors between those accessed on a computer and those accessed on a smartphone. For instance, despite technological advancements in smartphones, they still remain restricted in the kinds of information they can access or conveniently display, and this may prevent users from being able to successfully deal with certain e-mails (Karlson, Iqbal, Meyers, Ramos, Lee & Tang, 2010). Indeed, smartphones appear to be used primarily to check and prioritize e-mails, rather than to process them

(Matthews & Pierce, 2009), indicating that there may be differential outcomes of spending time accessing e-mails on smartphones compared to computers. Moreover, the ways in which smartphones have become integrated into both work and home lives, as well as how widespread their use is, has dramatically changed in recent years, requiring more timely research to be conducted.

In line with this research, it was hypothesized that:

1. Smartphone users will spend more time processing email outside of work, and will process a greater number of e-mails than non-smartphone users;
2. Smartphone use will be associated with a greater sense of coping, but also a greater sense of overload.

METHOD

Participants

A total of 94 adults (54.3% male) completed the questionnaire, all of whom were in full time employment and had work e-mail accounts. An additional 19 did not complete the survey and so were excluded. The final participant group were aged between 20 and 69 ($M=39.23$, $S.D.=11.37$), and were recruited through e-mail mailing lists (mostly those relating to professions likely to use e-mail) and social networking sites. The majority (87.2%) owned smartphones, 73.4% used smartphones to access their work e-mail and 54.3% received automatic notifications on their smartphones for work e-mail.

Materials

In line with previous research (Barley et al., 2011), work stress was measured using two different constructs. The first was overload, which was assessed using the five item Emotional Exhaustion subscale of the Burnout Inventory ($\alpha=.86$; Maslach & Jackson, 1981). This

comprised of five items, and was answerable on a five point scale according to how often the participant experienced the outlined feelings in the last three months, ranging from 1 (“never”) to 5 “very often”. It included questions relating to experiences such as feeling emotionally drained or burned out from work, for example “How frequently in the last three months have you felt used up at the end of the work day?”. The second construct was coping, assessed by the three item Coping/Mastery scale ($\alpha=.63$; Families and Work Institute, 1992), which was also answerable on a five point scale ranging from 1 (“never”) to 5 (“very often”). This scale focused on experiences such as feeling confident about abilities to solve problems, asking questions such as “How frequently in the last three months have you found that you could not cope with all the things you had to do?”. Coping and overload have been found to be distinct but negatively correlated constructs (Barley et al., 2011; Price, 2010), and including both allowed the investigation of the potentially double edged associations of smartphone e-mail use.

Participants answered further 30 questions on their smartphone and e-mail use. These included questions answerable by ‘yes’ or ‘no’, relating to whether the respondent owned a smartphone, used work e-mail, accessed work e-mail on their smartphone, check e-mail outside of work and whether they have push notifications enabled. The remaining questions asked participants to estimate the amount of time spent on e-mails and the number of e-mails sent, received and dealt with on their smartphones and PCs. Each question was asked for both the average work day (although out of working hours) and average day off. Participants were also asked to provide an estimate for the percentage of e-mails fully dealt with (that is, those that would not need to be looked at again because the required action was made) on their smartphone and PC. Previous research has reported high correlations between self-reported and actual e-mail behaviors (Szanja, 1996), and this is an approach adopted in similar studies.

Procedure

The questionnaire was hosted by Qualtrics online survey software, and all scales were presented in a random order.

RESULTS

Smartphone E-Mail Use and Work Stress

A one way ANOVA was used to explore differences in work stress and e-mail behaviors between those who accessed work e-mail on smartphones and those who did not. The analysis demonstrated that those who accessed work e-mail on smartphones (n=69) reported less overload ($F_{1,93}=5.72, p<.05$). There was no difference between the groups in relation to coping. Means and standard deviations can be found in Table 1.

When comparing the two groups (those with and those without work e-mail on their smartphones) on the amount of time spent on e-mail and the number of e-mails read, sent

and received outside of working hours, no significant differences emerged (see Table 2).

E-Mail Behaviors and Work Stress

To explore the more general relationship between e-mail behaviors and work stress, as well as investigate the possible impact on e-mail volumes on these measures, a Pearson’s correlation analysis was performed. There were, however, no significant correlations between either overload or coping and time spent on e-mail (on a computer or smartphone), or the number of e-mails sent, received or read outside of work.

Push Notifications

Due to the previous work on the impact of push notifications (Middelton & Cukier, 2006; Sahami Shirazi, et al., 2014), comparisons were also made between those who had these enabled (n = 51) and those who did not (n = 18), within the smartphone e-mail group (see Table 3). A one-way ANOVA found that those with notifications enabled spent more time accessing e-mail

Table 1. Means and standard deviations for stress measures according to whether work e-mail is accessed on smartphones outside of work

E-mail behaviors	Work E-Mail on Smartphone		
	No	Yes	Overall
Overload score	17.16 (4.26)	15.09 (3.50)	15.64 (3.81)*
Coping Score	10.36 (2.02)	10.80 (2.48)	10.68 (2.37)

Note: *p<.05, **p<.01

Table 2. Means and standard deviations for e-mail behaviors according to whether work e-mail is accessed on smartphones outside of work

E-Mail Measures	Does not Access E-Mail on Smartphone	Accesses E-Mail on Smartphone
Total time	2.69 (3.02)	4.14 (5.70)
Total read	25.52 (39.56)	54.57 (88.45)
Total sent	12.66 (15.49)	18.37 (20.97)
Total received	34.76 (42.56)	109.12 (244.60)

Note: *p<.05, **p<.01

Table 3. Means and standard deviations of e-mail behavior measures across those with enable notifications and those without

E-Mail Behaviors	Notifications Enabled	Notifications not Enabled
Total time	4.91 (6.36)	1.94 (2.03)
Total received	102.69 (251.29)	127.33 (230.45)
Total read	56.95 (96.62)	47.83 (61.39)
Total sent	18.87 (21.34)	16.94 (20.43)

Note: * $p < .05$, ** $p < .01$

on their smartphones ($F_{1,68} = 5.60, p < .05$), in particular on workdays ($F_{1,68} = 6.59, p < .05$), and sent more e-mails on smartphones on workdays ($F_{1,68} = 4.15, p < .05$). The difference between the groups in terms of the total amount of time spent on e-mail also approached significance ($F_{1,68} = 3.77, p = .056$).

They did not, however, differ in any other e-mail behaviors, nor in the stress outcome measures (see Table 4).

DISCUSSION

The study aimed to address the lack of recent investigation into smartphone e-mail use and the possible relationship with stress, as measured by overload and coping. Those who accessed work e-mail on their smartphones outside of work scored significantly lower in overload than non-users. They also spent less time accessing e-mail on their computers and received more e-mails on their days off and read more e-mails than non-users. However, contrary to predictions, smartphone e-mail users and non-users did not differ in their sense of coping, nor was there a relationship between either the number of e-mails processed. There was also no observed

association between the amount of time spent on e-mail and either coping or overload.

This goes some way to suggest that while fluid boundaries between home and work contexts may be a negative influence in some contexts (e.g. MacCormick et al., 2012), this may not necessarily be the case in terms of work e-mail. Despite allowing work e-mail (and consequently work-related tasks), to intervene in home contexts, the only association with stress appeared to be a positive one. Although causality cannot be established by this study, our findings suggest that accessing e-mail on a smartphone may reduce overload, irrespective of the number of e-mails processed. This may be due to the knowledge that wherever an individual is, they will still be able to access their e-mails and keep track of possible tasks for the next day. Maintaining an awareness of their inbox and being able to triage e-mails while away from the office may also prevent individuals feeling overwhelmed by allowing them to avoid having to process a long list of e-mails when returning to their desk. This reflects previous assertions that accessing e-mail on smartphones is capable of increasing feelings of control, flexibility and a peace of mind (Middleton & Cukier, 2006).

Table 4. Means and standard deviations of work stress measures across those with enable notifications and those without

	Notifications Enabled	Notifications not Enabled
Overload	15.08 (3.58)	15.11 (3.36)
Coping	10.73 (2.49)	11.00 (2.52)

Note: * $p < .05$, ** $p < .01$

Conversely, it is possible that those who feel less overloaded are more likely access e-mail on their smartphones, although this appears less plausible. Regardless, future research should aim to establish the direction of this relationship.

The findings also indicate that in some situations (for instance, checking e-mail on days off), smartphones may operate as a replacement for accessing e-mail on computers, rather than encouraging more flexible boundaries themselves. This was evident as despite having increased access to e-mails and despite feeling less overloaded, smartphone owners in fact did not read, process or send any more e-mails than those who did not use smartphones for e-mail. This is in line with arguments that although using e-mail enabled devices facilitates the intrusion of work into home spaces, it does not create these habits. Middleton and Cukier (2006) for example, state that these devices simply make enacting the urges to maintain constant connectivity easier for those who would want to do this anyway. Therefore, not only does this suggest the practice of e-mail outside of work does not necessarily need to be discouraged (at least in relation to overload and coping), but if a company does wish to do this, it would need to implement alternative strategies other than removing smartphones.

Push notifications may, however, be more influential than simply using a smartphone for e-mail; those with push notifications were found to engage significantly more with their e-mail on their smartphones. Push notifications have previously been reported to provide substantial distractions from other activities (Sahami Shirazi, et al., 2014), and users tend to be unable to resist the urge to check their smartphones once they receive one (Middleton & Cukier, 2006), suggesting that they may increase smartphone e-mail use through actively cueing users to access e-mails. They may, therefore, be more actively involved in violating work-home boundaries in a less voluntary manner. If this is the explanation for this relationship (rather than those who wish to send more e-mails being more likely to use push notifications), this would provide some evidence that push

notifications should be disabled in order to limit engagement with e-mail outside of work hours. That said, the lack of association between enabled notifications and overload or coping indicates that it has a limited impact on stress. Therefore, based on the present evidence, there would be little reason to encourage notifications to be disabled, especially considering the high frequencies with which many users check their smartphones anyway (Lookout, 2012). However, previous research on the effect of being interrupted by e-mail suggests that users can take a considerable amount of time to recover from the interruption and return to their previous task at the same rate (Jackson, Dawson & Wilson, 2001). Therefore, while not associated with overload or coping, future research may wish to investigate the influence of push notifications on other factors, such as work-home interference, or family conflict.

The lack of a difference between smartphone users and non-users in coping was unexpected. This contradicts the previous findings of Barley et al (2011), who found that the amount of time spent processing e-mails outside of work hours was correlated with an increased sense of overload but also that the number of e-mails processed was correlated with an increased sense of coping. Several explanations for this exist. First of all, the measurement of e-mail use differed between the present finding and this may have impacted on the results; Barley et al (2011) employed the use of a diary over the course of three days, whereas we simply asked for self-reported estimates. While there is evidence for a high concordance between self-reported and actual e-mail usage (Gerpott, 2011), it is possible that differences may still emerge between one time estimates and daily diaries, which may pick up day-to-day variations.

The relatively diverse sample used in the present study may also have been influential in generating different findings to those reported previously (e.g. Barley et al., 2011), as this research tended to focus on employees of one specific company or those in the same office. There are likely to be useful insights gained from

this approach and studying specific industries or roles will ensure factors such as level of responsibility, importance of remaining connected to e-mail and volume of e-mails remained constant across participants. However, the present study aimed to uncover overall trends, as opposed to those generalizable only to a specific company, and operated under the assumption that due to the widespread importance of e-mail, approaches to e-mail may be relatively similar across a wide variety of professions. That said, the present sample demonstrated similar means for the amount of time spent on e-mail and volume of e-mail as previous studies but also much larger standard deviations, and therefore the diversity of the sample was indeed reflected in the data. The considerable extent of individual differences that this represents has been noted in previous literature in relation to more general e-mail behaviors and approaches (e.g. Dabbish, Kraut, Fussell & Kiesler, 2005), and so is in line with existing literature.

It is also important to note that much of the previous research on this topic has relied on data collected before smartphones were so widely owned and used (for example, Barley et al., 2011 for which the data was collected in 2001 and 2002), and this may be the reason for the lack of expected difference in coping between those who use smartphones for work e-mail and those who do not. It is likely that in modern day workplaces, individuals are more aware and mindful of the fact that e-mails will be received instantly, irrespective of location than they were when only a limited number of people owned smartphones. This may have led to practices that reduce the level of stress experienced as a result of receiving these e-mails outside of the workplace, for instance, stating how important it is for the receiver to reply or specifying that this does not need their attention until they return to the office. Alternatively, being more used to receiving this kind of information while outside of work may have allowed employees to adapt and feel less stressed when this occurs. Either way, this could have led to individuals preventing interruptions from their smartphones permeating boundaries

to the extent that stress is caused. The differences in the level of adoption at the time of data collection may also impact on the kinds of people who are likely to own and use smartphones. Early adopters of technology are likely to be more open to technology, have greater social mobility and greater self-efficacy (Hoffman, 2011), and therefore those using e-mail on smartphones before they were so widely used may be vastly different from those reporting to use them now. While this does not necessarily explain the specific findings discussed here, especially as studies on early adopters mostly reported negative outcomes, it does highlight a possible reason for different results emerging from such different samples.

Whatever the reason for the discrepant findings, the present results would indicate that neither the volume of e-mail nor the time spent processing it are related to stress, as measured by coping and overload. One possibility is that when individuals experience increasing volumes of work, or require a greater level of engagement with their e-mail, rather than experience greater overload or reduced coping, many are able to adapt to the increasing demands. Therefore, e-mail behaviors will fail to be associated with coping or overload, whereas strategies such as owning smartphones would be.

Limitations

The most notable limitation of the present study is the lack of an objective measure of e-mail use, both in terms of the amount of time spent on e-mail and the number of e-mails received, read and processed. Previous work has established that self-reports of e-mail use are relatively reliable (Gerpott, 2011), although using tracking software such as RescueTime or Xobni would no doubt improve accuracy and remove the potential for bias. Furthermore, widening the scope to include e-mail accessed on other devices such as may better reflect the role of mobile technology in e-mail.

It must also be noted that, in contrast to some previous studies conducted prior to mass-

adoption, it is now the case that those who do not own smartphones are very much in the minority. Even outside of the workplace, smartphones are readily available and heavily marketed, with many believing that they are necessary for simply functioning in modern society, regardless of whether their employment requires it. Therefore, those resisting this trend may form a group that differs substantially from smartphone users on many factors other than simply owning a smartphone. For instance, they are more likely to be resistant to technology overall (Rogers, 2003). As the differences between users and non-users is likely to intensify even further in the future, studies may wish to focus instead on other variables, such as the amount of time spent on the smartphones, rather than simply if they are owned or not.

Moreover, the present study did not measure smartphone use outside of e-mail behaviors. One possibility for the finding is that those who use smartphones for e-mail are also more likely to use them for recreational or social activities, and this may be the cause of the lower overload in this group. Indeed, previous research has reported that use of smartphones for entertainment may reduce stress due to these activities offering relaxation and escapism (Kim, Seoh, Lee, & Lee, 2010), and that users do tend to use these devices for games, music and social networking sites as well as e-mail (Smith, 2011). Therefore, future research may wish to incorporate measures of alternative uses as well as e-mail in order to fully explore whether this is behind the reported relationship.

Conclusion

The current literature has so far failed to address whether the common practice of dealing with e-mails on smartphones outside of work is associated with coping and overload. The conclusions of the present study indicate that while smartphone ownership is associated with lower overload, neither overload nor coping are related to the volume of e-mails or the time spent processing them outside of work. This therefore indicates that it is not the ability to deal with

e-mails during this time that underlies the relationship between overload and smartphone use. Rather, it could be simply due to being able to access them easily, and exert a sense of control over workload as a result, or due to the other benefits of owning smartphones. For instance, smartphones allow unrivalled opportunities for social interaction, through direct phone calls, text messaging or other mediums like social networking, as well as work related applications, such as Microsoft Office or Dropbox. As a consequence, this may reduce overload due to heightened connectivity in general, in addition to the ability to access e-mail. This contributes to the debate surrounding the costs and benefits of smartphone use, indicating that workers may stand to gain a sense of control of work e-mail by owning a smartphone. This has broader implications for a society in which remote working and increased connectivity are becoming the norm, with a greater than ever reliance on technology.

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