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Computers in Human Behavior xxx (2006) xxx–xxx
Computers in Human Behavior
www.elsevier.com/locate/comphumbeh

The influence of self-esteem and locus of control on perceived email-related stress

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Abstract

Electronic mail has become an indispensable tool in business and academia, and personal use is increasing every day. However, there is also evidence that Email, unlike more traditional communication media, can exert a powerful hold over its users and that many computer users experience stress as a direct result of email-related pressure. This paper develops a three-fold typology of orientations to email: 'relaxed', 'driven' and 'stressed'. It further investigates whether the personality traits of self-esteem and locus of control are associated with email-related stress. It finds that low self-esteem is associated with the 'driven' orientation. It further suggests that the 'stressed' orientation may be related to how distractive email is perceived to be, compared with other forms of communication.

Keywords: Email; Computer-mediated interaction; Stress; Self-esteem; Locus of control; Factor analysis

1. Introduction

Email is used in many different settings, ranging from the original academic environment, to the home handyman communicating with his clients. Email is much more than a mere electronification of the traditional mailed letter. Firstly, it is much faster – speeding

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0747-5632/$ - see front matter
doi:10.1016/j.chb.2006.05.005

up communication from days to minutes. Secondly, it arrives continuously, as it is sent, if the email user is online all the time – as many are these days with an increasing use of broadband and office networks. This means that the email user can potentially be dealing with email on a more or less constant basis, and indeed there is strong evidence that people *are* actually behaving in this way. Czerwinski et al. found that users who were asked to diarise their tasks considered email to be something that had to be dealt with throughout the day (Czerwinski, Horvitz, & Wilhite, 2004).

It is therefore unsurprising that there is mounting evidence of the intrusiveness of email. In 2001, Gartner reported that 42% of users were checking email on vacation and 23% were checking it at weekends (Westling, 2001). In 2004, Drakos and Gray at Gartner were raising concerns that excessive dependence on e-mail was threatening the maintenance of valuable organisational knowledge (Drakos and Gray, 2004). In 2005, AOL's survey of more than 4000 people found that 25% could not go without email for more than three days, 41% checked email first thing in the morning, 60% checked email on vacation, 47% checked personal email at work, and 77% had more than one account. They referred to "*an obsessive-compulsive need to check it morning, noon and night*".

Although this personal email "addiction" is somewhat perturbing, the situation at work appears to be even more frenetic. Jackson et al. (2001) observed a group of employees' email behaviour and found that it took them an average of 1 min 44 sec to respond to emails – with 70% of users reacting within 6 s Jackson et al. (2001). The workers usually took an average of 64 s to return to their work. Czerwinski et al.'s study found that employees reported spending 23% of their time dealing with email. Surprisingly, when they were asked to identify the causes for switching to email only 3% were attributed to the email reminder facility but an incredible 40% of interruptions were self-generated.

Markus confirms this, finding that email recipients tend to answer messages *as they arrive* (Markus, 1994) which means that they are treating it in the same way as they would a telephone call. It would appear that people are voluntarily and regularly switching to email from other applications and checking it throughout their working day. One possible reason for this is that workers tend to have multiple tasks active at any one time and switch between them constantly (González & Mark, 2004). Bellotti et al. found that the workers they studied managed an average of 65 concurrent active tasks (Bellotti, Ducheaneat, Howard, Smith, & Grinter, 2005) and González and Mark observed users working on an average of 10 working spheres *per day*. González and Mark argue that it is not only the activity of dealing with the interruptions, such as reading email, that takes its toll on workers, but also the switching activity itself since there is a need to change mental context with every activity switch. They find that workers tend to spend an average of only 3 min working on any one activity before switching to another.

Whilst this continuous switching would appear to be beneficial in terms of being able to manage multiple activities, thereby increasing productivity, the flip-side of this is that the increased pace of work can have negative health effects (Levine, Lynch, Miyake, & Lucia, 1989). There is much evidence that increased pace is linked to stress (Arndt, 1987; Houtman, Bongers, Smulders, & Kompie, 1994; Steptoe, Fieldman, Evans, & Perry, 1993), and that employee stress, by being a factor in causing ill-health, can cause problems for the organisation (Calabrese, Kling, & Gold, 1987). In the case of email, the evidence appears to suggest that this stress is self-imposed. Hence it would appear that the employees' behaviour is caused by their perceptions, which drive them to monitor and deal with incoming emails continuously.

While there is much general evidence of the potential for email to lead to stress there has been little attempt to consider what factors are important in determining email handling behaviour. Some attempts have been made to classify email users in terms of:

- *Organising tendencies*: Gwizdka classifies emailers simply as either keepers or cleaners (Gwizdka, 2004)
- *Email Message Semantics*: (Cohen, Carvalho, & Mitchell, 2004) classifies email in terms of purpose – with categories such as request, deliver, commit, propose, remind, amend, refuse and greet.
- *Email Message Syntax and Semantics*: An AOL survey of 3000 computer-users identified six types of "emailers" based on the format of message they were in the habit of sending (Woffenden, 2004). They were classified into:
  (a) The Cryptic – messages are full of acronyms and abbreviations
  (b) The Author – uses dense multi-syllable prose
  (c) The Forwarder – emails every joke and chain letter
  (d) The Player – blames server problems for emails he received but did not deal with
  (e) The Smiley – decorates emails with cartoon smileys such as: (–)

However none of these categorisations help in understanding what drives some people to be so obsessive about email. In this paper an attempt is made to address this and to derive a typology of orientations or predispositions towards email.

This paper also examines some personality factors that may help explain the obsessive tendencies of emailing behaviour in some users. In the next section we will consider the evidence from the literature of the relationship between personality and email stress.

2. Personality and email stress

Stress is a multi-faceted problem, caused by many factors operating both individually and in parallel. The literature identifies a number of factors relevant to this discussion: resource inadequacy (Gupta & Beehr, 1979), control over daily working hours and effort-reward imbalance (Ala-Mursula, Vahtera, Linna, Pentti, & Kivimaki, 2005) and quantitative workload and interpersonal conflict (Spector & Jex, 1998). It is clear that both organisational and personality factors are likely to play a part in determining the relationship between email usage and stress. This paper focuses on individual differences to see if these can shed light on differing perceptions of the pressure to constantly monitor and respond that has been observed in many email users.

There has been little work that has focused specifically on personality and email usage. However, some research has focused on the relationship between individual differences and general web usage. The US based HomeNet project (Kraut, Lundmark, Kiesler, & Scherlis, 1997) examined the behaviour patterns of individuals during their initial years as internet users. It was found that the greater the internet use, the less likely people were to maintain existing friendships — this despite person-to-person communication being one of the most commonly cited reasons for going online. Carducci and Zimbardo (1995) suggested that mediated communications media attract shyer individuals as a function of the increased sense of control held over mediated communications. Chak and Leung (2004) found that shyness and a person's likelihood of being addicted to using the internet were

indeed correlated. However, Tuten and Bosnjak (2001) found that introversion was *not* associated with any form of web usage. They did, however, find that 'need for cognition' (Cacioppo, Petty, & Kao, 1984; Cacioppo, Petty, Feinstein, & Jarvis, 1996) was significantly related to use of the web for information, learning and education. Marcus and Schultz (2005) report that respondents to internet surveys were more agreeable and more open to experience, but they did not appear to be more conscientious.

Two specific personality traits that have been shown to be related to occupational stress, are locus of control (Hendrix, 1989; Parkes, 1991; Spector, 1987) and self-esteem (Rosenberg, 1965). These would seem to be good candidates to be linked with perceptions of email-related stress. Firstly, individuals with an external rather than an internal locus of control of reinforcement find it harder to ignore extraneous noise, stimuli or other distractions when working and feel less in control of their accessibility to others (Corno, 1993). These individuals, when faced with constant email interruptions, may well experience feelings of stress. Secondly individuals with higher self-esteem feel significantly more in control of their working environment and thus would be less susceptible to a feeling of stress from incoming emails (Rosenberg, 1965, 1979).

While there would seem to be an a priori case for the importance of both self-esteem and locus of control in mediating email behaviour, there is conflicting evidence in the existing literature. (Armstrong, Phillips, & Saling, 2000) found that people with poorer self-esteem exhibited more internet-related problems such as addictive behaviour. Funk and Buchman (1996) found that electronic game playing was associated with lower self-esteem among females. However, Rohall, Cotton, and Morgan (2002) found that while use of the internet for non-communicative reasons was related to low self-esteem, use of e-mail and instant messaging was not significantly associated with self-esteem. Minsky and Marin (1999) studied academic use of email in order to investigate why, in the same circumstances, one person might use email frequently while another used it infrequently, or not at all. They found that people who perceived email as beneficial and easy to learn, or use, were more likely to use email. A favourable orientation toward change and innovation and high computer self-efficacy were also positively associated with email use. However, they reported that locus of control was *not* related to frequency of email use.

3. Hypotheses

In this paper four hypotheses are proposed:

1. Individuals with high self-esteem will differ in perceptions of email stress as compared to individuals with low self-esteem. Specifically this is mediated through perceptions of control over the working environment. Hence there are two hypotheses:
   - Self-esteem is positively related to perceptions of control over work environment so that *low* self-esteem is associated with *lack* of control over work environment.
   - Perceptions of control over the work environment will be negatively related to perceptions of email stress so that *lack* of control over the work environment is associated with *greater* email stress.
2. Individuals with external loci of control of reinforcement will differ in their perceptions of email stress when compared to individuals with internal loci of control of reinforcement. Specifically this is mediated through the ability to deal with distractions. Hence there are two hypotheses:

- External locus of control will be negatively related to the ability to deal with distractions so that an *external* locus of control is associated with *difficulty* in managing distractions.
- The ability to deal with distractions will be negatively related to perceptions of email stress so that *difficulty* in managing distractions is associated with *greater* email stress.

4. Method

A worldwide web-based survey of the ways in which individuals deal with their email was conducted. The survey elicited "self-report" email-related behaviours, which are reported elsewhere (Renaud, Ramsay, & Hair, 2006). Additionally, individual differences were explored with respect to the way(s) in which email interruptions are subjectively viewed. The survey asked about the various activities for which email is used, frequency of usage, control of email, the interweaving of work and personal email communications and recipient perception.

The web-based survey was launched in December 2004. Fifty academics took part in the online survey which was hosted at the University of Glasgow. Following a pilot study, the questionnaire was developed and relaunched in March 2005. The main survey encompassed not only UK academics, but individuals from academic and non-academic professions globally. The questionnaire was advertised via colleagues and contacts and was also listed on Chi-web, a worldwide forum for human-computer interaction-related debate. 177 individuals completed the questionnaire. When the survey was closed, a £20 Amazon gift voucher was awarded to a randomly chosen participant.

The majority of the sample (deliberately) comprised individuals in academic/creative roles. The potential of email to disrupt can be very costly in an academic context, where sustained periods of reflection and concentration are required. This similarly applies to the creative occupations such as software developers, architects, designers and consultants.

Although two thirds of the sample was female, a more even distribution of participants over the respective age groups was obtained.

5. Measures

Locus of control was measured using Rotter's (1966) locus of control of reinforcement scale. This scale consists of 16 items, each of which consisted of a pair of statements that respondents were asked to choose between. Unfortunately in this survey there was quite a high incidence of item non-response for this scale. Imputation was used to generate overall scores if respondents answered more than half the items in the scale but this resulted in a smaller sample size for this scale. Self-esteem was measured using Rosenberg's (1965) four item self-esteem scale.

Both scales have been well validated, and developed in the literature (Marsh & Richards, 1986, 1987; Robins, Hendin, & Trzesniewski, 2001). In the survey both scales were shown to have good reliability (Cronbach's alpha = 0.875 for self-esteem scale and 0.713 for locus of control).

6. Results

6.1. Predispositions to email

Respondents were asked to rate their agreement on a five-point scale to ten statements relating to email usage. An exploratory factor analysis of the responses found that there were three dimensions underlying predispositions to email. The Kaiser–Meyer–Olkin (Kaiser, 1974) measure of sampling adequacy gave a score of 0.617 which indicates that despite the relatively small sample size ($n = 156$) the factor analysis is reliable. The three factors extracted account for 64.3% of the variance. Table 1 shows the factor loadings (only those above 0.5 are shown following Stevens (1992) recommendations for significant loadings).

The first factor, which we have termed 'relaxed', has high loadings on statements that indicate that respondents see email essentially as an asynchronous communication medium rather like a speedier postal service. They feel no pressure to respond immediately to emails nor do they expect quick responses to their own emails. They have a relatively relaxed predisposition to email.

The other two factors indicate respondents feel some pressure regarding email – they see it more as a synchronous communication medium. However the two factors differ in how they react to the pressure. The second factor, which we have termed 'driven' has high loadings that indicate respondents perceive this pressure positively, they respond to emails quickly but equally expect instant responses to their emails and crucially like to deal with emails in this way.

Finally the third factor, which we have termed 'stressed' has high loadings on statements that indicate that the respondent perceives the pressure negatively, seeing email as a source of stress.

6.2. Gender and age

There are no significant gender differences in the three underlying orientations to email outlined above; males and females are equally likely to score highly on each factor. There are also no age differences with the exception that those under 40 tend to score more highly on the 'relaxed' factor ($t = 2.074$, $\mathrm{df} = 146$, $p = 0.04$).

Table 1
Factor loadings for email usage

Statement related to email usage	Loadings		
	Relaxed	Driven	Stressed
I expect a reply to emails within a week	.848		
People expect a reply to emails within a week	.811		
I expect a reply to emails within a few days	.801		
People expect a reply to emails within a few days	.750		
People expect instant replies to emails		.741	
I expect instant replies to my emails		.700	
I feel pressure to deal with my email		.610	
I like to deal with emails as soon as possible		.597	
Email is a source of stress for me			.790
Email makes my life easier			−.705

Extraction method: principal component analysis.

6.3. Frequency of email use

The three underlying factors were not related to frequency of email use. Respondents were asked how frequently they actively checked their emails. Fig. 1 shows the reported frequencies. 64.3% reported that they checked emails more than once an hour while 34.3% checked every 15 min or less. There was no correlation between any of the factors and frequency of checking ($r = -.02$ for 'relaxed' and 'driven' and .04 for 'stressed', $n = 137$).

However, as previous research has noted (Renaud et al., 2006), self-reported data on frequency of usage may not be reliable, since people may actually check emails far more often than they realise. Furthermore, it may be that predispositions towards email may be associated less with the activity of checking itself and more with the perception of need to respond.

6.4. Predispositions to email, self-esteem and perceptions of control

It was hypothesised that self-esteem would be positively related to perceptions of control over the working environment. Respondents were asked to rate their perceptions of control over their general accessibility to others. As shown in Table 2 there was a positive relationship between this and self-esteem ($r = .225$, $p = 0.009$, $n = 133$). Respondents were also asked specifically about their control over email. There was a smaller but still significant positive relationship with self-esteem ($r = .190$, $p = 0.028$, $n = 133$).

It was further hypothesised that perceptions of control over the working environment would be negatively related to email stress. There was a clear significant negative correlation between the perception of general accessibility with the 'stressed' factor ($r = -.268$, $p < 0.001$) but a significant positive relationship with 'driven' factor ($r = .163$, $p = 0.042$). There was also a significant negative correlation between perception of control over email and the 'stressed' factor. ($r = -.322$, $p < 0.001$) but no correlation with 'driven' factor. Hence an underlying 'stressed' orientation to email is related to a feeling of not being in control.

There were also significant negative correlations between self-esteem and both the 'driven' ($r = -.217$, $p = 0.012$) and 'stress' factors ($r = -.192$, $p = 0.027$). However, when both control of general accessibility and control of email were controlled for self-esteem was only negatively correlated with the 'driven' factor ($r = -.248$, $p = 0.004$). Those with

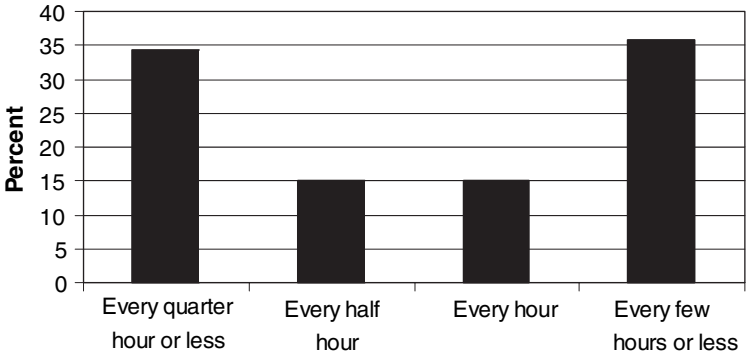

Fig. 1. Frequency of checking email.

Table 2
Predispositions to email, self-esteem and perceptions of control

Perceptions of control	Self-esteem	Predisposition to email		
		Relaxed	Driven	Stressed
To what extent do you feel that you are in control of your general accessibility to others ($N = 156$)	.225**	−.062	.163*	-.268**
To what extent do you feel that you are in control of your email ($N = 156$)	.190*	.027	−.004	−.322**
Self-esteem score ($N = 133$)		−.029	−.217*	−.192*
Partial correlations when 'perceptions of control' partialled out ($N = 129$)		−.017	−.248**	−.137

* Correlation is significant at the 0.05 level (1-tailed).
** Correlation is significant at the 0.01 level (1-tailed).

low self-esteem felt more pressure to respond promptly to emails. While self-esteem is a factor in explaining propensity to feel 'driven' by email it does not adequately explain the 'stressed' factor.

6.5. Predispositions to email, locus of control and ability to deal with distractions

It was hypothesised that those with an external locus of control would find it more difficult to ignore distractions and, as Table 3 shows, there was indeed a significant negative relationship between external locus of control and the ability to ignore general distractions ($r = -.209$, $p = 0.017$). There was also a negative but not significant relationship with resuming work after attending to an email ($r = -.162$, $p = 0.10$).

It was further hypothesised that the ability to deal with distractions will be negatively related to perceptions of email stress There was a significant negative correlation between the ability to ignore general external distractions and the 'stressed' factor ($r = -.376$, $p < 0.001$). There was also a significant negative relationship between respondents ability to resume work after attending to an email and the 'stressed' factor ($r = -.242$, $p = 0.002$). There was no significant relationship between ability to deal with distractions and either of the other two factors 'relaxed' and 'driven'.

However, locus of control is not significantly related to any of the three orientation factors. Even when ability to deal with distractions was controlled for, there was still no sig-

Table 3
Predispositions to email, locus of control and ability to deal with distractions

Ability to deal with distractions	Locus of control	Predisposition to email		
		Relaxed	Driven	Stressed
Please rate your general ability to ignore extraneous noise, stimuli or other distractions when you are working ($N = 104$)	−0.209*	−.133	.010	−.376**
How would you rate your ability to resume your ongoing work after attending to an email alert ($N = 104$)	−0.162	−.116	−.086	−.242**
Locus of control score ($N = 102$)		−0.111	0.115	−.0.089
Partial correlations when 'ability to deal with distractions' is partialled out ($N = 100$)		−0.132	0.105	−0.002

* Correlation is significant at the 0.05 level (1-tailed).
** Correlation is significant at the 0.01 level (1-tailed).

Table 4
Predispositions to email and potential distractions

Potential for distraction ($N = 156$)	Predisposition to email		
	Relaxed	Driven	Stressed
Colleague talking in background	−.010	.002	.177*
Telephone call for you	.164*	.183*	.052
Email arriving for you	.247**	.084	.232(**)
Text message arriving for you	.121	.186*	−.115
Instant messaging message	.206**	.056	.003
Unannounced visit	.181*	.235**	−.054
General noise in the background	−.161*	.078	.202*

* Correlation is significant at the 0.05 level (1-tailed).
** Correlation is significant at the 0.01 level (1-tailed).

nificant relationship. While locus of control is related to the ability to deal with distractions it does not seem to have a bearing on orientations towards email. This unexpected result may be related to concerns regarding validity of the scale given the large amount of missing data and the need for imputation as discussed earlier.

6.6. Types of distraction

Respondents were asked to rate a number of events for their ability to disturb their work. The relationship between the potential for disruption and the orientation to email factors identified previously is shown in Table 4.

Significant positive correlations were found between the 'stressed' factor and the ability to be distracted by colleagues talking in the background and general background noise (both related to general ability to ignore disruptions) and specifically by email arriving. Interestingly, the 'relaxed' factor was also found to be significantly correlated with the ability of email to distract. In this case however there were also significant positive correlations with the ability of telephone calls, instant messaging, and unannounced visits to distract. Email was not particularly singled out as a disruptive factor indicating, perhaps, that it was better managed.

By contrast, the 'driven' factor was positively related to distractions by telephone, by text message and by unannounced visit but not by email or by general background noise. Hence a propensity to view email pressure as positive may be related to its place in the pecking order of interruptions. If email is perceived as less disruptive than other potential interruptions then it may be viewed more positively.

7. Discussion

While many authors talk of email stress, it is by no means clear what this means and no scale has yet been devised to measure it. This research has put forward a tentative scale that identifies three types of underlying orientation to email.

1. *Relaxed:* email exerts no undue pressure. Those for whom this is the dominant orientation deal with the emails as and when they see fit and refuse to allow anyone to exert long-distance pressure on them. Email is experienced as an asynchronous communication medium.

2. *Driven:* email exerts pressure. Those for whom this orientation is dominant feel the need to reply instantaneously to emails and expect the same in return. Email is experienced as a synchronous communication medium.
3. *Stressed:* email exerts stress. Those for whom this orientation is dominant do not find email a useful medium, the pressure to respond is experienced as a negative factor.

The typology developed would seem to be directional, one could imagine that the 'driven' orientation is a necessary but not sufficient pre-requisite for the 'stressed' orientation and it would be interesting to discover what could tip an individual from one to the other.

As well as developing this typology of orientations this paper also considered some of the personality effects that may be associated with these orientations. It was hypothesised that a lack of self-esteem would be related to a perceived lack of control over the working environment which would further be related to perceptions of email stress. These hypotheses were partly substantiated. Low self-esteem was found to be related to lack of control and lack of control was found to be related to both the driven and the stressed orientations. However, low self-esteem, on its own, seemed only to explain the driven orientation. The fact that the 'stressed' factor was correlated with the lack of control but not with self-esteem once control was partialled out indicates that there are other factors affecting perceptions of control other than self-esteem. While these could be other personality traits they are more likely to be situational factors, for example the level of seniority in the organisation.

It was also hypothesised that an external locus of control would be related to a poor ability to deal with distractions and that this would be further related to perceptions of email stress. Once again these hypotheses are partly substantiated. An external locus of control was found to be related to the general ability to ignore distractions and lack of ability to deal with distractions was found to be related to the stressed orientation. However external locus of control was not found to be significantly related to any underlying orientation to email. Once again other factors appear to affecting the ability to deal with distractions.

Of the two personality traits examined, self-esteem seems more promising than locus of control as an email pressure vector. However, while self-esteem seems to be related to a 'driven' orientation towards email, it could not explain why users developed a 'stressed', orientation to email. Moreover none of the significant correlations were very high, mostly in the range of .2 to .3 giving medium effect sizes at best.

The best differentiators between the 'driven' and the 'stressed' orientations were found to be related to the general ability to deal with distractions and to the comparative potential for distraction presented by email. Those who saw email as a less intrusive form of distraction were less likely to be stressed by email. It would be instructive to understand what determines this perception. It may be related to situational factors or to other personality factors that we did not consider, for example introversion. The work of Chak and Leung (2004) cited earlier has a resonance here. It may be that introverted people feel less stressed by email as it provides a less pressured form of communication than face to face contact or telephone conversation.

There were a number of limitations in the current study that need to be addressed in future. Firstly, the sample was not broadly representative of the working population; it was comprised mainly of people working in creative occupations such as academics or designers. A future study using a broader sampling base would be required to generalise these findings.

Secondly, more work is needed to develop and refine the scale to measure orientations towards email. The factors found in this study would also need to be tested using confirmatory factor analysis.

Thirdly, more attention should be given to situational factors. There may be aspects of the working environment that are important in relation to orientations towards email, for example the nature of the work, the level of seniority in the organisation, volume of emails and where they originate may all be of importance.

The antecedents of orientations towards email are complex and are likely to be related to an interaction between both individual differences and to situational factors. Nevertheless this research has shown that a wider study that incorporated both personality and working environment variables may well be productive in explaining the seemingly obsessive-compulsion to check email evidenced in some users.

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