Available online at www.sciencedirect.com
ScienceDirect
Computers in Human Behavior 23 (2007) 1820–1837
Computers in Human Behavior
www.elsevier.com/locate/comphumbeh

Describing the strategies used for dealing with email interruptions according to different situational parameters

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Available online 19 January 2006

Abstract

Interruptions research is heavily reliant on a paradigm involving 'enforced interruption'. Email use however constitutes a special form of 'controlled interruption'. As there is no precedent available in the existing literature to describe what strategies people use to deal with 'controlled interruption', an exploratory first study was undertaken using an open-ended interview design. Twenty-eight email users working within UK organisations were asked about how they dealt with email interruptions, when faced with different situational or task parameters. Qualitative content analysis of interview transcripts revealed a wide range of strategies used for dealing with email *in general*, and for specific situations in particular, with idiosyncratic differences in application. These findings are consistent with the predictions of Action Regulation Theory [Hacker, W. (1985). Activity: A fruitful concept in industrial psychology. In M. Frese, J. Sabini (Eds.), Goal directed behaviour: The concept of action in psychology. London, Lawrence Erlbaum Associates (Chapter 18); The German Journal of Psychology 18(2) (1994) 91–120] – that people select strategies (action programs) for achieving a task according to the specific parameters of the task or goal. However, the findings go further in highlighting the salience of individual differences in underwriting one's choice of strategy (or action program). Further research is required to understand which strategies are linked to effective performance, and how individual differences influence strategic decision making in multi-goal work environments.
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Keywords: Interruptions; Email; Strategies; Goals; Control; Action Regulation Theory

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doi:10.1016/j.chb.2005.11.002

1. Introduction

Interruptions are considered to be, "...externally generated, temporary cessation[s] in the current flow of behaviour, typically meant for the subject to execute activities that belong to a secondary set of actions." (van den Berg, Roe, Zijlstra, & Krediet, 1996, p. 236). Interruptions then are events that divert an individual's attention away from a task or process in order to engage with another activity. In principle, the individual has no control over an interruption since it is triggered by something or someone external to the individual's cognitive world.

There are two approaches to studying interruptions. One approach is top-down and theory-driven, starting with an interest in cognitive processing and using interruptions as a tool for exploring the processes an individual is engaged in at the point when they are interrupted (Eyrolle & Cellier, 2000; Gillie & Broadbent, 1989; Roe et al., 1995; Zijlstra, Roe, Leonova, & Krediet, 1999). The other approach is bottom-up and practice-driven. This approach starts with interruptions as the point of interest, with experiments designed to establish what effect interruptions in the workplace and daily life have on ability to achieve one's goals (Cutrell, Czerwinski, & Horvitz, 2001; Czerwinski, Cutrell, & Horvitz, 2000b; Einstein, McDaniel, Williford, Pagan, & Dismukes, 2003; McFarlane, 2002; Trafton, Altmann, Brock, & Mintz, 2003). The approach adopted here is a hybrid of the two. The current study begins with an interest in looking at how email interruption (which, as opposed to laboratory based 'enforced interruption', can be controlled by the recipient) impacts on goal directed behaviour in an ecologically complex multi-goal environment. This primary focus is nonetheless inextricably linked with a theoretical interest in the cognitive-motivational processes involved in dealing with naturally occurring 'controlled' interruptions induced by email, for which there is currently no precedent in the literature.

A strategy is a goal-specific cognitive plan or program. Goals are interdependent on each other, so using one strategy necessitates that other goals may be inhibited or facilitated (Dewe, 2003; Hockey, 1997, 2000, 2002). As there is a dearth of empirical evidence describing what strategies people use when an email interruption intrudes upon their work activity, it was decided that an exploratory interview study should be set up to examine: (i) firstly, what strategies people attempt to use when dealing with email in general, and (ii) secondly, to establish which strategies are applied to deal with email interruptions when situational parameters change. Action Regulation Theory (Hacker, 1985, 1994) states that individuals engaged in goal-directed work activity use action programs, or strategies, that have previously proved to be successful in achieving similar tasks. By assessing the conditions required to execute a strategy before and throughout undertaking an activity, individuals at work are able to retrieve the most appropriate plan for the circumstances (Frese & Zapf, 1994). As parameters of the situation change, or differ to those stored with the executed plan, the individual at work will adapt their strategy, to ensure that it is the most efficient one available for dealing with each situation. Accordingly, it is expected that when one's work situation changes, the strategies that one uses to deal with an email interruption, will also change. A range of situational or task parameters were thus highlighted as potentially relevant, because they have previously been found to affect one's strategic adaptation to interruptions or to other work demands. These parameters are *task difficulty or importance* (Cutrell et al., 2001; Zijlstra et al., 1999), *workload implications* (Woods & Patterson, 2001), *task deadlines* (Freedman & Edwards, 1988; Seshadri & Shapira,

2001), *and task boredom* (Fisher, 1998). However, it must be noted that because these variables have not been studied within the context of controllable email interruptions they invite research attention from this perspective. A final parameter of *email relevance* was also included on the assumption that not all interruptions are necessarily in conflict with a current task, and in fact that some interruptions may convey information that aids completion of the current task more effectively (see van Solingen, Berghout, & van Latum, 1998, for example). To ensure that strategies identified are 'real' strategies used by people in their normal day-to-day work (i.e. have ecological validity), the current study was executed with authentic computer-based workers who deal with email interruptions on a daily basis.

2. Method

Semi-structured, open interviews, lasting for up to one and a half hours each, were used for this exploratory study. Only relevant questions will be dealt with here; readers may note 'gaps' in reported question sequences where non-relevant questions have been omitted from this analysis. The first set of questions covered here asked about people's typical email use. In the next set of questions, participants were asked to outline all of the different strategies they could think of that they use when dealing with email, ordinarily. Finally, participants were then asked to comment on the strategies used to deal with email as the parameters of the situation (as discussed above) changed. Section 3 deals with these question sets according to this order.

2.1. Sample

In total, 28 participants from three participating organisations agreed to take part in the exploratory interviews, having been informed of the project rationale, logistics and issues of confidentiality. Eleven participants were recruited from organisation *X* (an international development charity), 10 from organisation *Y* (an armed forces consultancy), and six from organisation *Z* (a multi-national blue-chip). One candidate volunteered from a fourth organisation (referred to as organisation Zb).

Of the respondents, six worked at an administrative job level (two of whom were part-time), six worked at a senior administration or junior managerial level, 10 worked at a middle or project management level, and six worked at a professional or senior managerial level. Ten participants were men. Eleven participants were in the age range from 21–30 years, eight were in age range 31–40 years, four were in age range 41–50 years, four were in age range 51–60 years, and one was aged over 61 years. The majority of participants (17 out of 28) had been using email at work for between 4 and 7 years. Just two people had been using email at work for 3 years or less, with six people using email at work for 12–15 years, and three people using it for 16 years or more. Finally, 26 of the 28 participants used Microsoft Outlook as their email operating system, with just 2 participants using Lotus Notes.

2.2. Equipment, environment and materials

The interviews were held on the premises of each organisation, within suitable private interview rooms or offices (specified to be quiet, airy, light and comfortable, with adequate

space). Aside from the interview guide, the usual transcription materials were used (pen and paper, a transcribing machine, blank audio-cassettes and spare batteries).

2.3. Procedure

At least one week before their interview, each participant was sent a letter thanking them for their interest in the research and clarifying the date, time and location of the interviews. Issues of confidentiality and feedback were covered in the letter and contact details of the researcher were provided. Participants were also asked to try and think about their use of email before attending the interview, in particular focusing on how many emails they send and receive in an average day, and what these emails are like. This was designed to focus them on the research questions and to try to avoid an over-reliance on memory during the interview proper.

On interviewing each participant, the interviewer ensured the participant was informed and comfortable, and then the standardised instructions were administered. Any questions were dealt with before consent was sought to tape record the interview (all participants obliged). The interview proper, based on the interview guide (contact the author for a copy, although note not all questions are relevant to this paper), then began. Probes, prompts and clarifications were included as necessary, in order to ensure that the interviewee was fully congruous with the question semantics. Once the interview proper was over, the interviewee was invited to discuss any related topic that he/she felt had not been covered. The participant was then thanked and debriefed and the session drew to a close.

2.4. Transcribing and coding the interviews

The content analysis approach was used to analyse the findings of these preliminary interviews. Content analysis is considered to be a useful way of gathering quantifiable information from a qualitative data collection method. It thus appears to address the needs outlined by Sonnetag (2000) that qualitative research should be analysed using quantitative methods wherever possible. For an explanation of the rules applied to the content analysis of the interview transcripts please contact the authors.

Having transcribed and coded the interviews, results were entered into a spreadsheet. Essentially, if a participant gave an answer that related to a particular code, a '1' was noted in the appropriate case-by-code cell. If a participant did not give an answer relating to a particular code the case-by-code cell was left blank. This meant that for each question, the number of participants that reported each possible answer could be summed. This gave a frequency of reports per code. Percentages were calculated to ascertain what proportion of participants reported each answer. Because there were several answers (and, therefore, codes) available for each question, and because these answers (or codes) are not mutually exclusive (i.e. participants gave as many answers per question as they liked), frequencies and percentages calculated could only summarise *which answers had been reported with greatest frequency*. So, to say that 35% of participants positively reported answer 5.2 does not mean that 65% of remaining participants positively reported a different answer to question 5.

The coding categories reported for each of the relevant questions covered here are summarised in Table 1.

Table 1
Coding results and frequency percentages from interview transcript Content Analysis

Question	Code description	Code reference	Percentage reported (integers)
1. No. of email sent per day	1–10	1.1	14
	11–30	1.2	54
	31–50	1.3	32
	51–70	1.4	0
	71–90	1.5	0
	91+	1.6	0
2. No. of email received per day	1–10	2.1	11
	11–30	2.2	54
	31–50	2.3	29
	51–70	2.4	4
	71–90	2.5	0
	91+	2.6	4
3. Type of email sent	Replies	3.1	39
	Job/project related	3.2	64
	Action	3.3	29
	Information	3.4	57
	Personal and social	3.5	68
	Queries and enquiries	3.6	46
	Back-up	3.7	46
	Quick/immediate responses and notes	3.8	29
	Forwarding misdirected	3.9	11
4. Type of email received	Junk distribution	4.1	18
	Impersonal relevant	4.2	64
	Acknowledgements and receipts	4.3	7
	Meeting related	4.4	18
	Job/project related	4.5	79
	Queries and enquiries	4.6	61
	Misdirected	4.7	11
	Personal and social	4.8	64
	Quick/immediate responses and notes	4.9	21
9. How do you know when you have new, incoming email?	Audible alert	9.1	79
	Icon appears	9.2	57
	Cursor changes	9.3	4
	Message box appears	9.4	18
	Sees email arrive in inbox	9.5	14
9A. Does this suit you?	Yes	9.6	85
	No	9.7	7
	Has deliberately set this up	9.8	33
9B. How often do you check your inbox?	Always on-line (continuously/checks on alert)	9.9	64
	Infrequently (e.g. every 1–2 h)	9.10	14
	Frequently (e.g. every 10–15 min)	9.11	25
9C. Do you respond immediately?	Previews email immediately	9.12	29
	Reads *and* responds on cue/immediately	9.13	21
	Opens and reads on cue/immediately	9.14	11
	Response depends on email	9.15	29

Table 1 (*continued*)

Question	Code description	Code reference	Percentage reported (integers)
	Response depends on current task	9.16	46
	No – won't check until set time	9.17	7
12. What strategies do you use to deal with email?	Preview on cue/immediately but respond depending on task	12.1	36
	Allocate diary time to deal with email	12.3	18
	Storage in folders and sub-folders in system	12.4	86
	Monitors inbox size	12.5	29
	Uses standardised templates and language	12.6	11
	Hoards emails (rarely deletes)	12.7	14
	Uses signature	12.8	11
	Uses informal style	12.9	4
	Provides alternative contact details	12.10	7
	No firm strategies	12.11	7
	Keeps inbox clear	12.12	11
	Prints emails (to action/file)	12.13	18
	Storage in folders and sub-folders outside system	12.14	25
	Uses 'priority' appropriately	12.15	4
	Uses 'to' line sparingly, 'cc' non-actionees	12.16	4
	Tracks receipts and actioning of email	12.17	11
	Live inbox until issues closed (for access anywhere)	12.18	25
	Flag/mark/code email to follow up	12.19	21
	Sends shortcut links, not attachments	12.20	4
	Provides action deadlines for response	12.21	7
	Absence contingencies (out-of-office or redirection)	12.22	18
	Avoids use of preview screen	12.23	7
	Uses draft email	12.24	4
	On reading – clears to folders or bin	12.25	50
	Prioritisation of email actions	12.26	36
	Deals with in order of receipt (non-prioritisation)	12.27	7
	Fosters all business communication via email	12.28	4
	Emails unsolicited senders to remove from list	12.29	4
	Sets own time limit by which to respond	12.30	4
	Conducts periodic housekeeping	12.31	32
	Keeps email short	12.32	7
	Always checks before sending	12.33	7
	Deals with according to tiredness	12.34	4
	Avoids immediate/cued checking	12.35	4
	Uses integrated system tools (calendars/tasks)	12.36	21
	Forward or cc when email of interest to others	12.37	4
	Delete unrecognisable subject or sender (without opening)	12.38	18
13. How do your strategies change when you are under a deadline?	Checks inbox but may not deal with it	13.1	43
	Deletes or ignores irrelevant/unimportant email	13.2	7
	No change	13.3	18
	Use out-of-office to warn of delay	13.4	4
	Checks email priority against task and responds accordingly	13.5	32
	Ignores email completely	13.6	32
	Informs recipient of need for timely response	13.7	7

(*continued on next page*)

Table 1 (*continued*)

Question	Code description	Code reference	Percentage reported (integers)
14. How do your strategies change when you are working on important or difficult tasks?	Ignores email completely	14.1	56
	No change	14.2	22
	Responds with brevity	14.3	7
	Leaves housekeeping	14.4	7
	Appreciates distraction – reads and responds	14.5	11
	Checks inbox but may not deal with it	14.6	33
	Checks email priority against task and responds accordingly	14.7	15
15. How do your strategies change when you are working on boring tasks?	Read and respond on cue/immediately	15.1	46
	Dragging out	15.2	7
	Ignore then apologise later	15.3	4
	Check more frequently	15.4	25
	No change	15.5	29
	More housekeeping	15.6	29
17. How do your strategies change when email is central to your work task?	Check immediately against task and priority responding	17.1	54
	Keeps inbox on screen	17.2	7
	Email isn't central to completing tasks	17.3	4
	Organise email rules to only show relevant files and emails	17.4	7
	No change	17.5	18
	Danger of distraction due to increased checks	17.6	7
	Responds to all, even to warn of delay	17.7	4
	More stringent enforcement of strategies	17.8	11
	Print off to check details	17.9	4
	Encourages timely response in sending	17.10	14
	Checks even without cue	17.11	4
18. Do you ever feel overloaded by email?	Yes	18.1	68
	No	18.2	32
19. If yes, why/when?	Overload backlog in absence	19.1	68
	All the time	19.2	5
	Physical presence in inbox	19.3	37
	Busy/pressured and emails keep coming in	19.4	16
	Feels others' expectation to respond quickly	19.5	16
	When email is creating unanticipated work	19.6	11
20. If yes, how do you relieve the sense of load?	Stays late	20.1	16
	Prior warning of absence	20.2	11
	Organises system to file incoming email	20.3	5
	Creates prioritisation system	20.4	58
	Makes a to-do list	20.5	11
	Deletes general/irrelevant email without reading	20.6	42
	Breaks inbox into manageable chunks (deals with a chunk each day until caught up)	20.7	11
	Seeks help	20.8	5
	Delegates	20.9	26
	Reviews/scans total inbox to get flavour	20.10	37
	Self re-appraisal	20.11	11

Table 1 (*continued*)

Question	Code description	Code reference	Percentage reported (integers)
21. If no, why not?	Absence contingency set-up	21.1	33
	Email holds no surprises	21.2	22
	Allocates time to deal with email	21.3	22
	Email has improved life	21.4	33
	Prioritises and controls email	21.5	33
	Emails are wanted and contain important information	21.7	22
	Low volume	21.8	22
22. If no, do you want more email?	Acceptable volume	22.1	78
	Would like more email	22.3	22
	Volume irrelevant – consequential tasks/actions matter	22.5	22

3. Results

Results from the interviews are presented in Table 1.

In Table 1, for each question, the proportion of total participants reporting each answer code, in percentage terms, is presented. Note that there is undoubtedly covariance between categories as no one code is uniquely different from the other codes,[1] and a number of participants may well have reported several answers (and therefore will have been represented several times) for each question. Descriptive statistics and individual comments made by participants are also reported. The narrative comments provided by participants in the interviews have been presented to provide useful and illuminating insights into people's reasons for using email in the way that they do.

3.1. Characteristics of email use

Dealing with questions 1, 2, 3, 4 and 9 (see Table 1) these results demonstrate how email is currently being used in the modern workplace, according to the sampled participants. Interestingly, the number of emails being sent and received per day was equitable, with 54% of participants reported to be both receiving and sending between 11 and 30 emails per day. Indeed those reporting to *receive* more than 30 email per day was only 5% higher than those reporting to *send* more than 30 emails per day. From these results one can assess that the number of emails being sent and received by participants fell roughly into the same range, when averaged out. This is a lower rate than that previously recorded in the literature (Arlridge, 2002; Kraut & Attewell, 1997; Whittaker & Sidner, 1997). The most popular form of email reported to be sent by participants was of a personal/social

[1] For example, Participant One may answer question 5 by saying that they use email because it is fast, in which case he/she would be attributed code 5.1 "Convenience". Participant Two may report that they use email because it is fast and therefore they can get documents straight out to people who are working on the other side of the world. Participant Two would therefore be attributed with the code 5.1 "Convenience" *as well as* 5.6 "Ease of dispersion". Clearly there is overlap between the two codes, but two codes need to exist to take into account the differences in what 'speed' means to different participants. This relates to the generality/specificity of coding issue.

nature (68% reported), job or project related (64% reported), or information (57% reported). Of emails received, 79% of participants reported that these were job or project related, and 64% reported them to be relevant but impersonal (e.g. circulars) or equally of a personal/social nature.

Participants were asked about their email alert systems, and 79% of participants reported that they know they have new email thanks to an audible system alert (such as a ping or beep). Fifty-seven percent of participants receive an icon (such as an envelope) on their computer screen, providing a visual cue to the presence of a new email. Other reported methods of alert included the presence of a message box (e.g. 'you have new email'), physically seeing the email arrive in an open inbox, and a change to the cursor movement. However, these methods were each reported by less than 20% of participants.

Interestingly, 85% of participants reported that the method of alert that they had on their system suited them, with 33% stating that they had actually programmed the system to report the presence of email in this way:

> I get the little envelope in the bottom right hand corner. I've turned off the noise because I don't like to be interrupted when I'm doing something. (*Participant 13, Organisation X*)

Because the system of alert suits most people, this indicates that people probably do not mind being interrupted by the audible alert (the ping) as this is the most popular alert category. However, as only 33% of people reported that they specifically set their systems up to receive email in any particular manner, it could also indicate that many people do not know that they have an option to change the alert system. On the basis of these interviews however, just 7% of participants (a total of 2 people) were unhappy with the way their new email alert was delivered:

> ...if you're in a meeting in the office and you can hear that beep, beep, beep and all those email coming through, so you think, "Oh God!" you know, you're distracted...when you actually are in a meeting and you hear the beep, beep, beep and there's a crisis going on! You know that something's going on, and you know that people are copying you and you can feel the pressure with that, and you don't know what it is about. (*Participant 16, Organisation Y*)

Whether in response to an email alert or not, it seems that a new email is picked up swiftly by the majority of participants. Sixty-four percent reported that they continually check their inbox, or at least check it immediately in response to an alert, which is not always considered to be a favourable approach:

> I've got into the culture of wanting to, to regularly look at my emails, and I wish I hadn't. I want to try and wean myself off that. (*Participant 9, Organisation X*)

Twenty-five percent of participants reported to check their inbox frequently (e.g. every 10–15 min) but not necessarily immediately as they receive an alert. Just 14% of participants reported to check their inbox infrequently (e.g. every 1–2 h), perhaps preferring to get on with their other tasks until such time as it is convenient to check.

Regardless of how quickly they check the email inbox, participants were asked how quickly they then actually *responded* to new email. Most participants (46%) reported that whether they respond to the email depends on their current task (for example, whether they have time to leave their task and respond to an email). Twenty-nine percent of participants

reported that the nature of the email itself influences whether they will respond to it straight away, and 29% of participants reported that they may *preview* the email immediately, but not necessarily respond to it immediately (often because of the reasons just stated):

> Um, I tend to have a look at the mail straight away, but not necessarily respond to it though. It's really a case of prioritising. If it's something really, really urgent that I know I can answer just like that I will go back to them. But if it's something that needs some investigation or further work on, I normally leave it. (*Participant 1, Organisation Z*).

> I'd look at the subject line. If it's something that I'm waiting for a response on then I would possibly read it there and then. If I can see immediately that it's something that can wait then I'll just read it. (*Participant 15, Organisation Z*)

It seems then that people will open the email and see what it is about, their response depending on the parameters of either the current task or email. Indeed, just 7% of participants ($N = 2$) resisted going in to open, read or respond to their new email because they had set times for such a task integrated into their working day.

3.2. Strategies for dealing with email, in general

The next set of results (question 12) looks at the strategies that participants report using in dealing with the email they send and receive at work.

In response 38 answer codes were recorded. This suggests that there is a wide range of action programs in use, and the mean number of strategies used per person was 6 (SD 2.3). With the exception of 4 or 5 categories, most categories of strategies were reported by less than 30% of participants. This indicates that people may be quite idiosyncratic in the strategies they have devised for their email use. Over 40% of participants reported that they had no idea what strategies their colleagues used to deal with email. For example, in response to a question about dealing with email overload the following participant comments,

> I don't know, because, we work very closely together but I've no idea, perhaps this is something we could talk about – how other people cope with their workloads... I often get the system's over-size limit, which is a fault of mine. So I know...where my faults are and where I could do things better.... But I haven't talked to people about how they cope with that. (*Participant 20, Organisation X*)

The most popular strategy reported by participants was to store email into folders and sub-folders within their system (as 86% purported to do):

> ...I've got folders set up on my system, for my emails, to make it easier to file them away... I've got folders by category type. (*Participant 4, Organisation Z*)

Fifty percent of participants reported that on reading or actioning an email they would clear it out from the generic inbox into the 'deleted items' folder, or to another sub-folder:

> I have very strong strategies, having dealt with too much email over the years. The first thing is – if it is something I can action immediately – action it, and then more importantly, to delete it. So if it's done it goes. I don't save it, I don't store it anywhere, it's been dealt with. (*Participant 13, Organisation X*)

These two most popular categories reveal how participants try to manage their incoming email by methods of filing, storing or deleting. Other popular strategies reported by participants include:

- Using a prioritisation system to deal with email (code 12.26 reported by 36% of participants):

  > I will read my email and decide what I need to action – what's the priority and what's not, and there are –, I can read it and then mark it as unread so I know I have to go back to it. (*Participant 21, Organisation X*)

- Previewing email on alert/immediately but responding according to task or email demands (code 12.1 reported by 36% of participants)
- Conducting periodic 'housekeeping' on the system – e.g. storage/deletion/tidying up the system – (code 12.31 reported by 32% of participants):

  > What I tend to do is, every three months, I tend to archive off the last three months worth of work. So I've always got two or three months active on my email and then I archive the previous three months off onto saved areas. (*Participant 8, Organisation Y*).

  > You can tell when I'm doing too much work because they pile up. And if they pile up and I haven't read them after a week, I figure that they're probably not worth reading and I delete them anyway [laughter] – very harsh! (*Participant 13, Organisation X*)

Summarising all of the strategies mentioned by participants into a more manageable (but less informative) four categories indicates that 10% of strategies mentioned were for 'receiving' email, 15% of strategies mentioned were for 'sending' email, 73% of strategies mentioned were for 'managing' the email system, and 1% of reports were for 'no strategies'. As noted in the figures above, it is in the management of email therefore that people have devised the most strategies.

Having established how people attempt to deal with email in general, the following Results sections identify how strategies may change when dealing with *incoming email*, as parameters of the situation change, placing more or fewer demands on people, or when email is central to the completion of a work task.

3.3. Strategies for dealing with email when demands increase

Participants were asked to think about how their strategies for dealing with email may differ when increased demands from task deadlines, important or difficult tasks, or email overload, impact upon them.

3.3.1. Task deadlines

When asked whether the strategies differed when working under a deadline (see question 13 in Table 1), strategies did seem to differ, as highlighted by the following participant:

> I definitely manage email much more efficiently when I'm under a deadline: deleting much more ruthlessly, not responding to things I might normally respond to, um, not opening attachments and things that are just there for information unless I really think I am going to find them useful. And using 'Out-of-office' assistant, because I

> just don't have time, to send out a message telling people not to expect a response this week. (*Participant 5, Organisation X*)

Forty-three percent of participants reported that whilst they may check the inbox they may not 'deal' with it as new email comes in. Thirty-two percent of participants reported that they would check how their email priorities compare with their task priorities and respond accordingly (e.g. if the email had a higher degree of urgency than the task then that would have precedence). However, 32% reported that when working under a deadline they would ignore email completely, sometimes by actually shutting down their email system or working in another room:

> ...I would just ignore it, I wouldn't even-, if I'm in Word or Excel, I wouldn't even open it up, because there isn't time. And if I haven't opened it, I haven't seen it, so I can't worry about it. (*Participant 24, Organisation Zb*)

3.3.2. Task difficulty or importance

Interestingly, the latter response was the most popular reported strategy for dealing with email when working on an important or difficult task, as 56% of participants reported that they would ignore their email in this situation (see question 14 in Table 1):

> I would prefer to work away from my desk and not have access to the email, because one of the things it does is distract you at times, so if I have something new to my line of work then I prefer not to be at my desk. (*Participant 21, Organisation X*)

Thirty-three percent of participants reported that when working on an important or difficult task they would still check their inbox but they also stated that they probably would not deal with it. Twenty-two percent of participants meanwhile would not change their strategy for dealing with email in this situation at all (often this was because they felt their normal strategies were flexible enough to deal with this scenario).

3.3.3. Workload implications

Participants were asked if they had ever felt overloaded by email traffic (see questions 18–22 in Table 1). Sixty-eight percent ($N = 19$) of participants revealed that they had felt overloaded by email, and thus were then asked about the strategies they used to deal with email at such times (see Table 1). Fifty-eight percent of participants experiencing email overload report that they create a prioritisation system to try and relieve the burden:

> ...when I come back and I've got lots of email to read...I will not read them in the sequence they've been coming in. I will be reading them in, you know, red dot importance of topic and prioritise it that way. (*Participant 16, Organisation Y*)

Although others ignore action 'priorities', preferring to deal with each email in turn:

> ...I have this very old-fashioned policy whereby everybody who comes to me is a customer of mine. Uh, if they've been waiting two hours and [my boss] wants something and he's only been waiting five minutes, he has to wait.... (*Participant 22, Organisation Y*)

Forty-two percent of overloaded participants stated that they delete general or irrelevant email at such times (often without having read it), for example:

> If there's any rubbish in there that I can see immediately, just delete it.... Because then visually it doesn't look so bad. (*Participant 15, Organisation Z*).

> I'll delete things that don't-, just by the subject, without even opening them. (*Participant 24, Organisation Zb*)

Thirty-seven percent of overloaded participants stated that they review or scan their inbox to get a flavour of the email they have to deal with, to help relieve the sensation of overload. One participant reported how the strategy for dealing with email over the years had changed so that now overload is not so much of a problem:

> ...I used to get all the-, everyone's emails used to come through, straight to my inbox. Now I put them straight to my deleted box I don't get any of them...Outlook has an organise button, so you can organise where things are actually sent, so...it doesn't go straight into your inbox, it goes to your deleted items. (*Participant 2, Organisation X*)

Nine people reported that they have not felt overloaded by email (see Table 1), and this could be due to the absence contingencies they set up when out of the office, such as automated replies or forwarding functions (reported by 33% of non-overloaded participants), and/or because they feel they are able to control and prioritise their email (reported by 33% of non-overloaded participants), and/or because they feel that email has improved their life and thus is a welcome tool (reported by 33% of non-overloaded participants):

> ...the email system doesn't ever contain any nasty surprises, and I think that's fairly key. I think if I came into work every morning and the in-tray was full of sort of depressing actions and events then I would feel overloaded. But I feel I've got a lot of volume, but to be honest I'm sort of aware of generally what it's referring to. (*Participant 11, Organisation Y*)

3.4. Strategies for dealing with email when demands are low

The previous sections reveal how individuals might deal with email when they are faced with increased demands from their tasks. This section, however, looks at how people may deal with email in undemanding situations, or when they are bored or under-stimulated.

Participants were asked what strategies they would use for dealing with email when working on a boring task (question 15 in Table 1) and 46% of participants reported that they would be likely to read and respond to email on cue, immediately or more readily:

> ...I check the email every time it beeps.... Something like data entry, you are almost looking for something to distract you away from it. So, as soon as it beeps I'll check, because it's the one thing you do when you are not busy, when you have time for it, yeah. (*Participant 21, Organisation X*).

> ...if I'm in a boring task, when it flashes up new email, then I'm straight into it like a shot. And I'll probably spend longer reading it because I want to get away from the boring task. (*Participant 24, Organisation Zb*)

Twenty-nine percent of participants believed that they checked their inbox more frequently, and 29% believed that they did more system 'housekeeping' when bored:

> ...I probably do look through my inbox and emails a bit more and have a bit more of a sort out and maybe delete a few, move a few over, answer the ones that haven't been answered.... (*Participant 1, Organisation Z*)

An equal proportion – 29% – reported that they would not change their strategies when working on a boring task.

3.5. Strategies for dealing with email, when email is relevant to the task

Finally, when the email being sent or received is central to the completion of an important work task, (for example, the communication is part of the task, or the email is being used to transmit important task documents, meeting arrangements, etc.) the following strategies were reported (see question 17 in Table 1). Table 1 shows that 54% of participants reported that they would check their email immediately or more readily and compare this against the task to respond accordingly:

> ...I look at the subject. And I have to say, at times, there are emails I don't read, when I know they send everyone email and it is probably not important. (*Participant 21, Organisation X*)

Eighteen percent reported that there would be no change in their dealing of email (again, often because they felt their normal strategies were flexible enough to deal with this scenario). Fourteen percent of participants reported that they would encourage a timely response from the email recipient when sending email.

4. Discussion

The idea that email is a different type of interruption to that previously discussed in the literature is borne out from the interviews. Indeed, email interruptions are 'controllable' – they do not force people's attention away from a main task, and do not obligate the recipient to deal with the interruption, even when their attention *has* been captured. For although most people will check an email immediately on hearing an alert, participants also report that they then engage in some kind of decision-making process before they will actually process the email. In other words they appear to be involved in 'negotiating' (McFarlane, 2002) their response, based on the parameters of the task or the email itself.

The key findings are that:

- people use a wide range of different strategies for dealing with email;
- people's strategies for dealing with email interruptions will change according to the situational parameters afforded by the task or email, in particular:
  - when people are faced with demanding situations (e.g. if their task is important, difficult or time pressured) they engage in strategies for ignoring email interruptions;
  - when people are faced with 'boring' tasks they are more likely to respond to an email interruption immediately and spend more time dealing with it;
  - when people are expecting an email that is important to their main task they engage in strategies to ensure that the email is received as expediently as possible (extra checking, encouraging social partners to respond quickly, etc.);

  - when people are overloaded by email interruptions they apply strategies to reduce perception of load (such as deleting 'unread' email, using prioritisation systems, etc.);
- there are individual differences in the use of strategies in any given situation. For example, even though 32% of participants would ignore email completely when working under a deadline, 43% of participants continue to check email at such times.

Hacker's (1985, 1994) Action Regulation Theory (ART) provides an explanation for how individuals plan and regulate their work activities at different levels according to the situation demands, environmental changes (such as interruptions) and social influences that impact upon goal pursuit (Frese & Sabini, 1985; Frese, Stewart, & Hannover, 1987; Frese & Zapf, 1994; Hacker, 1985, 1994). ART postures that because activity at work is goal-oriented, individuals who are able to exercise control over their work attempt to work optimally and produce the most efficient behaviour by use of conscious strategies or 'action programs' (Hacker, 1994). Thus action has a purpose and is actively decided upon:

> Action Theory stresses the way we go about creating specific plans in specific environments to reach specific goals.... It also suggests we have at hand abstract, schematic plans [telling us what environmental information is needed to hone these plans], and heuristics telling us how to proceed once we have that initial information. (Frese & Sabini, 1985, p. xxiv)

The strategic responses reported by participants in the exploratory study show support for ART's premise that people who can control their response to work will attempt to use efficient action programs (Hacker, 1985, 1994). For example, participants reported that they tend to deal with an email 'immediately', even though they have the choice to delay it (Jackson, Dawson, & Wilson, 2003; van Solingen et al., 1998). van Solingen et al. (1998) found that postponed interruptions were three times more difficult to process. Thus, dealing with email immediately, under normal circumstances, appears to be a strategy that may be linked with efficient performance (Altmann & Trafton, 2002; Einstein et al., 2003; Trafton et al., 2003).

This study also demonstrated how strategy choice is affected by both situational differences and the level of regulation one engages. For example, when a task is difficult (and therefore requires a high level of regulation) people may be more likely to ignore an incoming email interruption. When a task is boring (and involves operating at a low level of regulation) people may speedily respond to an incoming email interruption. It seems feasible that all the listed ART goal parameters (such as goal difficulty and valence) provided by Frese and Zapf (see their 1994 paper) should warrant research attention now, to identify which characteristics of both the current goal and the new goal (afforded by the email) appear to influence both the level of regulation *and* the differential application of strategy choice, for dealing with email interruptions.

However, situational parameters and levels of regulation alone do not appear to explain the dynamic and adaptive choice of strategy that individuals are engaged in. Individuals adopted different strategic responses for dealing with the same situation. Some people are email 'ignorers' and others are very quick to respond to email. This may indicate dispositional differences in personality or motivational style. Frese et al. (1987) have validated the presence of 'Goal Orientation' or 'Planfulness' action styles, but despite having acknowledged the importance of these (Frese & Zapf, 1994; Frese et al., 1987; Miller, Galanter, & Pribram, 1960) ART has yet to use a structured, taxo-

nomical measure of personality to identify whether and how it is linked to strategy choice and efficiency.

5. Implications

The current study has facilitated a greater understanding of the personal action programs and strategies that are being applied to deal with email interruptions at work. Action Regulation Theory offers a useful framework for interpreting these results. People do appear to try and optimise efficiency at work, as stated by Hacker (1985, 1994), and they also appear to adopt different strategies for dealing with email interruptions, according to the parameter of the situation and the level of regulation engaged. However, these results indicate that ART may require some refinement or clarification on the issue of individual differences. Level of regulation and situational parameters alone does not predict strategy choice here, and it appears as though people have different definitions of efficiency if some believe that ignoring an email is effective, whereas others will usually attend on cue. Therefore, further research is needed to:

- Ascertain how the different goal parameters, listed by ART, influence strategic response.
- Explore whether individual differences in definitions of efficiency affect strategic response. For example, people who prioritise achieving single goals well may ignore interruptions when demands are high, whereas those who prioritise achieving multiple goals may be more inclined to attend to other goals (i.e. to interrupting email).
- Examine whether and how personality or motivational style affects the choice of action programs and subsequent efficiency, using a structured and purposeful framework of individual differences (Frese et al., 1987; Frese & Zapf, 1994; Hockey, 2002; Miller et al., 1960).

6. Conclusion

This exploratory study aimed to ascertain what strategies people might use for dealing with email interruptions at work. Whilst previous research into interruptions have focused on the forced nature of the intrusion to a cognitive task, some of this work has yielded findings suggesting that whether the outcome is disruptive or not may in part depend on how much control one has over the impact of the interruption. Email interruption is a form of interruption that can be controlled. For although an email alert may intrude upon consciousness, people have decision latitude to negotiate when, whether and how to respond to the interruption. Thus, understanding what people choose to do with email interruptions when working on another task, facilitates understanding of what variables may be involved in goal-directed decision making. In this instance, participants reported on the application of a number of different strategies, differing according to task goal and email parameters, and also according to individual differences. In particular, it appears that people are devising strategies to optimise their efficiency at dealing with work goals in the face of email interruptions, but whereas some people may take a ‘big picture’ view and remain open to activity associated with other goals (i.e. by attending to an interruption), others tend to remain focused on individual goals (i.e. by ignoring an interruption).

This highlights the need to assess which strategies are associated with goal success, both at the individual action program level, and at a multi-goal level. It also highlights the need to explore individual differences in definitions of success and strategy choice. This will not only help to clarify the position within Action Regulation Theory, but can also provide further insights into how email interruptions play a unique part in infiltrating the processes involved in goal-directed activity at work.

Acknowledgement

Grateful thanks to Professor Fred Zijlstra for his comments on an earlier version of this paper.

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