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Interruptions, task type and the experience of boredom

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Interruptions, Task Type, and the Experience of Boredom

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Interruptions, Task Type, and the Experience of Boredom

Summary

This study investigated the effect of three levels of interruptions on self-reports of boredom for three tasks. The literature suggests that performers are bored when they experience attentional difficulties. One cause of attentional difficulties is interruptions from the environment. Interruptions which trigger continuing thoughts about concerns of the performer should be more distracting than interruptions which merely temporarily remove attention from the task. Thus, three levels of interruption were operationalized: none, irrelevant to the performer, and concern-related. In a between subjects design, these were crossed with three types of tasks varying in complexity and the amount of attention required for performance. We hypothesized that interruption and task condition would interact to affect boredom, such that interruptions would reduce boredom on simple, low attention tasks by providing additional stimulation, but increase boredom on simple tasks which require attention and on complex tasks. These effects were expected to be more pronounced for concern-related interruptions than for irrelevant interruptions. It was also hypothesized that extraversion would condition the reaction to interruption. Results showed that interruptions caused lower boredom on the simple low attention task but slightly increased boredom on the complex, high attention task, regardless of extraversion.
Interruptions, Task Type, and the Experience of Boredom

Boredom at work is experience by nearly everyone at some time or other, yet it has been largely ignored by organizational researchers. Boredom has noteworthy consequences in the form of job dissatisfaction, turnover, accidents, and performance decrements, so further attention to understanding its causes seems warranted (Fisher, 1993). This paper focuses on one possible yet unresearched contributor to boredom: interruptions which disrupt task-focused attention.

Much of the research on boredom conducted by industrial engineers and industrial psychologists since the 1920s has focused on task characteristics as primary contributors to feelings of boredom. Jobs which are simple, repetitive, and can be carried out with minimal thought and attention, such as some assembly line jobs, are likely to be experienced as monotonous and boring (Cox, 1980; Smith, 1981). The other type of job often considered boring consists of vigilance or inspection types of activities. These activities require continuous attention but provide very little meaningful stimulation in return (Thackray, Bailey, & Touchstone, 1977). Non-boring jobs are those which require attention and also provide stimulation in return for attention, in the form of variety, challenge, feedback, and the like (Hackman and Oldham, 1980).

However, it is extremely unlikely that all causes of boredom reside in task characteristics. The same task can be interesting to one person but boring to another. Even to the same person, a given task may be very involving at times and excruciatingly boring at other times. Fisher (1993) has reviewed the literature and suggested that other contributors to boredom include aspects of the work context, personality, social influence, task-related schema complexity, and interruptions in the form of intrusive thoughts about current concerns.
Boredom and Attention

Several researchers have suggested that attentional difficulties are at the root of boredom (Fisher, 1993; Hamilton, 1981; Leary, Rogers, Canfield, & Coe, 1986). When people feel bored, they report not being able to keep their attention on the task at hand, or having to exert considerable effort to keep their attention focused on the task. Damrad-Frye and Laird (1989, p. 316) state that, "the essential behavioral component of boredom is the struggle to maintain attention." Boredom might be considered the opposite of the effortlessly focused attentional state called "flow" by Csikszentmihalyi (1975), in which there is complete involvement in the task and no awareness of distractions.

Thus, one path to understanding the causes of boredom might be to ask which environment or internal factors create attentional difficulties by distracting or disrupting concentration, then to see whether these are associated with feelings of boredom with the focal task. If environmental factors which produce attentional difficulties are sometimes present and sometimes absent, they could help explain why the same task is sometimes experienced as interesting and sometimes as boring by the same performer.

Damrad-Frye and Laird (1989) experimented with one form of environmental distractor and found that it did contribute to feelings of boredom. They set up three conditions for an auditory task: no distraction (quiet environment), low volume distraction (television playing on low volume in an adjoining room), and high volume distraction (television playing loudly in an adjoining room). Subjects in the no distraction condition had few attentional difficulties and did not report being bored. The low volume condition was such that subjects seldom noticed the television and did not remark on it as a possible cause of distraction, but in fact it did make their job of attending to the task material more difficult. These subjects reported that they felt bored and the task itself was boring. Interestingly, some of those in the high volume condition did not report being bored. Apparently because they had a clearly salient external
cause for their attention problems - the unmistakably loud television - they did not have to conclude that the task must be boring in order to explain their attentional difficulty. In sum, it seems likely that anything which distracts one from a task, especially if it does so subtly, could cause a person to label their feeling state as boredom, and to conclude that the task itself is boring and dissatisfying.

Interruptions

One type of distraction which is increasingly common for many job holders is some form of brief external interruption. The advent of mobile phones, e-mail networks, and fax machines means that office and professional employees are frequently interrupted as they attempt to concentrate on one task. One computer network to which I subscribe to produces 20 or more messages per day, repeatedly if momentarily disrupting the concentration of numerous academic subscribers who may be attempting to complete other tasks on their computers. Very little is known about the effects of being interrupted while in the midst of performing a task, though the above rationale suggests that the effort required to return attention to the pre-interruption task may cause that task to be experienced as less interesting.

There is very little research on the effect of interruptions on affective reactions to tasks. Kirmeyer (1988) found that the frequency with which interruptions pre-empted on-going work or caused police dispatchers to have to do two things at once was correlated with a scale assessing overload/stress/pressure. Williams, Suls, Alliger, Learner, and Wan's (1991) research on "role juggling" and mood among working mothers is also potentially relevant to interruptions. Using experience sampling methodology, they defined "interrole juggling" as performing tasks from more than one role (work, or family, or social) in the previous 30 minute period. Results showed that interrole juggling was related to reduced task enjoyment and increased negative mood.
Current Concerns

Distractions or interruptions which cause attentional difficulties need not come solely from outside the individual. Attentional difficulties may also occur due to intrusive thoughts or daydreams which are internally generated (Antrobus, Singer, & Greenberg, 1966; Klos & Singer, 1981). Eric Klinger (1977) has devoted two decades to studying patterns of thought content, and has much to contribute to understanding when and why non-task-related thoughts occur. A central concept in Klinger's work is the current concern. A current concern is a goal which the person has committed to pursue. Concerns may be as short term as getting lunch or as long term as career success. Not all current concerns are constantly in the forefront of one’s thoughts, but concerns which Klinger's subjects identified as most important on questionnaires or in interviews did occur quite frequently in the themes of thought samples collected at random intervals in the next few days (Klinger, Barta, & Maxeiner, 1980). About 50% of the thought samples had to do with the two most important concerns nominated by each subject. Other researchers have found that 65% of day dreams are related to important current concerns (Gold & Reilly, 1985-86).

Concerns most likely to be represented in thought are those which are highly valued, likely to be attained, under threat of not being attained, or requiring action in the near future (Klinger et al. 1980). Thoughts about such important concerns may intrude from time to time when an individual is performing another activity. "A person working on a mental task who is in the grip of a very strong concern about something else will have trouble keeping his or her mind on what he or she is doing—he or she will be fighting a lot of mind wandering." (Klinger, 1977, p. 61). If these thoughts about current concerns divert attention from the present task, and require an effort of will to return attention to the task, it seems quite possible that performers will feel bored with the task.
Thoughts about current concerns can occur spontaneously, but can also be prompted by cues in the environment. An external interruption which first disrupts attention by its mere occurrence and then prompts continuing thoughts about a current concern might have the most severe effects on attention and concentration. An example would be an employee being interrupted by a phone call (external interruption) which then triggers continuing thoughts related to the call or the caller after the phone is put down (internal interruptions).

This study will compare a no interruption control condition, to a purely external, concern-irrelevant interruption condition, to a concern-relevant interruption condition. Subjects in the latter condition are expected to experience further internal interruptions and greater total distraction due to the concern-related prompts in the interruptions. Thus, a tentative hypothesis might be that there will be a main effect for interruption, such that subjects who are not interrupted will be least bored, those who are interrupted by irrelevant events will be more bored, and those interrupted by concern-related interruptions will be most bored. However, the effect of interruptions may vary with the attention requirements of the task being performed, as discussed below.

Task Type and Reactions to Interruptions

Because interruptions are expected to affect boredom via their effect on attention, it is necessary to consider the amount of attention required by the focal task. Boredom researchers have studied two distinct types of low stimulation tasks: simple visual or auditory tasks which provide little variety or stimulation but require continuous attention (e.g. inspection, vigilance tasks); and simple physical tasks which do not require much attention and can be performed automatically (e.g. repetitive manual tasks). Simple tasks which require continuous attention should be highly disrupted by interruptions, and the performer may be most acutely aware of the effort involved in returning full attention to the unrewarding task after the interruption. Thus, performers on
this type of task should be likely to feel bored after having been interrupted. Concern-related interruptions should cause continuing difficulty in paying attention to the task, and therefore should result in greater boredom than irrelevant interruptions on a simple attention-requiring task.

Complex tasks almost by definition require attention (we were unable to think of an interesting task which did not require attention), so concentration or "flow" will certainly be disrupted by interruptions. Complex tasks usually have high information processing and short term memory requirements, such that performers need to "begin again" to recapture their trains of thought following an interruption. These characteristics should make interruptions particularly bothersome for performers of complex tasks.

Individuals performing physical tasks requiring little attention may be less bothered by interruptions. In fact, interruptions may provide welcome mental relief and stimulation while the routine task is performed automatically. Conceivably, concern-relevant interruptions would be the most entertaining due to their longer lasting impact, and thus boredom may actually be lower following concern-related interruptions than irrelevant interruptions for a routine, low attention task.

In sum, we hypothesize that interruption and task condition will interact to affect boredom, such that interruptions will reduce boredom on simple, low attention tasks but increase boredom on simple tasks which require attention and on complex tasks. These effects should be more pronounced for concern-related interruptions than for irrelevant interruptions.

Individual Differences: The Case for Extraversion

Previous research has shown that reactions to unstimulating tasks are affected by individual differences in the amount of stimulation desired. The best supported personality moderator of reactions to unstimulating tasks is introversion/extraversion (Gardner & Cummings, 1989). Extraverts need more
external stimulation to maintain an optimal level of arousal, so they tend to suffer most when stimulation from the task is low. Extraverts show greater performance decrements on vigilance tasks, report being more bored on simple tasks, prefer jobs with more mental demands and faster pace, and introduce more variability in methods when working on routine tasks (Davies & Parasuraman, 1982; Gardner & Cummings, 1988; Hill 1975a; Sterns, Alexander, Barrett, & Dambrot, 1983). Thus, all other things being equal, extraverts would be expected to report being more bored than introverts on the two simple tasks used in this study.

However, Damrad-Frye and Laird (1989) found that introverts were most bothered and bored in their low volume distraction condition. Extraverts were not affected until the distracting external stimuli reached high levels. This suggests that interruptions may provide additional stimulation which pushes introverts above their optimal arousal level, thus compromising concentration and producing boredom, while extraverts may thrive on the additional stimulation provided by interruptions up to a point, as they move from sub-optimal to optimal arousal. We hypothesize that extraversion will interact with interruption to affect boredom, such that introverts will be negatively affected by all interruptions, while extraverts will be unaffected or positively affected by interruptions.

METHOD

Subjects
Subjects were 181 university students who were paid $15 (Aus) for an hour of their time. 41% were female. The average age was 21, and the subjects had an average of 13 months of full time and 16 months of part time work experience.
Design and Procedure

The design was a 3 X 3 between subjects design, with three levels of interruptions (none, irrelevant, concern-related) and three types of tasks (simple/low attention, simple/high attention, complex). Cell sizes varied from 18 to 23. Subjects were scheduled to be run in groups of 10, but due to absenteeism and rescheduling, actual group sizes varied from 3 to 12.

Subjects were first oriented to their task, then told to work on the task until asked to stop by the experimenter. All work periods lasted 20 minutes, and any interruptions occurred during the work period. After the work period, subjects completed a questionnaire about their perceptions of the task and filled out the extraversion scale, then were paid for their time and asked not to discuss the experiment with anyone else.

Tasks

Three experimental tasks were used. The simple low attention task was a repetitive manual assembly task. Subjects were given a 1 foot by 2 foot square of pegboard and a supply of 3/16 by 2 inch bolts with nuts. The task was to insert the bolts through the board and screw the nut down snugly, one bolt at a time. The simple high attention task involved proof reading a list of names and addresses. In order to increase the concentration requirements of this task, the correct address master featured page-wide lines of text (about two lines per address) while the addresses to be proofed were in label format (four lines per address). Two hundred addresses were to be proofed, and one hundred errors had been introduced into the labels. Subjects were instructed to circle errors in the labels with a red pen. The complex task was an in-basket for an advertising manager. Subjects made a series of decisions of varying complexity involving human resource management, work scheduling, copy writing, and strategic direction at an advertising agency.
The three tasks had previously been piloted to assure that the two simple tasks were about equally boring, that the complex task was in fact interesting, and that the two simple tasks were significantly different in the amount of attention required to perform them. Manipulation checks (reported below) confirmed that the tasks were perceived as intended in the main study as well.

Interruptions

The experimental room was arranged to control extraneous distractions. All work tables faced walls and all window blinds were closed. The experimenter sat quietly except when planned interruptions took place. Subjects in the no-interruption condition completed their 20 minute work period without any interruptions. Subjects in both interruption conditions experienced 4 interruptions in the space of 20 minutes, at 4, 10, 14, and 16 minutes into the session. The first, second, and last interruptions involved a person entering the room and speaking, while the third interruption was a phone call to the experimenter which subjects overheard. The person doing the interrupting was the same in both conditions, though she played a different role in each condition.

The irrelevant interruptions featured a person dressed as a maintenance worker entering the room to carry out tasks associated with furniture inventorying and moving. For the first interruption, subjects were informed about the purpose and frequency of the university's property inventory, then were asked to stop work, get up, and report whether or not there was an inventory control sticker under their chair. The second interruption involved a brief statement to the experimenter that the interrupter needed to count the number of tables and chairs in the room, followed by an obvious count. The third interruption was a phone call in which the experimenter's side of the conversation was about scheduling the research room for the coming week. The
In writing the script for the current concern interruptions, we were careful to use an equal number of positive/happy (i.e., an upcoming holiday or wedding) and negative/unhappy (financial or employment problems) examples, in an effort to avoid confounding this manipulation with mood. The actual examples used were drawn from a genuine survey conducted several months previously at the same university, in which students were asked to list their...
most pressing current concerns and rate their valence. By using many of the frequently listed events/concerns, we hoped to strike a chord in nearly all subjects, and stimulate them to further thought about one or more issues of relevance to them.

Measures
Aspects of boredom were assessed by 22 items developed from the literature on boredom and previously piloted on student samples. Seventeen of the items were rated on a five point scale ranging from "not at all" to "extremely" in terms of how well the statement characterized the feelings experienced by respondents while working on the task. The other five items also used a five point response format, with anchors specific to the question being asked. Two earlier studies on the scale properties of similar sets of boredom items suggested that several factors were present, and this was again the case in the main study. A principle components analysis of the 22 items produced 4 factors accounting for 69% of the variance.

Four scales relating to aspects of boredom were constructed utilizing the items with loadings greater than .50 (shown in bold type in Table 1). The first factor suggests a scale called "mind-wandering" containing 6 items, with a coefficient alpha of .91. Most of these items indicate a passive, detached feeling in which thoughts unrelated to the present task occur. The five item scale based on the second factor was called "boredom" (versus interest) and had a reliability of .92. Items indicating interest and task enjoyment were reverse scored when added into the boredom scale. The third scale was called "symptoms of boredom" and included almost physical sensations such as restlessness, irritability, and frustration. Prior research has confirmed that these "itchy" feelings usually accompany boredom (O'Hanlon, 1981) Reliability of this scale was .82. The final scale was called "inattention." It had a reliability of .85 and included reverse coded items like alert, focused on task, and attentive. The
average intercorrelation among these scales was .56, with values ranging from .46 to .66.

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Insert Table 1 Here

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Introversion/extraversion was measured with Form A of the Eysenck Personality Inventory (1964). 24 dichotomously scored items form the I-E subscale of this commonly used instrument. The manual reports split-half reliabilities of around .75 and test-retest reliabilities of over .80 for a one year interval.

Additional questions were asked about “how much attention was required to do the task” and “how much a person needed to concentrate on this task in order to do it reasonably well.” Responses to these items were correlated .84, so they were averaged and used as a manipulation check for attention requirements of the tasks. A high score means high attention demand.

RESULTS

Manipulation Checks

The two simple tasks were designed to be seen as boring, and the complex task as interesting. Looking at responses in the control (no interruption) condition, the simple low-attention task was rated 4.26 on the five item boredom versus interest scale, the simple high-attention task was rated 3.98, and the complex task was rated 2.19. Given that the scale could range from 5.00 (very boring) to 1.00 (very interesting, fascinating, etc.), it is clear that the two simple tasks are seen as quite boring, and the complex task as interesting. A one-way analysis of variance on task was significant (F = 44.7, p < .001), with a Scheffe test showing that the two simple tasks were not significantly different from each other, but both were significantly more boring than the complex task.
The tasks were also supposed to differ systematically on the degree of attention and concentration required to complete them successfully. The simple low-attention task averaged 2.08 on the 1 - 5 attention/concentration scale, the simple high-attention task was rated 3.95, and the complex task was rated 4.45. Again, a one-way ANOVA on task using control condition subjects was significant ($F = 57.8, p < .001$), and Scheffe tests supported the desired differences: the low-attention task was significantly lower than the other two, which were not significantly different from each other.

Analyses

The dependent variables were the four scales constructed from the boredom items: mind-wandering, boredom (versus interest), symptoms of boredom, and inattention. These were first entered into a 3 (task) by 3 (interruption condition) MANOVA. As expected, there was a huge effect for task, reconfirming the above manipulation check. More interestingly, there was also a significant multivariate main effect for interruption ($F = 2.37, p < .02$), and a significant task by interruption interaction effect ($F = 2.16, p < .01$). Subsequent univariate ANOVA results are summarized in Table 2, with the interactions being more noteworthy (three reaching conventional levels of significance) than the interruption main effects. The interactions are shown graphically in Figures 1a - 1d. The hypothesis that the effect of interruptions on indicators of boredom would depend on the type of task being performed was supported.

Insert Table 2 and Figures 1a - 1d Here

For the simple low attention (nut and bolt) task, all indicators of boredom showed the same pattern: boredom was highest when there were no interruptions, and lower when interruptions occurred. One-way ANOVAs followed by Scheffe tests for this task showed that symptoms of boredom were
significantly lower following the current concerns interruptions than no interruptions. Inattention and mind wandering were significantly lower following any interruption than when there was no interruption. Interruption condition did not have a significant effect on the boredom versus interest scale for the simple low attention task, though the pattern of means is similar to the other dependent variables. As predicted, interruptions generally improve reactions to a low attention task, perhaps by providing needed additional stimulation. Apparently, being distracted from a task is not problematic when the task requires very little attention.

For the simple, high attention task, interruption condition did not seem to matter. None of the one-way ANOVAs were significant for this task. This is contrary to expectations, as being interrupted while trying to concentrate, even on a routine task, should produce attentional difficulties and the sensation of needing to force attention back to the task.

The complex task displays a pattern opposite to that for the simple low attention task. Indicators of boredom are generally lowest when there are no interruptions and higher when there are interruptions, though these differences do not reach conventional levels of significance. Thus, while the means are in the expected direction, we cannot state with certainty that interruptions increase indicators of boredom on complex tasks. The exception is for symptoms of boredom, which are significantly higher under irrelevant interruptions than concern-related interruptions.

In retrospect, there is little direct evidence that the current concern interruption manipulation had the intended effect of producing additional intrusive thoughts between staged interruptions. Mind wandering was not significantly greater within task for the current concern versus irrelevant interruption, but such a difference would be expected if the former triggered additional internally generated interruptions. In most cases, the irrelevant versus current concerns interruptions did not have significantly different effects,
suggesting that it is the fact of the interruption rather than its precise content which was important in this study.

Personality moderator analyses were conducted by multiple regression, with cross products being entered after task, interruption, and extraversion. The beta weight for extraversion predicting symptoms of boredom was significant (t = -2.05, p<.05), such that the more extraverted reported fewer symptoms of boredom (r = -.14). This is the reverse of what the literature would suggest. None of the other main effects for extraversion, and none of the cross product terms involving extraversion, contributed significantly to the prediction of any of the boredom scales. Thus, there is no support for extraversion as a moderator of the relationship between interruptions or tasks and indicators of boredom.

DISCUSSION

This research took the first few steps toward exploring an issue which is increasingly common among today's knowledge workers: being interrupted by unrelated events or information while trying to work on a focal task. The results generally supported the hypothesized interruption by task interactions. Interruptions made very simple, low-attention tasks seem less boring, but made complex high-attention tasks slightly more boring and difficult to attend to. This pattern held regardless of individual differences in extraversion.

It was hypothesized that interruptions which reminded people of important current concerns might create the largest effects, by stimulating further internally generated thoughts which would continue to interrupt and distract performers from their task. This did not occur. The current concern manipulation was a generic effort to induce thoughts about current concerns by priming concerns common to many students. Perhaps it failed because it was too generic. Klinger (1977) successfully raised the incidence of thoughts about current concerns in his subjects by providing them with very specific cues, custom-made for each subject based on interviews about each person's concerns.
conducted on the previous day. Short of this laborious procedure, it seems
difficult to experimentally manipulate the extent of internally generated
thoughts about current concerns. However, everyday experience continues to
suggest that intrusive thoughts about important concerns DO make it more
difficult to concentrate on an unrelated task, and DO contribute to feelings of
boredom while working on the task. A better understanding of when and why
non-work-related thoughts intrude to disturb employee concentration may be
useful in understanding not just reactions to work tasks and environments, but
also the dynamics of the work - family or work - non-work interface.

As noted above, both irrelevant and concern-related interruptions had
fairly similar effects on boredom. Perhaps this is not surprising, as the two
interruption manipulations were similar in a number of ways. Both featured
the same players, lasted the same length of time, occurred at the same intervals,
and were unrelated to performance on the current task. It is possible that an
interruption which is related to the task (for instance, an interruption to present
more information needed to progress on the task, or feedback on recent task
performance) would be less disruptive of concentration on a complex task, and
perhaps provide less relief in the form of truly novel stimulation on a very
simple task. Other characteristics of both interruptions and tasks may also be
important. For instance, one might speculate that interruptions would be
especially irritating if they were very frequent, if incumbents were under time
pressure, or if the task had heavy short-term memory requirements which were
easily disrupted. These are questions which can be addressed in future research.

The interruptions in this study were also quite blatant, yet the Damrad-
Frye and Laird study (1989) found that some subjects were most bored when
interruptions were subtle. If there is an attributional process involved, subjects
who know exactly why they are having trouble concentrating (an unmistakable
interruption) may have less need to conclude that the task is boring or that their
attentional problems are due to boredom. On the other hand, technology seems
likely to increase the number of blatant interruptions received by many employees, so perhaps this is where research should be concentrated.

The added stimulation provided by interruptions had neither more nor less effect on boredom among extraverts, ostensibly predisposed to desire greater amounts of stimulation. The failure of extraversion to produce even a main effect on boredom is unexpected but not without precedent. Extraversion is not always related to self-reports of boredom (Hill, 1975b), but seems to be more consistently related to performance decrements on routine or vigilance tasks. Perhaps other individual differences, such as Type A personality, would be more likely to affect the manner in which performers react to interruptions.

Current thought about organizations and jobs in the future (c.f. Peters, 1992) suggests that organizational structures will continue to flatten, teamwork will become even more pervasive, and horizontal communication will increase exponentially over the next few years. All of these trends, plus communication technology such as pagers, mobile phones, and e-mail, will make it more and more likely that employees will be interrupted as they try to concentrate on individual tasks in the future. As shown in this study, interruptions are not always viewed negatively, but they may have harmful effects on task interest and concentration for complex tasks. It is critical to understand the effects of interruptions on employee reactions, and perhaps to integrate these findings into job-design recommendations for the future. Further research on the effects of interruptions seems strongly warranted.
REFERENCES


### TABLE 1
Rotated Factor Loadings for Boredom Items

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Mind Wandering</th>
<th>Boredom</th>
<th>Symptoms of Boredom</th>
<th>Inattention</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Alert</td>
<td>-.18</td>
<td>.23</td>
<td>-.19</td>
<td>.62</td>
</tr>
<tr>
<td>2. Time was dragging</td>
<td>.29</td>
<td>-.45</td>
<td>.47</td>
<td>-.01</td>
</tr>
<tr>
<td>3. Bored</td>
<td>.35</td>
<td>-.69</td>
<td>.42</td>
<td>-.05</td>
</tr>
<tr>
<td>4. Restless</td>
<td>.35</td>
<td>-.48</td>
<td>.57</td>
<td>-.03</td>
</tr>
<tr>
<td>5. Fascinated by the task</td>
<td>-.12</td>
<td>.81</td>
<td>.08</td>
<td>.20</td>
</tr>
<tr>
<td>6. Irritable</td>
<td>.14</td>
<td>-.17</td>
<td>.77</td>
<td>-.08</td>
</tr>
<tr>
<td>7. Unable to concentrate</td>
<td>.32</td>
<td>.07</td>
<td>.55</td>
<td>-.36</td>
</tr>
<tr>
<td>8. Focused on the task</td>
<td>-.25</td>
<td>.23</td>
<td>-.17</td>
<td>.76</td>
</tr>
<tr>
<td>9. Mind was wandering</td>
<td>.74</td>
<td>-.20</td>
<td>.23</td>
<td>-.08</td>
</tr>
<tr>
<td>10. Frustrated</td>
<td>.18</td>
<td>-.05</td>
<td>.81</td>
<td>-.11</td>
</tr>
<tr>
<td>11. Enjoying the task</td>
<td>-.15</td>
<td>.81</td>
<td>-.10</td>
<td>.37</td>
</tr>
<tr>
<td>12. Attentive</td>
<td>-.23</td>
<td>.28</td>
<td>-.11</td>
<td>.74</td>
</tr>
<tr>
<td>13. Distracted</td>
<td>.65</td>
<td>-.10</td>
<td>.24</td>
<td>-.23</td>
</tr>
<tr>
<td>14. Interested in the task</td>
<td>-.14</td>
<td>.84</td>
<td>-.09</td>
<td>.34</td>
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<tr>
<td>15. Day-dreaming</td>
<td>.85</td>
<td>-.20</td>
<td>.20</td>
<td>-.15</td>
</tr>
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<td>16. Involved in task</td>
<td>-.34</td>
<td>.49</td>
<td>-.09</td>
<td>.57</td>
</tr>
<tr>
<td>17. Off in another world</td>
<td>.85</td>
<td>-.06</td>
<td>.20</td>
<td>-.21</td>
</tr>
<tr>
<td>18. How frustrating was working on this task? 5 = very</td>
<td>.03</td>
<td>-.04</td>
<td>.73</td>
<td>-.37</td>
</tr>
<tr>
<td>19. To what extent did your mind wander to other topics while working on this task? 5 = none</td>
<td>-.74</td>
<td>.25</td>
<td>-.06</td>
<td>.36</td>
</tr>
<tr>
<td>20. How hard was it to keep your attention on this task? 5 = very hard</td>
<td>.26</td>
<td>-.29</td>
<td>.32</td>
<td>-.54</td>
</tr>
<tr>
<td>21. How boring or interesting was the task? 5 = very boring</td>
<td>.21</td>
<td>-.81</td>
<td>.22</td>
<td>-.27</td>
</tr>
<tr>
<td>22. During the work period, how often did you think about other things outside of this experiment? 5 = almost never</td>
<td>-.70</td>
<td>.32</td>
<td>-.05</td>
<td>.26</td>
</tr>
</tbody>
</table>
TABLE 2
F Statistics for Univariate ANOVAs

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Task Main Effect</th>
<th>Interruption Main Effect</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mind Wandering</td>
<td>38.35**</td>
<td>.93</td>
<td>4.28**</td>
</tr>
<tr>
<td>Boredom (versus interest)</td>
<td>55.35**</td>
<td>1.05</td>
<td>1.72</td>
</tr>
<tr>
<td>Symptoms of Boredom</td>
<td>4.40*</td>
<td>2.69+</td>
<td>2.51*</td>
</tr>
<tr>
<td>Inattention</td>
<td>15.62**</td>
<td>2.34+</td>
<td>3.12*</td>
</tr>
</tbody>
</table>

N approximately 181
+ p < .10
* p < .05
** p < .01
Figures 1a - 1d

Interactions of Task Type and Interruption
Concern-Related

Simple Low Attention Task

Simple High Attention Task

Complex Task

Irrelevant Interruption

Mind Wandering

None

Irrelevant Interruption

Concern-Related

Boredom vs Interest

None

Irrelevant Interruption

Concern-Related
Symptoms of Boredom

None | Irrelevant | Concern-Related

Inattention

None | Irrelevant | Concern-Related