

The Effects of Interruptions on Remembering Task Information

Terri L. Lenox
lenoxtl@westminster.edu
Westminster College
New Wilmington, PA 16172

Neil Pilarski
Neil.Pilarski@gmail.com
H. J. Heinz III College
Carnegie Mellon University
Pittsburgh, PA 15213

Lance Leathers
lanceleathers@gmail.com
Duquesne University
Pittsburgh, PA 15282

Abstract

Interruptions can cause us to take longer to complete our tasks and lower the quality of the results. Yet, we are interrupted frequently in our daily lives by other people, by ourselves, and by our computers. We may not be able to control some of these interruptions, but it should be possible to create computer interfaces that control the interruptions. Two methods are examined in this paper. The first method is to allow the user to postpone the secondary task (the interruption). The second method is to allow the user to take a note about the current task before moving on to the interruption. In the first experiment, subjects had the choice to postpone or not and in the high cognitive workload task, 83% chose to postpone. In the second experiment, memory for details of the task was examined when the user postponed the secondary task and when they did not. There were no significant differences between the two conditions. In the final experiment, some subjects could take a note about the primary task. Counter intuitively, the subjects who could not take a note performed better on the task, but not significantly.

Keywords: interruptions

1. INTRODUCTION

Interruptions are a fact of everyday life. While trying to complete a task, we can be interrupted multiple times by external people or events or by ourselves. For example, a typical information worker is interrupted every 12 minutes, with

most of these self-interruptions (Jin & Dabbish, 2009). The main effects of an interruption appear to be negative; the time to complete the primary task increases and the quality of the results may decrease.

When an interruption occurs, a person is working on a *primary task*. The user must deal with the interruption and complete the *secondary task*. To work on the secondary task, a *problem state* for the primary task is kept in memory. This problem state essentially “saves your place” by remembering some temporary task-relevant information. Interruptions vary in their duration and the interrupted and secondary tasks vary in cognitive workload required to complete them. Lag time is the amount of time it takes an individual to continue work after an interruption.

Many of the modifications to existing user interfaces attempt to assist users in dealing more effectively with interruptions. One way determines the most effective time for an interrupt to occur (McFarlane & Latorella, 2002). Another way tries to limit resumption lag. *Resumption lag* is the time needed to resume the primary task after an interruption.

These two methods of handling interruptions are discussed in this paper. The first two experiments examined the capability to defer an interruption when it occurs. When an alert appears telling the user there is a secondary task, the user decides whether or not to complete the secondary task then or to defer it until a later time. The third experiment examined whether or not taking notes about the problem state of the primary task helped subjects return to it after an interruption, effectively reducing the resumption lag.

2. LITERATURE REVIEW

Much research has been done on the potential impact of interruptions and their effects on people, and in the past 15 years the focus has turned to people using computers. Mark, Gonzalez, and Harris (2005) found that work is highly fragmented as seen by shorter amounts of time on a task and an increase in the number of interruptions. Information workers switch work events frequently; averaging every three minutes (Gonzalez & Mark, 2004). Differences were found due to the type of work (central or peripheral) (Mark et al, 2005), cognitive workload of task (Dismukes, Loukopoulos & Jobe, 1998), or timing of the interruption (McFarlane & Latorella, 2002).

During an interruption, work becomes fragmented and the cognitive representations supporting the primary task performance will

decay. These representations may be replaced by cognitive representations needed to perform the second task (Altmann & Trafton, 2002).

Studies have shown that there is a negative impact on primary task completion when the primary task is complex, such as flying an airplane (Dismukes, Loukopoulos, & Jobe, 1998). Other studies have shown that interruptions can actually be beneficial with regard to simpler tasks. In an early study performed by Zeigarnik (1929), interrupted simple tasks actually demonstrated better results in terms of recalled detail than those tasks that were not interrupted. This higher success rate can be explained by the brain’s need to keep the problem state. It is easier to make a quick mental reminder (problem state) with a simple task than it is with a more complex task. By causing the reminders to occur, the interruption actually leads to better recall and an improved performance.

Altmann and Trafton (2004) studied the effect of informing a user that an interruption is coming. Their study showed that simply informing the user that he or she *is going to be* interrupted had a positive impact on completion rate and decreased resumption lag. Therefore, giving the user the ability to “prepare to resume” the primary task after the secondary task has been completed has a positive effect on task completion (Altmann & Trafton, 2005).

The timing of an interruption has been studied and results have shown that the negative effects of interrupting users can be somewhat mitigated by deferring interruptions until a better time in the task sequence (Adamczyk, Iqbal, & Bailey, 2005). Salvucci and Bogunovich (2010) found that users are capable of handling the incoming alerts and the process of deferring a task. Users tend to choose to defer an interruption if they are at a point of high cognitive workload while working on the primary tasks (Salvucci & Bogunovich, 2010). While there has been some research in the area of deferred interruptions, specific measurements have not been made to actually examine if deferring an interruption actually benefited the user. These benefits could be shown by decreasing the time to complete a task or the number of errors in task completion.

Figure 1 (Appendix A) demonstrates the decision process that the user underwent during the experiments. The user is initially working on the

primary task and an alert about the secondary task appears. This alert tells the user that an interruption is coming and prompts the user to decide whether to postpone that interrupting secondary task or not. If the user accepts the interruption, then the secondary task will be completed. Following the secondary task, the primary task will be resumed and completed. If the user defers the interruption, the primary task is finished and then the secondary task is completed. If users were interrupted during a time of high cognitive workload, they would defer an interruption until they reached a point of lower mental workload (Salvucci & Bogunovich, 2010). The study showed that 94% of users opted to postpone an interruption during a time of high cognitive workload compared to 6% during a time of lower cognitive workload. When users have the ability to defer an interruption, they will concentrate on one task until mental workload decreases.

In addition to deferring an interruption, the effect of note taking on interruption and resumption lag has been studied. Parnin and DeLine (2010) examined 371 Microsoft programmers while they made changes to specific programs and were interrupted by another program. The programmers had to make changes to the second program before going back and finishing the first program. When the person was interrupted, they were given the chance to take down one note using the program or method of their choice. After both programs were changed, the programmers were asked about what they normally would do. Fifty-eight percent would take mental notes on where they were in the first program when interrupted (Parnin, & DeLine, 2010). Also, when resuming the first task 58% would normally read over the program and navigate to related code to jog their memory of where they were in the process (Parnin, & DeLine, 2010). Both of these methods are considered to increase lag time and, in turn, lessen the amount of work that can be done in a day.

To study how deferring interruptions or taking notes affected task performance, the following three experiments were conducted:

1. Experiment 1 replicates the Salvucci & Bogunovich 2010 study by looking at how many subjects switched from the primary task to the secondary task and at which cognitive load.

2. Experiment 2 investigates whether or not postponing the secondary task had a positive or negative impact on the completion of both the primary and secondary tasks and examined measures such as recall of detail, quality of task performance, total time (primary task and secondary task), interruption lag, resumption lag, and user satisfaction.
3. Experiment 3 examines whether being able to take a note about the primary task before being interrupted helped subjects perform the primary task better and reduced resumption lag.

3. METHODOLOGY

Experiment 1: Replicating Salvucci & Bogunovich

The first experiment was designed to verify the results of the 2010 Salvucci and Bogunovich study where each user was given the option to choose whether or not to postpone an interruption. The subjects were 33 college students divided into two separate groups. The first group was presented with a high-cognitive primary task: a list of 4 digit numbers (Figure 2) that they were asked to memorize in 20 seconds.

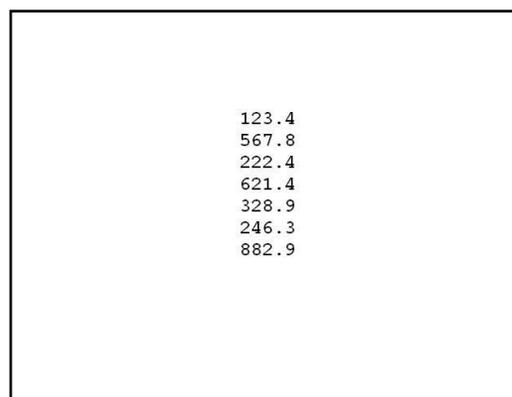


Figure 2: Experiment 1 Primary Task – High Cognitive

In the study by Salvucci and Bogunovich (2010), the high cognitive task was the memorization of the model number of a piece of hardware. For our study, the second group required a primary task involving a low cognitive workload to compare under what conditions a user will decide to defer the interruption. For their low-cognitive workload primary task, the users were presented with a number of different shapes of

varying size and they were asked to click on the shapes from smallest to largest (Figure 3).

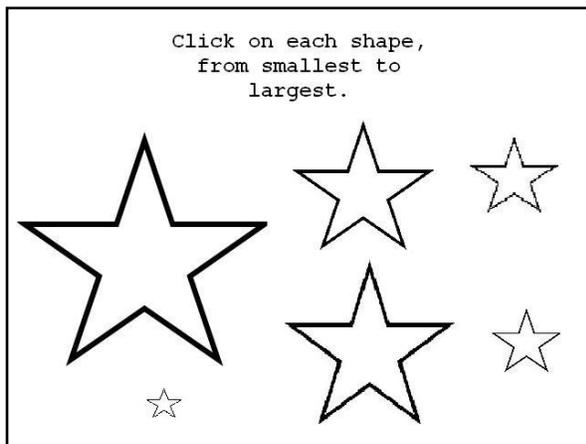


Figure 3: Experiment 1 Primary Task - Low Cognitive

In the middle of each subject's primary task, they were presented with an alert indicating that there was a secondary task that needed to be completed. The user then had the opportunity to choose whether or not to defer (Figure 4).

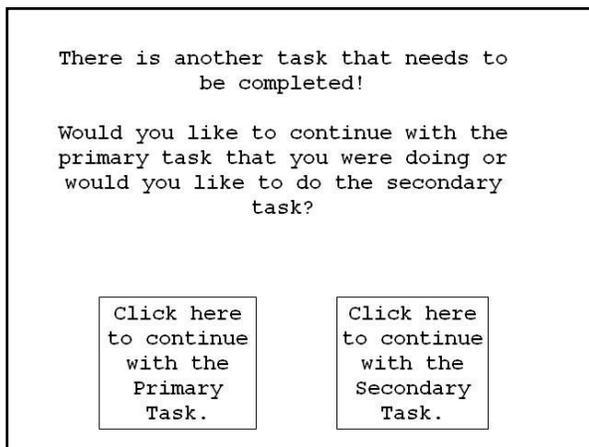


Figure 4: Decision Slide

The secondary task was a low cognitive task where users were presented with a random order of three colored boxes and they were asked to reproduce that sequence on the response slide (Figures 5 and 6).

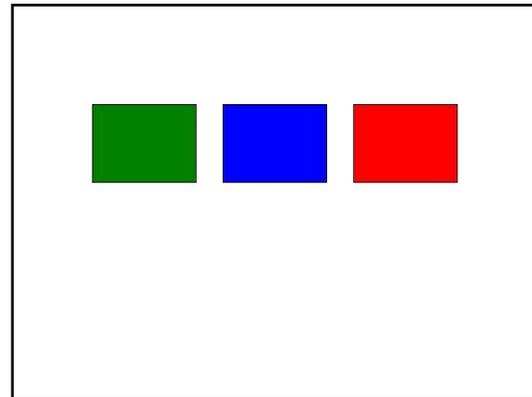


Figure 5: Experiment 1 Secondary Task Stimulus

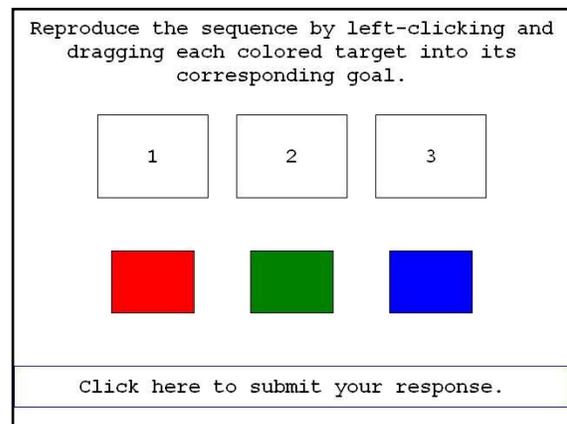


Figure 6: Experiment 1 Secondary Task Response Screen

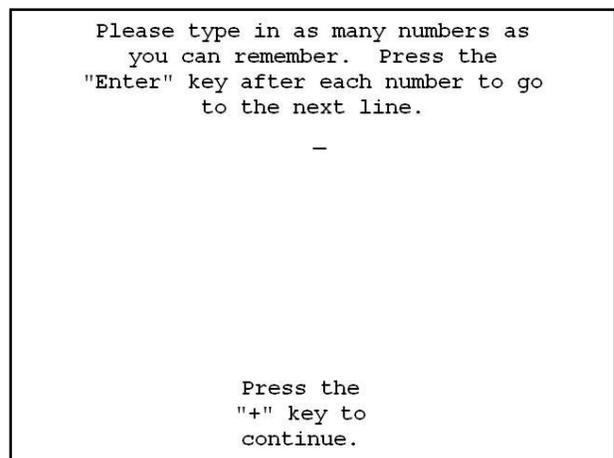


Figure 7: Memorizing Numbers Response Screen

After the subject made a decision at the decision slide, she would see one of two courses: 1) If the subject chose to continue with the Primary

Task, she would be directed to the respective response screen (Figures 7 and 8). After completing this screen, the subject would then complete the colored boxes task; or 2) If the subject chose to take the Secondary Task, she would be directed to the colored boxes task first, and then she would receive their respective response screen after the colored boxes task was finished. After the first experiment was conducted, each subject was asked to take a user satisfaction survey (Appendix B).

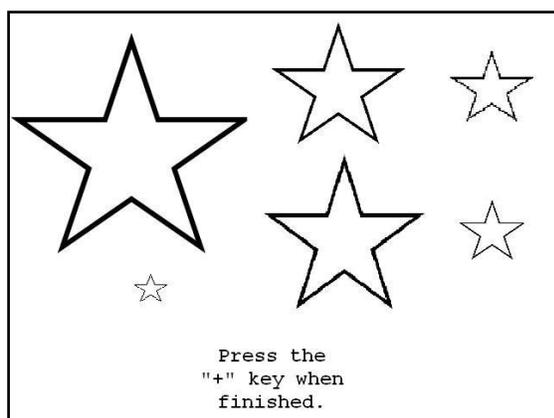


Figure 8: Clicking Stars Response Screen.

Experiment 2: Effects of Deferring an Interruption

Subjects were randomly assigned to one of three groups. The first group consisted of 11 subjects who were given the high cognitive task of memorizing numbers. While they were performing the primary task they were alerted about the secondary task, but were forced to complete the primary task. This group was known as the *Forced Primary Group*. The second group started the same high cognitive task and was also alerted about the secondary task, but this group was forced to complete the secondary task first before returning to the primary task. This group was known as the *Forced Secondary Group*. The third group was 11 subjects who started the same high cognitive task, finished it, and then moved on to complete the low cognitive task with no alert in between. This group was known as the *Control Group*.

In the second experiment, the same 33 college students were utilized as in the first experiment. The primary task for all users was the same in this experiment and the primary task involved a

high cognitive workload. The users were presented with a different list of four digit numbers and again asked to memorize as many as possible in 20 seconds, as seen in Figure 9.

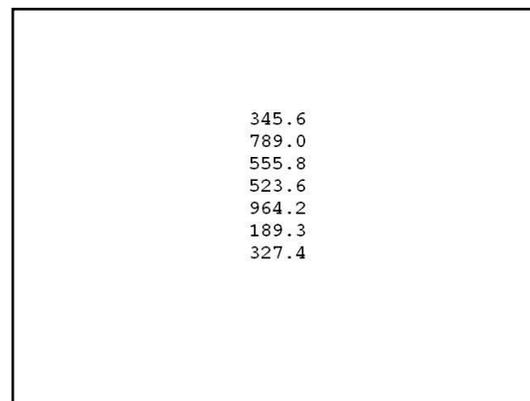


Figure 9: Experiment 2 Primary Task – High Cognitive

The low cognitive secondary task was the same colored boxes task described in Experiment 1. These three groups provided variation to investigate whether or not actually postponing the secondary task benefited the user. In the background during each experiment, E-Prime software was recording the total time to complete the tasks and measuring the resumption lag time. After the first experiment was conducted, each subject was asked to take a user satisfaction survey (Appendix B).

Several different resources were needed for the running and analysis of the experiments. The 33 subjects were recruited from the student population on campus for both experiments 1 and 2. These subjects were randomly assigned to one of the two conditions in experiment 1 and one of the three conditions in experiment 2. In addition, accurate mouse tracking software was utilized to accurately measure what the user does throughout the experiment and when it happens. E-Prime software was the chosen software for mouse tracking since it is a technology that is capable of tracking the cursor with millisecond accuracy. Millisecond measurements are necessary because the user made very quick decisions and this software helped to eliminate measurement errors in data collection during the experiments.

Experiment 3: Effects of Taking a Note

Forty students were tested to see how well they could retain memory of a primary task after being interrupted by a secondary task and if the process of taking a note would help their

performance. To examine if it is the process of taking a note or if the note itself is useful, some subjects were able to keep the note to use later while others were not.

The game of Simon was used for the primary task. The game starts by showing four lights in a pattern and requires the player to repeat the pattern. After each level of Simon the game gets harder by adding one light and gaining speed. The secondary task used the game of Concentration, which starts with a group of cards lying face down. Two cards are flipped at a time. When the two cards match, they are left face up. Subjects were randomly assigned into four groups: 1) Control group who went through the testing without interruption; 2) Group 2 who was interrupted, but not allowed to take a note; Group 3 who was interrupted and allowed to take one note down on a piece of paper when interrupted (The note could contain whatever they thought could help them when they returned to the task); and 4) Group 4 who was interrupted and allowed to take a note down when interrupted, but would not be able to use that note upon returning to the first task.

Subjects in groups 2-4 were told to stop after seeing the next color in the eighth level of Simon so that they could be interrupted with the secondary task (Concentration). At the end of each experiment subjects completed a survey.

4. RESULTS

Experiment 1: Replicating Salvucci & Bogunovich

The complete statistics from Experiment 1 can be seen in Appendix 3. A summary of the results is shown in Figure 10. These results show that of the 33 subjects that were run through the experiment, a total of six decided to switch tasks (move from working on the Primary Task to working on the Secondary Task). Of the six that decided to switch, five of the six switched when the Primary Task was the low cognitive Stars task versus only one subject who switched when the Primary Task was the high cognitive Numbers Task. The percentage of subjects that switched tasks when having a low cognitive task was 83% for this experiment, compared to 94% in the Salvucci and Bogunovich (2010) study. In addition, it can be seen that the Average Resumption Lag for the high cognitive Numbers Task was, on average,

almost 1.5 seconds higher than those subjects who did the low cognitive Stars Task.

For experiment 1, 95% confidence intervals were calculated to determine whether any of these measurements between groups were statistically different from each other. For Experiment 1 resumption lag, the high cognitive group had a confidence interval of (3.678, 5.286) seconds and the low cognitive group had a confidence interval of (1.950, 4.230) seconds. The confidence intervals for the other metrics, such as how many numbers were remembered correctly can be seen in the complete statistics in the appendices. Overall in all cases and all measurements, there appeared to be no statistical significance between the groups in for this experiment.

	# Users who switched tasks	Salvucci	Average Resumption Lag
Numbers Task (high-cognitive)	1/6 17%	6%	4.482 secs
Stars Task (low-cognitive)	5/6 83%	94%	3.090 secs

Figure 10: Experiment 1 – Notable Results

Experiment 2: Effects of Deferring an Interruption

The complete statistics from Experiment 2 can be seen in Appendix 4. A summary of the results is shown in Figure 11. Overall, it can be seen that the Forced Primary group took more time to complete both tasks, taking 106.99 seconds as opposed to 97 and 98 seconds for the other two groups. The Forced Primary group also had less resumption lag (3.14 seconds), compared to the other two groups (which had values over 4 seconds). Also, the Forced Secondary group, on average, remembered less of the numbers (1.78 numbers) than the Forced Primary or Control groups (2.00 numbers or higher).

	Total Time	Resumption Lag	Accuracy
Forced Primary	106.990 secs	3.141 secs	2.18 numbers
Forced Secondary	97.967 secs	4.194 secs	1.78 numbers
Control	97.246 secs	4.172 secs	2.00 numbers

Figure 11: Experiment 2 – Notable Results

In conducting the user satisfaction surveys after each experiment, the following can be seen. Most subjects in both experiments found the memorizing numbers task difficult or very difficult; 16/17 subjects in Experiment 1, and 26/32 subjects in Experiment 2. Most subjects also found the colored boxes task and the stars task to be easy or very easy (29/32 and 14/16 respectively). Most subjects indicated that they were either not very stressed (stars – 12/16) or moderately stressed (numbers – 8/17 subjects). In the open comments section of the surveys, some of the subjects indicated that they were more comfortable in the second experiment after having completed the first (5/33 subjects).

For experiment 2, 95% confidence intervals were calculated to determine whether any of these measurements between groups were statistically different from each other. For Experiment 2 resumption lag, the Forced Primary group had a confidence interval of (2.048, 4.234) seconds, the Forced Secondary group had a confidence interval of (2.928, 5.460) seconds, and the Control group had a confidence interval of (2.497, 5.847) seconds. The confidence intervals for the other metrics, such as how many numbers were remembered correctly can be seen in the complete statistics in the appendices. Overall in all cases and all measurements, there appeared to be no statistical significance between the groups for this experiment.

Experiment 3: Effects of Taking a Note

Each experimental group had 10 subjects randomly assigned to it. The Control Group was not interrupted, Group 2 was interrupted, Group 3 was interrupted, wrote a note and got to keep it and Group 4 was interrupted, wrote a note, but the note was taken away. The average level

finished for each of the groups is shown in Figure 12.

	Average level finished
Control	9.40
Group 2	11.40
Group 3	10.50
Group 4	9.50

Figure 12: Average level of Simon finished in Experiment 3

The group that performed the best was Group 2 who was interrupted but could not take or use a note.

5. DISCUSSION

Overall, Experiment 1: Replicating Salvucci & Bogunovich ended up being close to the Salvucci and Bogunovich study comparing the 94% of their study to the 83% of this study. This difference can be attributed to individual user differences and also the number of subjects tested. All three studies had a small number of subjects. An experiment on a larger scale would be more indicative of the actual results. Also, the ability to postpone a task appeared to increase accuracy and lessen resumption lag, but the statistical analysis makes this look less definitive. Also, the results were less definitive on the overall time metric because it took users slightly more time when given the decision slide, about 107 seconds vs. the 97 seconds of the other groups.

The user satisfaction survey results indicate that the cognitive level of the tasks desired matched the actual cognitive level that the subjects experienced. Also, because the same subjects were used, many subjects may have been influenced in Experiment 2 after having completed Experiment 1.

The results in Experiment 3 were totally opposite of that predicted by the prior research. In Parnin, & DeLine 's (2010) study of Microsoft programmers, the programmers were being interrupted by the same type of task (programming with programming), where in Experiment 3, a visual/auditory task (Simon) was interrupted by a visual task (Concentration). Individual differences and experimental flaws may also to be responsible due to cognitive or physical differences of the subjects. It would be worth examining these differences further.

6. CONCLUSIONS

Overall, computer users have shown a great interest in having the ability to postpone interrupting tasks. Giving control to the user has a strong potential to limit any negative impact of the interruptions. Also, interrupting at more appropriate cognitive levels appears to be a key indicator of how willing a user is to accept an interrupting task. Ultimately, utilizing these postpone options could save significant time and money.

To get more definitive results with regard to interruptions, a study with more subjects would be ideal. Also, investigating the Experiment 2 metrics more carefully would be very important to see if it is worth implementing these postpone options to software. It would also be interesting to look at self-interruptions because they are a different brand of interruptions that were not even considered in this study. In addition, it took the users only a few minutes to complete the tasks described above, so running a study with a longer-term task would definitely be an important and interesting consideration in conducting future research.

7. BIBLIOGRAPHY

Adamczyk, Piotr D., Shamsi T. Iqbal, and Brian P. Bailey. "A Method, System, and Tools for Intelligent Interruption Management." *ACM*. N.p., 2005. Web. 18 Oct. 2010.

Altmann, E. M., & Trafton, J. G. (2004). Task interruption: resumption lag and the role of cues. *Cognitive Science*, 2004, 43-48. Retrieved 09-14-2010.

Altmann, E. M. & Trafton, J. G. (2002). Memory for goals: An activation-based model. *Cognitive Science*, 26, 39-83

Dismukes, R. Key, Loukia D. Loukopoulos, and Kimberly K. Jobe. "The Challenges of Managing Concurrent and Deferred Tasks." *ACM*. N.p., 1998. Web. 18 Oct. 2010.

Gonzalez, V. & Mark, G. (2004). 'Constant, constant, multi-tasking craziness: managing multiple working spheres.' *Proceedings of ACM CHI '04*, 113-120.

Jin, Jing, and Laura A. Dabbish. "Self-Interruption on the Computer: A Typology of Discretionary Task Interleaving." *ACM*. N.p., 2009. Web. 31 Oct. 2010.

Mark, G., Gonzalez, V, & Harris, J. (2005). 'No task left behind? Examining the nature of fragmented work.' *ACM CHI 2005*, 321-330.

McFarlane, D.C. & Latorella, K. A. (2002). "The scope and importance of human interruption in human-computer interaction design." *Human-Computer Interaction*, 2002, Vol. 17, pp 1-61.

Parnin, C, & DeLine, R. (2010). Evaluating cues for resuming interrupted programming tasks. *Chi 2010: Multitasking*, 93-102.

Salvucci, Dario D., and Peter Bogunovich. "Multitasking and Monotasking: The Effects of Mental Workload on Deferred Task Interruptions." *ACM*. 2010. Web. 18 Oct. 2010.

Zeigarnik, B. (1927, 1938). On finished and unfinished tasks. In W.D. Ellis (Ed.), *A source book of Gestalt psychology* (pp. 300-314). New York: Harcourt Brace.

Appendix A

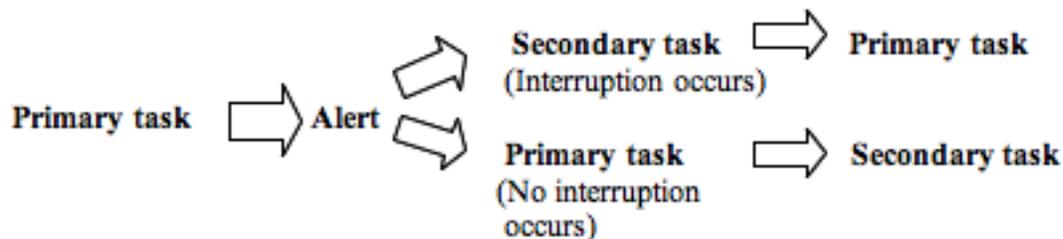


Figure 1: Sequence of events

Appendix B : Interruptions and the Effects of Postponement of a Secondary Task: Experiment 1

Subject #: _____

Please rate the following on their level of difficulty:

Task	Very Difficult	Difficult	Neither Difficult nor Easy	Easy	Very Easy
Experiment 1: The Primary Task Please circle one: (memorizing numbers) (clicking stars)					
Experiment 1: The Secondary Task (ordering the boxes)					

In the first experiment, why did you choose to postpone the primary task? (or why didn't you choose to postpone the primary task?)

During the first experiment primary task, how many digits did each number have? Or how many stars were there on the screen?

Please rate the following on your experience during the experiment using the scale from 1 to 5:

I felt stressed.	Not Very	1	2	3	4	5	Very	
The amount of time to do the primary task.				Not enough			Plenty of time	
				1	2	3	4	5
It was easy to remember the numbers				Difficult			Easy	
				1	2	3	4	5

Additional Comments:

Appendix C Interruptions and the Effects of Postponement of a Secondary Task Experiment 2

Subject #: _____

Please rate the following on their level of difficulty:

Task	Very Difficult	Difficult	Neither Difficult nor Easy	Easy	Very Easy
Experiment 2: The Primary Task (memorizing numbers)					
Experiment 2: The Secondary Task (ordering the boxes)					

How well do you think you correctly memorized the numbers? How many do you think you remembered?

During the second experiment primary task, how many digits did each number have?

Please rate the following on your experience during the experiment using the scale from 1 to 5:
 Not Very

I felt stressed.	Not Very	1	2	3	4	Very	5
The amount of time to do the primary task.				Not enough			Plenty of time
				1	2	3	4 5
It was easy to remember the numbers				Difficult			Easy
				1	2	3	4 5
I was frustrated that I was forced to postpone or not postpone				Not Very			Very
				1	2	3	4 5

Additional Comments

Appendix D

Subject #	1st Experiment Total Time	Decision	Resumption Lag	Numbers Accuracy (out of 7)	Stars Accuracy (of 6)	Boxes Accuracy (of 2)
NumbersBoxes Tasks						
1	124326	Primary	4220	4		1
3	123790	Primary	4004	3		1
5	110341	Primary	6404	2		1
7	200015	Primary	5341	1		1
9	121633	Primary	4229	4		2
11	107115	Primary	2809	3		0
13	165277	Primary	5154	3		0
15	131839	Primary	2681	2		1
17	129133	Primary	3841	4		2
19	142866	Primary	3815	3		1
21	140525	Primary	5855	5		2
23	112859	Primary	2999	3		0
25	113195	Primary	3167	3		1
27	113355	Secondary	2583	2		1
29	152743	Primary	4091	3		2
31	119161	Primary	5787	2		0
33	122484	Primary	9219	3		2
Average	131215.12	94.12%	4482.29	2.94		1.06
Standard Deviation	23713.617		1692.962	0.966		
Confidence Interval	11272.53 (119942.59, 142487.65)		804.77 (3678, 5286)			
StarsBoxes Tasks						
2	77673	Secondary	1640		6	2
4	120454	Primary	4889		6	1
6	84743	Secondary	8968		6	0
8	100523	Primary	7744		6	0
10	73416	Primary	1128		6	1
12	72097	Secondary	1384		6	2
14	85570	Primary	1600		6	1
16	97892	Primary	2488		6	1
18	87194	Primary	2392		6	2
20	51896	Secondary	2312		6	2
22	99879	Primary	2169		6	0
24	75276	Secondary	1376		6	1
26	83475	Primary	1417		6	0
28	86221	Primary	4192		6	0
30	103521	Primary	2040		6	0
32	99653	Primary	3712		6	1
Average	87467.69	68.75%	3090.69		6.00	0.88
Standard Deviation	16123.808		2327.704			
Confidence Interval	7900.520505 (79567, 95367)		1140.554218 (1950, 4230)			

Appendix E

Subject #	2nd Experiment Total Time	Decision	Resumption Lag	Numbers Accuracy (out of 7)	Boxes Accuracy (of 2)
ForcedPrimary Tasks					
1	116017	ForcedPrimary	1948	4	2
4	121242	ForcedPrimary	6516	1	1
7	114149	ForcedPrimary	3309	1	1
10	135443	ForcedPrimary	6794	1	2
13	123329	ForcedPrimary	2081	4	2
16	105529	ForcedPrimary	2273	2	2
19	93776	ForcedPrimary	1111	2	2
22	101009	ForcedPrimary	2750	4	2
28	100066	ForcedPrimary	3147	1	2
29	81618	ForcedPrimary	1795	3	2
31	84722	ForcedPrimary	2827	1	2
Average	106990.91		3141.00	2.18	1.82
Standard Deviation	16770.374		1850.612	1.328	
Confidence Interval	9910.475343 (97080, 116900)		1093.621904 (2048, 4234)	0.784795078 (1.40, 2.96)	
ForcedSecondary Tasks					
2	88554	ForcedSecondary	3133	2	1
5	88622	ForcedSecondary	6228	1	2
8	141674	ForcedSecondary	3199	2	2
14	106624	ForcedSecondary	3074	3	2
17	80678	ForcedSecondary	2250	2	2
20	115405	ForcedSecondary	7958	2	2
25	90591	ForcedSecondary	2287	3	2
26	90368	ForcedSecondary	4495	0	1
32	79194	ForcedSecondary	5123	1	2
Average	97967.78		4194.11	1.78	1.78
Standard Deviation	20089.637		1937.925	0.972	
Confidence Interval	13124.98841 (84843, 111091)		1266.087702 (2928, 5460)	0.634914206 (1.15, 2.41)	
Control					
3	87250	None	2484	3	1
6	97865	None	1838	2	2
9	121011	None	4679	2	2
12	71063	None	3205	2	2
15	88038	None	5485	3	2
18	87067	None	2991	1	2
21	139622	None	11525	3	1
24	93178	None	2719	1	2
27	99020	None	6336	1	1
30	92467	None	2527	1	1
33	93132	None	2112	3	2
Average	97246.64		4172.82	2.00	1.64
Standard Deviation	18423.388		2835.809	0.894	
Confidence Interval	10887.32626 (86359, 108133)		1675.824948 (2497, 5847)	0.52856298 (1.47, 2.53)	