The Impact of Texting Interruptions on Task Performance

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Abstract. Texting has become ubiquitous in today's society. The high rate of cellular and wireless coverage across the globe coupled with the ease and low cost of some smartphones has made staying in touch easy—some might say too easy. Texting apps allow people to communicate with friends and family whenever and wherever they want, but these interruptions are not always at opportune moments and can be distracting. This paper discusses preliminary results of ongoing research into the effects of texting on task performance. In particular, data was collected using three treatment groups (zero, three, and six text messages). via WhatsApp during a reading comprehension task. The results reveal that high levels of interruptions affect task performance.

Keywords: Social media · WhatsApp · Texting · Task performance

1 Introduction

Interruptions due to social media notifications and texting have become a way of life for many, especially the youth of today. A survey of Johnson & Wales University found interesting results on student texting behavior. The sample (N = 48) consisted of

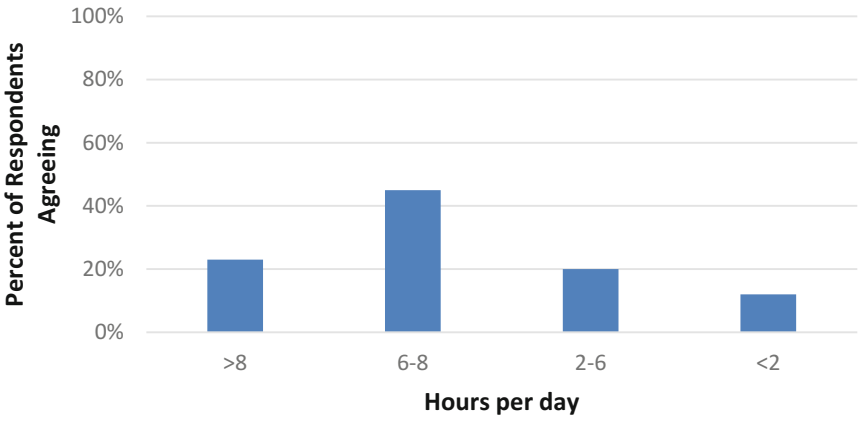

Fig. 1. Hours per day checking social media by college students

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males (n = 26) and females (n = 22) who were administered a student perception questionnaire on how social media affects college students. The results of the survey questionnaire indicated that 45% of the people admitted that they spent 6–8 h per day checking social media sites, while 23% spent more than 8 h; 20% spent 2 to 4 h and only 12% spent less than 2 h on this task (see Fig. 1, [1]).

Therefore, understanding the impact of these frequent interruptions presented via social media in our daily lives is worthy of further investigation. The purpose of this research is to investigate the impact such interruptions have on a person's task performance.

2 Literature Review

Previous research has established the significance of interruptions on work performance. Some researchers worked on the impact on performance due to different types of tasks; other researchers worked on the impact on performance due to different types of interruption.

In particular, Baron [2] clarified the definition of simple tasks, which referred to well-learned tasks such as simply to write numbers as they appeared on the page (number copying); while complex and counter instinctual tasks are more difficult such as reverse letter copying.

Speier et al. [3] investigated the effects of interruptions on decision-making performance with college level coursework in different information-presenting modes. They revealed that interruptions facilitate performance of simple tasks but impede performance of complex tasks. For simple tasks, interruptions focus a decision maker's attention on important cues resulting, in general, in both increased decision accuracy and shorter decision time.

Payne [4] found that simple tasks require processing fewer cues (pieces of data) than complex tasks. Therefore, decision makers have ample cognitive resources to process simple tasks when interruptions occur and therefore do not need to change the way in which they process information. On the other hand, when processing complex tasks, decision makers minimize their expenditure of scarce cognitive resources, uncritically examining both relevant and irrelevant cues [2]. In addition, when performing simple tasks, individuals may perceive that the task "is too easy" and therefore do not dedicate their full attention and processing capabilities to performing the task at hand. Instead, they may think about other work-related (e.g., creative problem-solving on another task, creating a mental "to do" list) or personal issues.

Lee and Duffy [5] indicated that interruption frequency was also limited to three times per task because task performance had not changed significantly at more than three times per task and subjects showed unintended annoyance, which can possibly affect the task performance. In the pilot experiment, more than three interruptions per task was also tested, but too many interruptions in a task resulted in a severe decrease in task performance due to frustration and lack of motivation, not due to the effects of interruptions.

3 Research Question and Model

This research focuses on the question: *How does texting affect performance?* Based on previous research, the research model (see Fig. 2) shows texting frequency as a mediator. Task (reading) performance is thought to decrease as the number/frequency of interruptions of texting increases.

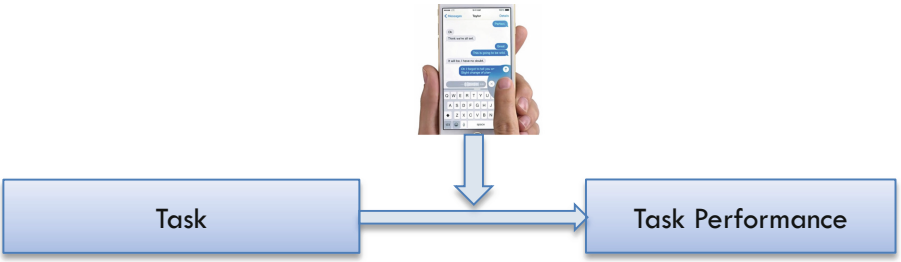


Fig. 2. Research model

4 Research Method

Since the study was looking at the impact of different levels of interruptions presented via a social media app, in this case WhatsApp, on reading comprehension/performance, a controlled lab environment was chosen. Participants were randomly assigned to one of three groups as they registered for the study. Each group received a different number of interruptions (0 for the control group, 3 messages for treatment group 1, and 6 messages for treatment group 2) (see Table 1).

Table 1. Treatment groups

Group	Treatment description	No. of subjects
1. Control	**No level of interruption:** received 0 message interruptions	39
2. Treatment 1	**Low level of interruption:** received 3 message interruptions	29
3. Treatment 2	**High level of interruption:** received 6 message interruptions	35

Upon entering the lab, all subjects were told to take a seat wherever they felt comfortable. Researchers ensured that the subject had WhatsApp on their cell phone and felt comfortable using it (see Fig. 3). The researcher then asked the participant for their WhatsApp name to add to the group texts. They were told to attend to any texts they received from WhatsApp while performing the task (see Fig. 4).

4.1 Sample

The overall sample consisted of 103 college students from a Chilean university. The students consisted of 57 males and 46 females. Their average age was 20.19. Subjects'

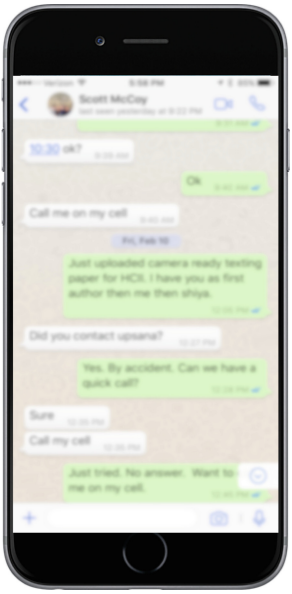


Fig. 3. WhatApp screen sample

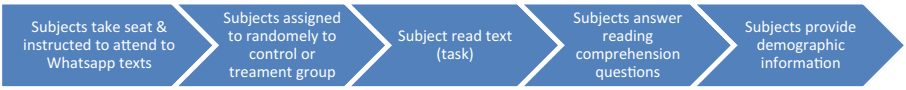


Fig. 4. Study procedure

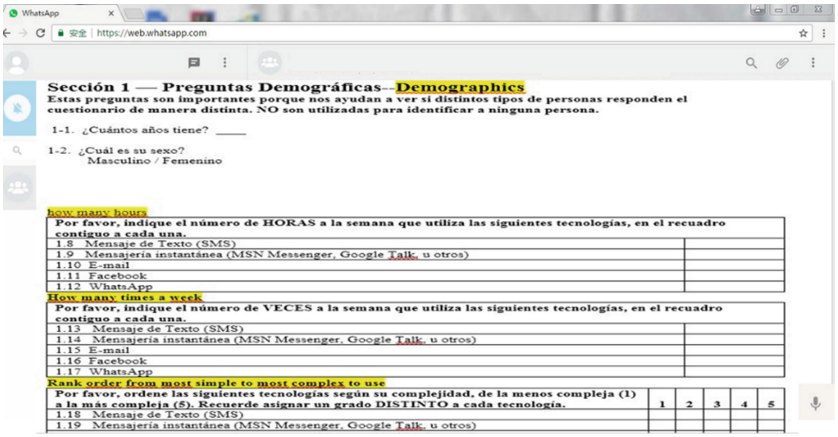
average number of hours spent per week using different social media apps were as follows: 0.10 h for Text messaging, 3.65 h for Instant messenger, 3.77 h for Email, 14.40 h for Facebook, and 23.04 h for WhatsApp (see Table 2).

Table 2. Demographic information

Gender	Male = 57
	Female = 46
Age	Average = 20.19
Average hours per week using:	
Text messaging	0.10
Instant messenger	3.65
Email	3.77
Facebook	14.40
WhatsApp	23.04

4.2 Task

After all subjects were seated, the researchers gave the subjects the study website address and provided further instructions. The subjects were given a survey site URL, where they would first answer several questions regarding their social media usage (see Fig. 5). They would then answer specific questions related to their experience with WhatsApp (see Fig. 6). Once all had completed the preliminary questions, the group was instructed to start reading a passage on the "No Smoking Law" and answer comprehension questions (see Fig. 7) related to the reading based on their memory. (They were not able to refer back to the passage).



Sección 1 — Preguntas Demográficas—Demographics

Estas preguntas son importantes porque nos ayudan a ver si distintos tipos de personas responden el cuestionario de manera distinta. NO son utilizadas para identificar a ninguna persona.

1-1. ¿Cuántos años tiene? ____

1-2. ¿Cuál es su sexo?
Masculino / Femenino

how many hours

Por favor, indique el número de HORAS a la semana que utiliza las siguientes tecnologías, en el recuadro contiguo a cada una.	
1.8 Mensaje de Texto (SMS)	
1.9 Mensajería instantánea (MSN Messenger, Google Talk, u otros)	
1.10 E-mail	
1.11 Facebook	
1.12 WhatsApp	

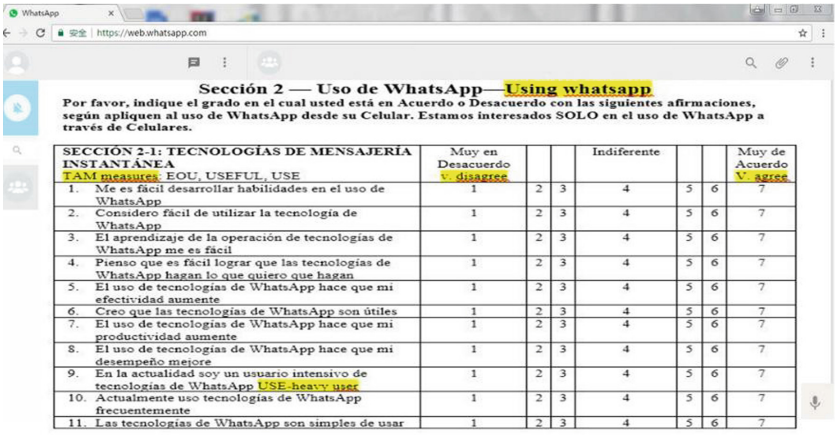
How many times a week

Por favor, indique el número de VECES a la semana que utiliza las siguientes tecnologías, en el recuadro contiguo a cada una.	
1.13 Mensaje de Texto (SMS)	
1.14 Mensajería instantánea (MSN Messenger, Google Talk, u otros)	
1.15 E-mail	
1.16 Facebook	
1.17 WhatsApp	

Rank order from most simple to most complex to use

Por favor, ordene las siguientes tecnologías según su complejidad, de la menos compleja (1) a la más compleja (5). Recuerde asignar un grado DISTINTO a cada tecnología.	1	2	3	4	5
1.18 Mensaje de Texto (SMS)					
1.19 Mensajería instantánea (MSN Messenger, Google Talk, u otros)					

Fig. 5. The question sample of social media usage



Sección 2 — Uso de WhatsApp—Using whatsapp

Por favor, indique el grado en el cual usted está en Acuerdo o Desacuerdo con las siguientes afirmaciones, según apliquen al uso de WhatsApp desde su Celular. Estamos interesados SOLO en el uso de WhatsApp a través de Celulares.

SECCIÓN 2-1: TECNOLOGÍAS DE MENSAJERÍA INSTANTÁNEA TAM measures: EOU, USEFUL, USE	Muy en Desacuerdo V. disagree			Indiferente			Muy de Acuerdo V. agree
1. Me es fácil desarrollar habilidades en el uso de WhatsApp	1	2	3	4	5	6	7
2. Considero fácil de utilizar la tecnología de WhatsApp	1	2	3	4	5	6	7
3. El aprendizaje de la operación de tecnologías de WhatsApp me es fácil	1	2	3	4	5	6	7
4. Pienso que es fácil lograr que las tecnologías de WhatsApp hagan lo que quiero que hagan	1	2	3	4	5	6	7
5. El uso de tecnologías de WhatsApp hace que mi efectividad aumente	1	2	3	4	5	6	7
6. Creo que las tecnologías de WhatsApp son útiles	1	2	3	4	5	6	7
7. El uso de tecnologías de WhatsApp hace que mi productividad aumente	1	2	3	4	5	6	7
8. El uso de tecnologías de WhatsApp hace que mi desempeño mejore	1	2	3	4	5	6	7
9. En la actualidad soy un usuario intensivo de tecnologías de WhatsApp USE-heavy user	1	2	3	4	5	6	7
10. Actualmente uso tecnologías de WhatsApp frecuentemente	1	2	3	4	5	6	7
11. Las tecnologías de WhatsApp son simples de usar	1	2	3	4	5	6	7

Fig. 6. The question sample of experience with WhatsApp

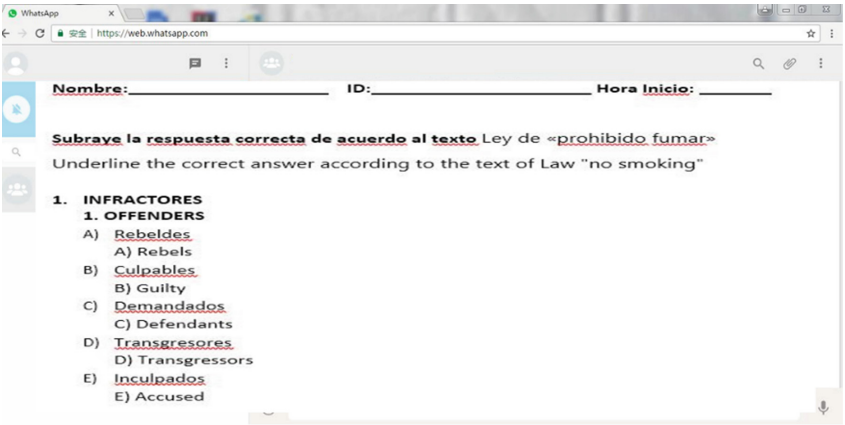


Fig. 7. The question sample of reading task

During the time that students were reading the passage, they were sent text messages through WhatsApp. They were not required to respond, but were simply asked to read them. The interruptions (see Fig. 8) were spaced equally—approximately 1 min apart. As seen in Table 3, the minimum time for completing the task was five minutes, while the maximum time was 18 min.

We removed outliers of those with no value of time-taking and with very high score of performance as well.

After completing the reading task, the subjects were asked to rate: (1) how mentally demanding the task was, (2) how much time pressure they felt, (3) how well they feel they met the objective of the task, (4) how much they felt insecure, discouraged, irritated, tensed, or worried during the task (see Fig. 9). Next, in order to understand how they perceived interruptions, they were asked if they were interrupted during the

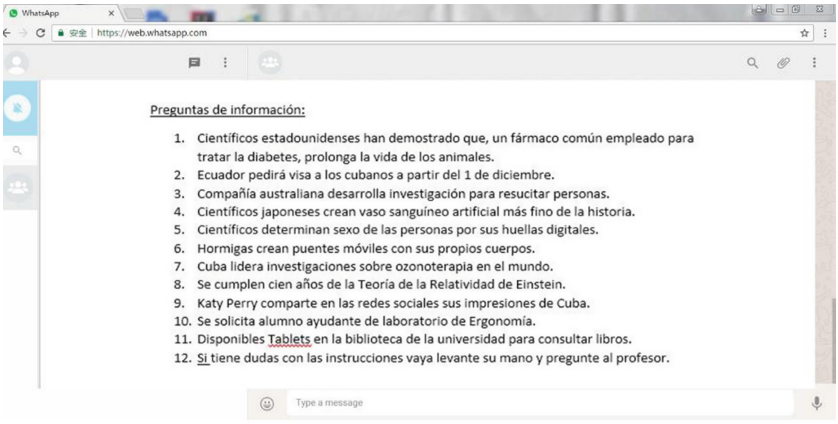


Fig. 8. WhatsApp interruption text

task. If they were, they were asked to state the number of times they believed they had been interrupted and what those interruptions were. Finally, the subjects were thanked for their participation and left the lab (Table 4).

Table 3. Task completion (time)

Treatment	Minutes			
	Mean	Max	Min	Median
No interruption	8.8	11	5	9
3 messages	11.74	18	6	12
6 messages	9.97	15	5	10

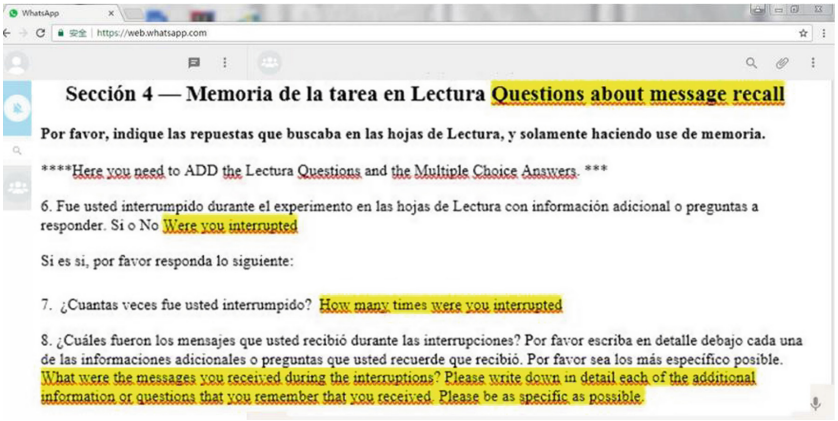


Fig. 9. The question sample after completing reading task

Table 4. Task completion (reading comprehension score)

Treatment	Mean	Std. deviation
No interruption	4.11	1.30
3 messages	4.62	0.81
6 messages	3.90	1.21

5 Results

The result of research indicated that values of scores differ statistically between the groups receiving 3 messages and 6 messages; values of scores also differ statistically between the groups receiving 3 messages and 0 messages; while values of scores do not differ statistically between the groups receiving 6 messages and 0 messages (Table 5).

Table 5. Treatment T-test results

Treatment comparison	T-value	P-value
0 to 3 messages	−2.007	0.048*
3 to 6 messages	2.933	0.005*
0 to 6 messages	0.689	0.493

*Significant at .05

6 Discussion

We assumed a negative relationship between frequency of texting and reading performance. The preliminary results showed that the performance of people receiving 3 messages was statistically better than those receiving 6 messages and receiving 3 messages was statistically better than that receiving 0 message. The reason behind people receiving 3 messages to perform statistically better than those receiving 6 messages is that more than three interruptions per task resulted in a severe decrease in task performance due to frustration and lack of motivation [5]. The reason behind people receiving no messages to not perform better than those receiving 3 messages is that interruptions facilitate performance on simple tasks and inhibit performance on complex tasks; while too simple tasks distract people's attention so that the performance is not going well [4].

7 Conclusions and Future Research

7.1 Conclusions

Based on the above analysis, preliminary results indicated that low frequency of interruptions facilitate performance, while high frequency of interruptions impede performance. Interruptions such as texting do affect students' reading performance (Table 6).

Table 6. Preliminary research implications

Interruptions	Performance
Low frequency and simple interruptions	↑
High frequency and complicate interruptions	↓

7.2 Future Research

In our future research, we want to work on several parts. First, we want to investigate focus group. We'll pick out focus group to investigate them, including picking out people who did very well and did very poorly in the test, also some middle of the road.

Second, we want to conduct more dependent variables analysis. These variables may include number of hours a week using WhatsApp, complexity using WhatsApp, difficulty of the reading task, etc.

Third, we want to see the impact of frequency of texting on a broader range of tasks (such as more complicated tasks) and the impact on performance with a time lag as well.

Third, we want to do more complex tests, such as not just texting messages but also texting questions that need to be answered and not only looking at reading performances but also looking at writing performances and other study performances.

Fourth, we want to expand the range of subjects. We are considering to do future research in group work, different age groups, and diverse cultural environment, etc. Also, variability of impact on performance in a variety of work settings and a variety of work tasks vs academic setting/tasks is worth to study on.

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