



Texting as a distraction to learning in college students



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ABSTRACT

Texting has been shown to be cognitively distracting for students in lecture settings, but few have done empirical work, or looked at moderating effects between texting and academic outcomes. This experimental study compared the proportion of correct answers on a lecture quiz between students who were randomly assigned to text message during a pre-recorded lecture and those who were not, while investigating possible moderators. The participants who text messaged throughout the lecture scored significantly lower in percent of correct responses ($t(95) = -4.6, p < .001, d = .93$). No moderating effects were found, including: perceived distraction, perceived texting ability, number of text messages sent and received during the lecture, age, and gender.

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1. Introduction

1.1. Text messaging

Text messaging, or texting, is a mode of conversation in which the sender types in a message typically of less than 160 characters on a mobile phone or other unit and sends it to a mobile receiver, regardless of the location or provider of the recipient. Texting has become ubiquitous through the adolescent and young adult generations (Faulkner & Culwin, 2005), with cell phone users between the ages of 18–34 sending upwards of 2000 text messages a month (Nielsen, 2011). Texting is often cited as the preferred method of conversation for college students, over phones or e-mail (Bryant, Sanders-Jackson, & Smallwood, 2006; Skierkowski & Wood, 2012; Van Cleemput, 2012). They use texting to update plans in real time, and to discuss private activities for which an audible conversation may not be appropriate (Grinter, Palen, & Eldridge, 2006), saving phone conversations for longer discussions about recent life events (Madell & Muncer, 2007). According to Harrison and Gilmore (2012), college students also self-report texting during work hours, while taking a shower, during religious services, and even while having sex.

1.2. Texting as a distraction

One additional inopportune area for texting is the classroom setting. Wei and Wang (2010) recently found that students who

are habitual texters in general are more likely to text in class. Some studies suggest technology usage during academic settings may be inhibitory to learning. For example, instant messaging on a computer, which has similar qualities to texting, has been shown to be correlated with academic distractibility (Levine, Waite, & Bowman, 2007), increased reports of academic impairment, and decreased homework completion (Junco & Cotten, 2010). Researchers have also found that using social technology such as texting or instant messaging during a simulated classroom environment can lead to lower recall (Wood et al., 2012). In addition, GPA and texting while studying are negatively correlated (Windham & B., 2008). Students who used instant messaging while reading a passage took longer to finish the passage than those who did not use instant messaging, even after removing the time taken to read and send the messages. However, there were no statistical differences on a following exam over the read passage. The researchers attributed this to the fact that the entire article was read by both groups, even though the instant messaging group took longer to do so (Bowman, Levine, Waite, & Gendron, 2010).

In a lecture environment, the student does not have the option to 'pause' the instructor while he or she texts, indicating that the students must multi-task. Research has found that multitasking leads to less productive, lower quality, less efficient work (Junco & Cotten, 2010; Mayer & Moreno, 2003; Meyer & Kieras, 1997). Students on computers will often multitask (Judd & Kennedy, 2011), using their laptops for things other than note taking, which can lead to distractions and lower test scores (Fried, 2008), especially when the devices are used for social interactions during class (Junco, 2012). Other studies have also shown that laptop usage can decrease student satisfaction, and does not statistically increase GPAs (Wurst, Smarkola, & Gaffney, 2008). Students in

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online classroom environments also report multitasking on the computer to be both distracting and challenging (Winter, Cotton, Gavin, & Yorke, 2010).

Texting acts as a distracter to attention in non-academic settings, such as driving, and divided attention in a classroom environment will limit learning (Horrey, Wickens, & Consalus, 2006; Kass, Cole, & Stanny, 2007; Strayer & Johnston, 2001). Therefore, texting should act as a distraction to limit learning in a lecture setting. In a recent survey, Wei, Wang, and Klausner (2012) found that students who reported texting during a lecture had lower levels of sustained attention, and therefore lower academic performance than those who did not text. However, this study used self-reported measures. Perhaps students who chose to text during a lecture already have lower sustained attention, and this is what is driving the lower academic performance.

Previous studies have found that students believe that texting is distracting in general, but yet they still choose to text during lectures (Harrison & Gilmore, 2012; Skierkowski & Wood, 2012; Wood et al., 2012). One reason for this may be linked to an attribution bias in which students believe that their texting abilities can overcome the distraction within a lecture. Many cultural myths circulate concerning multitasking, including the idea that multitasking can make an individual more productive (Ophir, Nass, & Wagner, 2009). Other studies have found that experienced drivers are less distracted by cell phones and other secondary tasks than novice drivers (Nabatiilan, Aghazadeh, Nimbarte, Harvey, & Chowdhury, 2012; Patten, Kircher, Östlund, Nilsson, & Svenson, 2006). Therefore, looking at possible moderators to texting and distraction should also be a focus of research.

The main purpose of this study is to examine whether texting distracts students in a lecture setting, using a quasi-experimental design. This study has two main hypotheses, as follows:

1. Participants assigned to the texting group will have a lower percentage of correct answers on a recall quiz, compared to those assigned to the control group.
2. For the texting group, perceived distraction and texting ability will moderate the effect of texting on quiz performance.

Table 1
Survey results: descriptive statistics.

| Question | <i>n</i> | Mean | <i>SD</i> |
|--|-----------|------------|-----------|
| 1. I text message while in class | 99 | 2.47 | 0.82 |
| 2. I use secret methods, such as hiding my phone under my desk, to hide my text messaging | 99 | 2.53 | 0.91 |
| 3. I find myself distracted by my text messages while in class | 98 | 1.99 | 0.70 |
| 4. I follow classroom text messaging policies | 99 | 2.08 | 0.91 |
| 5. I am distracted, annoyed, or bothered by other's text messaging in the classroom | 98 | 1.41 | 0.63 |
| 6. I miss lecture points or notes because of my text messages | 98 | 1.67 | 0.65 |
| 7. The instructor notices my text messaging | 99 | 1.41 | 0.54 |
| 8. I get frustrated when trying to send text messages because of my lack of skill. | 98 | 1.23 | 0.57 |
| 9. Other classmates are bothered, annoyed or distracted by my text messaging | 99 | 1.19 | 0.39 |
| 10. The instructor feels disrespected, frustrated, or annoyed because of my text messaging | 99 | 1.51 | 0.78 |
| 11. I am often bored in class if I do not text message | 98 | 2.09 | 0.90 |
| 12. I can send an accurate text message without looking at the keys of my mobile device | 99 | 2.55 | 0.98 |
| 1. Text messaging in the classroom is distracting to the user | 99 | 3.66 | 1.05 |
| 2. Administration should be concerned about text messaging | 99 | 2.70 | 1.23 |
| 3. Students should be allowed to text message in class | 99 | 3.32 | 1.26 |
| 4. Text messaging does not bother anyone else in the classroom except the user. | 99 | 3.20 | 1.35 |
| 5. Administration places unfair emphasis on text messaging in class | 98 | 2.70 | 1.10 |
| 6. Text messaging in the classroom is disrespectful to the instructor | 97 | 3.81 | 1.01 |
| 7. I am good at text messaging | 98 | 4.28 | 1.00 |
| 8. University policies about text messaging are useful and effective | 99 | 2.81 | 1.09 |
| Age started text messaging | Frequency | Percentage | |
| Younger than 13 years | 3 | 3.1 | |
| Between 13-15 | 31 | 31.6 | |
| Between 16-18 | 45 | 45.9 | |
| Above 18 | 14 | 14.3 | |

2. Method

2.1. Participants

Participants ($N = 99$) were selected from an online sign up process as a part of an introduction psychology undergraduate class. The ages ranged from 18 to 56 years, with a mean age of 20.33 years ($SD = 5.17$). One participant's data from the initial 100 was deleted because the participant was under the age of 18. The sample was ethnically diverse, with the following breakdown: African American (35.7%), White, non Hispanic (34.7%), Asian, all groups (15.3%), and Hispanic/Latino (6.1%), and Other (8.2%). Eighty percent of the sample was female, and most were either in their freshman (49%) or sophomore (21.4%) year. The participants had a mean self-reported grade point average of 3.30 ($SD = 0.45$), and all participants reported previously taking three or fewer psychology college courses. Eighty percent of participants reported texting before the age of 18, although one participant had never sent a text message prior to the study.

2.2. Measures

A pre-recorded psychology lecture was used to simulate a lecture setting. The information presented in the lecture was not information that would be presented in the introduction to psychology class, but was intended for lower-division college students. A pre-recorded lecture was chosen because the participants attended the study sessions 25 at a time, and the lecture needed to be the same for all four study timeslots.

A multiple choice quiz was constructed based on the pre-recorded lecture used during the study. This quiz had seventeen overall questions, each with one correct answer that had been presented in the lecture. The percentage of correct answers was used to gauge the participants' performance on the quiz.

A survey was also created to test texting actions, ability, and attitudes. These self-reported items were used to measure potential moderators of the effect of texting on performance, such as

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