SOCIETY FOR THE TEACHING OF PSYCHOLOGY

Teaching of Psychology
2014, Vol 41(1) 44-51

DOI: 10.1177/0098628313514177
top.sagepub.com
SAGE

OMG! Texting in Class = U Fail :(Empirical Evidence That Text Messaging During Class Disrupts Comprehension

Amanda C. Gingerich[1] and Tara T. Lineweaver[1]

Abstract

In two experiments, we examined the effects of text messaging during lecture on comprehension of lecture material. Students (in Experiment 1) and randomly assigned participants (in Experiment 2) in a text message condition texted a prescribed conversation while listening to a brief lecture. Students and participants in the no-text condition refrained from texting during the same lecture. Postlecture quiz scores confirmed the hypothesis that texting during lecture would disrupt comprehension and retention of lecture material. In both experiments, the no-text group significantly outscored the text group on the quiz and felt more confident about their performance. The classroom demonstration described in Experiment 1 provides preliminary empirical evidence that texting during class disrupts comprehension in an actual classroom environment. Experiment 2 addressed the selection bias and demand characteristic issues present in Experiment 1 and replicated the main findings. Together, these two experiments clearly illustrate the detrimental effects of texting during class, which could discourage such behavior in students.

Keywords

texting, distraction, comprehension, cognitive overload

According to Nielsen, U.S. wireless subscribers between the ages of 18 and 24 sent an average of 790 text messages per month between January 2006 and June 2008 (The Nielsen Company, 2008). That equates to more than one text message *on average* sent each hour of every day over the entire month. Survey responses of college students are even more impressive; 95% of students report bringing their phones with them to class every day and 91% report using their phones to text message during class time (Mayk, 2010). Given that text messaging during class is so common, the question of how dividing attention between lecture and text messaging affects students' comprehension and retention of classroom material warrants investigation.

Although there is a relative abundance of research showing the dangers of dividing one's attention through text messaging while driving (e.g., Drews, Yazdani, Godfrey, Cooper, & Strayer, 2009; Hosking, Young, & Regan, 2009; Lee, 2007; Strayer & Johnston, 2001), to our knowledge, no published research has addressed the effects of text messaging in the classroom on comprehension of lecture material. Several researchers have demonstrated that intrusive noises such as a cell phone ringing during cognitive tasks impair academic performance (e.g., End, Worthman, Mathews, & Wetterau, 2010; Hughes & Jones, 2001), but no one has published research investigating the potentially detrimental effects of text messaging during class on learning. This issue is especially pertinent given the high prevalence of text messaging among college students (Mayk, 2010).

Copious research has demonstrated the detrimental cognitive effects of divided attention, although not conducted in a classroom setting. Rubinstein, Meyer, and Evans (2001), for example, found that people lost time as they switched from one cognitive task to another; the amount of time they lost increased as the task became more complex or unfamiliar. Given that students rarely (if ever) focus on a lecture while text messaging, task switching may be a more accurate description of what texting students are doing in class. Other researchers have demonstrated that divided attention impairs memory particularly when attention is divided during the initial learning and encoding of new information (Fernandes & Moscovitch, 2000). Thus, students trying to learn the typically new, complex, and unfamiliar material introduced during lecture may be particularly vulnerable to the divided attention associated with text messaging.

In addition to the scarcity of empirical research addressing the effects of text messaging on learning in the classroom, we were motivated to conduct these experiments by the results of a previous in-class demonstration in which we paired

[1] Department of Psychology, Butler University, Indianapolis, IN, USA

Corresponding Author:
Amanda C. Gingerich, Department of Psychology, Butler University, 4600 Sunset Avenue Indianapolis, IN 46208, USA.
Email: mgingeri@butler.edu

students with someone sitting near them. Half of the pairs comprised a "text-first" group, who completed an entire prescribed text-messaging conversation before reading a research article describing neurological evidence that divided attention modulates the extent to which declarative memory or habit learning contributes to solving a complex problem (Foerde, Knowlton, Poldrack, & Smith, 2006). The remaining pairs comprised a "text-while-reading" group, who began reading the article immediately and completed the same text-messaging conversation while they read. As such, the "text-first" group focused on only one task at a time, while the "text-while-reading" group engaged in frequent task switching. All students took a quiz over the article as soon as they finished reading it.

After 15 min, 70% of the "text-first" group had started the quiz compared to only 40% in the "text-while-reading" group, despite the time delay that occurred before beginning the reading in the "text-first" group. After another 10 min, 40% in the "text-first" group had finished the quiz, compared to only 20% in the "text-while-reading" group. Finally, scores on the quiz revealed that the students who texted while simultaneously reading the article earned an average of 3.6 points, which was notably lower than the 5.6 points earned by the "text-first" group. Based on these findings, we designed a pair of experiments to more rigorously test the deleterious effects of text messaging on learning in a classroom environment.

Experiment 1

Method

Participants

A total of 67 students across three consecutive semesters of an upper-level cognitive processes class at Butler University participated in this experiment. Participation was voluntary, and we did not compensate students, as the experiment was conducted as part of an in-class demonstration.

Materials and Procedure

During a lecture on attention and time management, we asked for volunteers who had unlimited text-messaging plans on their mobile devices and who had their device with them to participate in a demonstration. We selected a subset of these volunteers equal to approximately half of the students in the class to be in the text condition of the experiment. Those in the text condition (n = 35) submitted their mobile phone numbers, which we shuffled and redistributed to one other text-condition student. During the lecture, students in the text condition began and sustained a prescribed conversation via text message with both the person whose phone number they received and the person who received their phone number. The remaining students in the class (those who did not volunteer or whom we did not select for the text condition) were in the no-text control condition (n = 32).

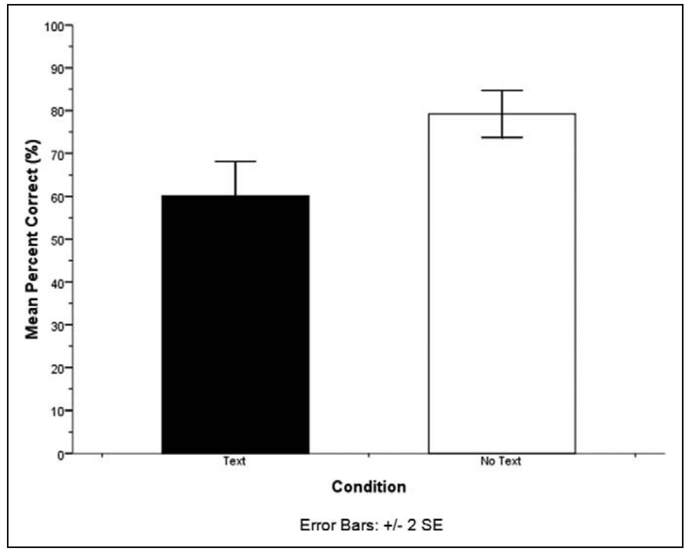

Figure 1. Mean percentage of correctly answered quiz items as a function of text-messaging condition in Experiment 1.

All participants heard a brief lecture on time management strategies and took a quiz (announced before the lecture) on the material from the lecture. We projected the text conversation (see Appendix) on the screen at the front of the room and began the lecture, which lasted approximately 12 min. After a 5- to 7-min delay, participants completed a multiple-choice quiz on the time management material. After taking the quiz but before seeing their grade, participants also assessed their performance by indicating what percentage of the questions they believed they had answered correctly (1 = *0–49%*, 2 = *50–59%*, 3 = *60–69%*, 4 = *70–79%*, 5 = *80–89%*, 6 = *90–99%*, 7 = *100%*). We then collected the experimental materials and resumed the class lecture on divided attention.

Results

Figure 1 displays the mean percentage of correctly answered quiz items as a function of text-messaging condition. A two-way analysis of variance (ANOVA) with condition (text vs. no-text) and semester (Spring 2010 vs. Fall 2010 vs. Spring 2011) as between-participants independent variables revealed a main effect of condition, $F(1, 61) = 14.24$, mean square error (MSE) = 427.51, $p < .001$, $\eta^2 = .189$. Participants in the text condition ($M = 60.14\%$, $SD = 23.81\%$) answered significantly fewer quiz items correctly than did participants in the no-text condition ($M = 79.22\%$, $SD = 15.56\%$). Neither the main effect of semester nor the condition by semester interaction reached significance, both Fs $(2, 61) < 1$, suggesting that the effect of condition was consistent across time.

Figure 2 displays the mean performance self-assessments of participants in the text condition and participants in the no-text condition. A two-way ANOVA with condition (text vs. no-text) and semester (Spring 2010 vs. Fall 2010 vs. Spring 2011) as between-participants factors revealed a main effect of text condition, $F(1, 61) = 31.35$, MSE = 1.32, $p < .001$, $\eta^2 = .339$.

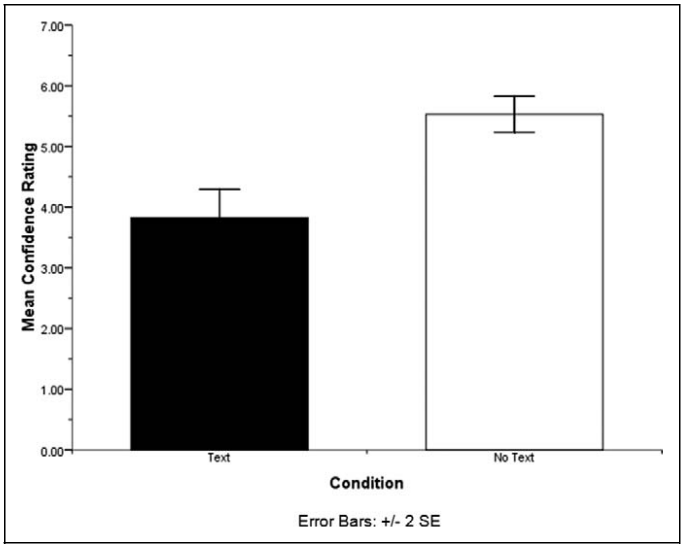

Figure 2. Mean performance self-assessment as a function of text-messaging condition in Experiment 1.

Participants in the text condition ($M = 3.83, SD = 1.38$) did not believe they answered as many items correctly on the quiz as did those in the no-text condition ($M = 5.53$, $SD = .84$). This indicates that participants who texted during the lecture were aware that their performance on the quiz was compromised. The main effect of semester, $F(2, 61) = 1.56$, MSE $= 1.32$, $p = .218$, $\eta^2 = .049$, and the condition by semester interaction, $F(2, 61) = 0.72$, MSE $= 1.32$, $p = .493$, $\eta^2 = .023$, failed to reach significance. Thus, the lower confidence that the text group had in their quiz scores relative to the no-text group was consistent across all three semesters.

Discussion

The demonstration described in Experiment 1 effectively illustrates how texting during class impairs comprehension and retention of lecture material as measured by quiz scores. The results of Experiment 1 also provide preliminary empirical evidence that text messaging during lecture interferes with mastery of lecture material. However, our findings are limited by a number of factors. Our study did not utilize a true experimental design. We did not randomly assign our students to the text or the no-text condition. Instead, students who had mobile phone plans with unlimited text messaging volunteered for the text condition so that students would not incur any monetary expense as a result of their participation. As such, a selection bias may have influenced our results. Specifically, students who are heavy media multitaskers may be more likely to have phone plans with unlimited text messaging. Previous research has shown that, compared to light media multitaskers, heavy media multitaskers are more likely to experience interference from irrelevant stimuli in the environment and from irrelevant memory representations (Ophir, Nass, & Wagner, 2009). Thus, if heavy media multitaskers were overrepresented in our text group and light media multitaskers were overrepresented in our no-text group, the group differences we documented in quiz scores may be attributable to a differential vulnerability to interference from irrelevant stimuli.

Another potential scientific limitation of Experiment 1 is that we conducted it as part of an in-class demonstration of the effects of divided attention. Although students were aware that they would take a quiz on the information, which, presumably, motivated their best effort, they were also aware of the intended outcome of the demonstration, which may have introduced demand characteristics.

To control both of these potential confounds, we designed Experiment 2 to replicate the results of Experiment 1 in a controlled laboratory setting. We excluded students who did not have unlimited texting as part of their mobile phone plans and randomly assigned students who did have unlimited texting to the text or the no-text condition. We lectured over material unrelated to divided attention and included participants who were not enrolled in a cognitive processes class in order to reduce these possible biases.

We also used Experiment 2 to follow up on our somewhat surprising results that demonstrated that students in the text group accurately judged their performance on the quiz to be lower than that of the no-text group. Our students made this judgment after they took the quiz, but before they received their score. One possibility is that students do not realize that text messaging during class is distracting to their learning until *after* they are faced with a quiz on which they do not know several of the answers. In a typical classroom setting, quizzes may follow lectures by several days to several weeks. In this case, a number of intervening events occur between the lecture and the quiz, and students who are seeking explanations for a poor quiz score may be unlikely to attribute their poor retention of lecture material to texting during class. In addition, students who recognize their learning deficit only after taking a quiz may be too late to adjust their study habits in order to overcome it. In other words, students may not *feel* that their learning is impaired after text messaging during a lecture, but they may realize this impairment after attempting to retrieve the material later. If this is the case, text messaging during class may have an even greater detrimental effect on students' grades than we were able to demonstrate in our study. Students may not recognize their lower mastery of the lecture material covered while they were texting until they take a quiz or exam, when it is too late for them to compensate for their decreased initial learning by increasing the time and effort they dedicate to studying that information in preparation for the graded assessment.

Because the design of Experiment 1 did not allow us to determine at what point in time students became aware of how texting during lecture affected their learning, we gathered students' predictions about their performance at several time points in Experiment 2 to investigate whether students who text message during lecture recognize that their comprehension has been compromised even before they take a quiz. Including additional measures of students' learning confidence also allowed us to investigate whether the accuracy of students' metacognitive judgments are affected by their being distracted by text messaging while learning new material in class. Some researchers have found that dividing participants' attention while they encode a word list results in less accurate judgments of their own learning than allowing participants to focus their attention (e.g., Barnes & Dougherty, 2010). Experiment 2 allowed us to investigate whether this is also true when applied to learning lecture material in a classroom-like setting.

Experiment 2

In order to address the selection bias and demand characteristics present in Experiment 1, we designed and conducted a more controlled experiment, one that did not take place in the context of a class on divided attention and one in which participants were randomly assigned to text or not to text during the "lecture."

Method

Participants

Fifty-six undergraduate students (40 women and 16 men) at Butler University participated in this experiment. Participants either received extra credit in a psychology course or a US$10 gift card to a fast-food restaurant in return for their participation. Participants were recruited from psychology courses through an online participant management program.

Materials and Procedure

Participation occurred in group testing sessions that ranged in size from 1 person to 15 people. After obtaining informed consent, we told participants that the purpose of the study was to investigate how classmates communicate about lecture material and how their communication affects learning. We randomly assigned each participant to the "text" or "no-text" condition. However, in order to minimize participants' expectations regarding their performance in this experiment, we told participants that they were assigned to one of three conditions: a no-text group, a text about lecture content group, or a text about unrelated content group. In reality, no participants texted about lecture content. Participants were told that they would listen to a lecture about the effectiveness of various study strategies before taking a quiz on the lecture content. All participants were told to take notes on the lecture material as though they were in class. Participants then received a packet containing their assigned condition and a text conversation between two people. Those assigned to the text condition received the phone number of one other participant and were instructed to skim the conversation and to begin texting that conversation when the "lecture" began. Those assigned to the no-text condition were instructed to read the text conversation, which had occurred between two students recently. After learning what the quiz would involve but before the lecture began, participants predicted how well they would perform on the quiz by indicating how many of the nine quiz questions they expected to answer correctly. After they made their prediction, the experimenter began the lecture on how people learn.

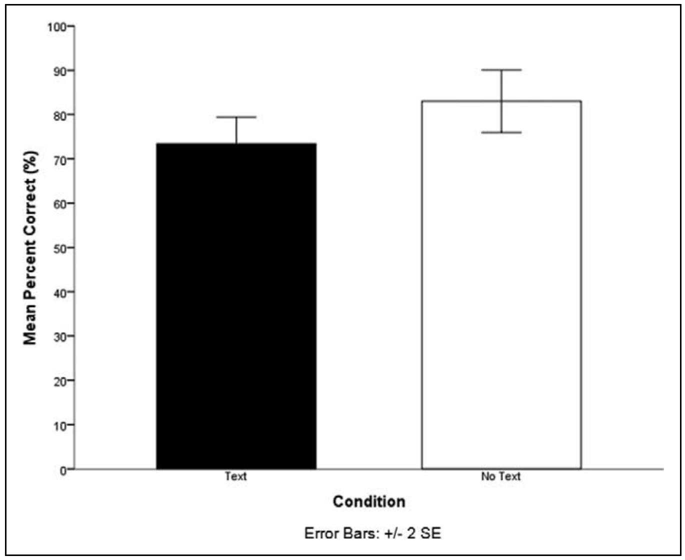

Figure 3. Mean percentage of correctly answered quiz items as a function of text-messaging condition in Experiment 2.

Participants in the text condition sustained the prescribed conversation via text message with another student in the room during the lecture, whereas those in the no-text condition did not. At the end of the approximately 30-min lecture, participants again predicted how well they would perform on the quiz.

In order to prevent participants from rehearsing lecture content, we instituted a distractor phase, in which participants watched an episode of "SpongeBob Squarepants" for approximately 10 min. They then rated the extent to which the episode portrayed feelings in SpongeBob such as excitement, fear, and nervousness. After the distractor phase, participants completed a multiple-choice quiz about the lecture content and offered a final estimate of their performance on the quiz. We then thanked and fully debriefed participants.

Results

Figure 3 displays the mean percentage of correctly answered quiz items as a function of text-messaging condition. A one-way ANOVA with condition (text vs. no-text) as a between-participants independent variable revealed a main effect of condition, $F(1, 54) = 4.33$, MSE $= 0.03$, $p < .05$, $\eta^2 = .074$. As hypothesized, participants in the text condition ($M = 73.41\%$, $SD = 16.95\%$) answered significantly fewer quiz items correctly than did participants in the no-text condition ($M = 83.00\%$, $SD = 17.26\%$).

Figure 4 contains students' judgments of learning (JoLs) as a function of condition and time of judgment. A multivariate ANOVA with condition (text vs. no-text) as a between-participants independent variable and time of judgment (prelecture, postlecture, postquiz) as a within-participants variable revealed a significant effect of condition such that those in the text condition ($M = 57.50\%$, $SD = 21.09\%$) gave significantly lower JoLs than did those in the no-text condition ($M = 80.07\%$, $SD = 14.05\%$), $F(1, 54) = 29.66$, MSE $= 0.07$, $p <$

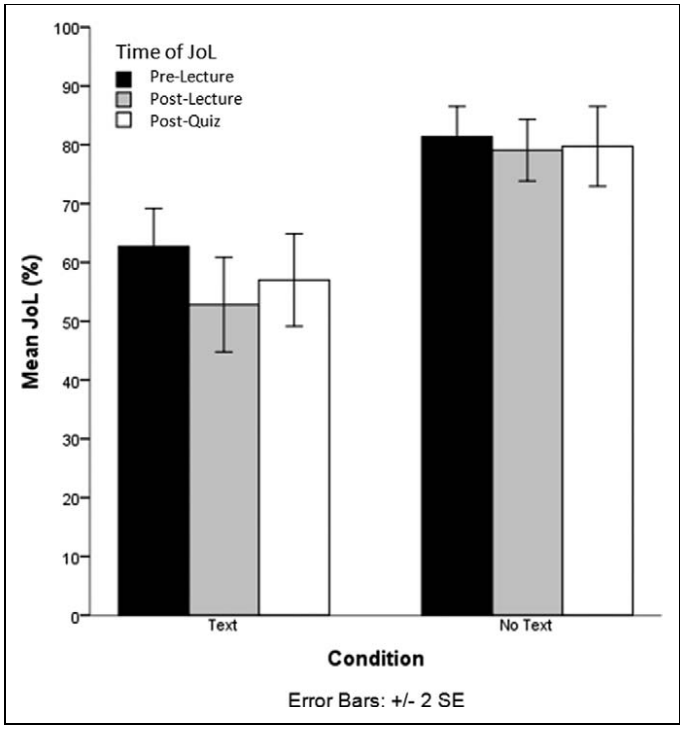

Figure 4. Judgments of learning (JoLs) as a function of text-messaging condition and time of judgment in Experiment 2.

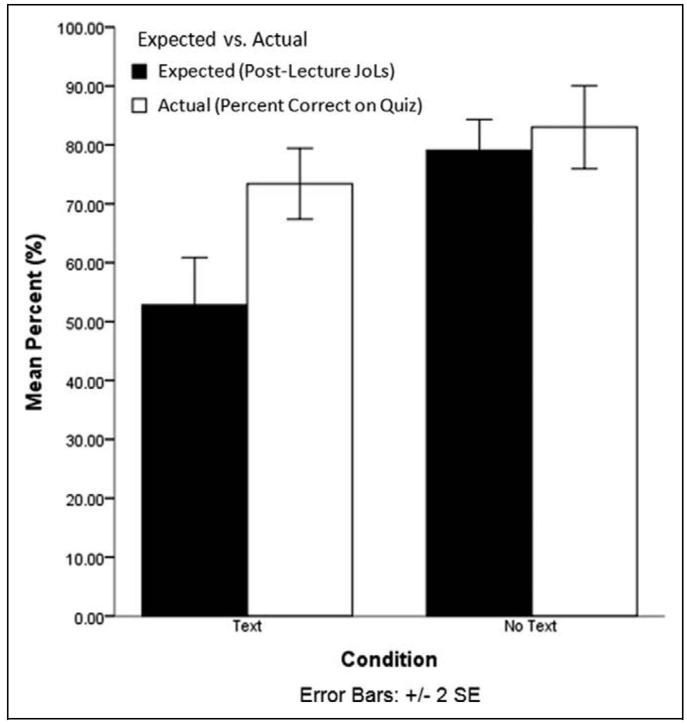

Figure 5. Expected performance (postlecture JoLs) and actual performance (mean percentage of correctly answered quiz items) as a function of text-messaging condition in Experiment 2. JoLs = Judgments of learning.

.001, $\eta^2 = .355$. There was also a significant effect of time of judgment, $F(2, 53) = 4.75$, Wilks' $\lambda = .85$, $p < .05$, $\eta^2 = .152$. Post-hoc paired samples t-tests indicated that JoLs made before the lecture began ($M = 70.70\%$, $SD = 18.53\%$) were significantly higher than those made after the lecture but before the quiz ($M = 64.07\%$, $SD = 23.09\%$), $t(55) = 3.33$, MSE = .02, $p < .001$. Post-lecture JoLs did not statistically differ from those made after the quiz ($M = 66.75\%$, $SD = 22.85\%$), $t(55) = 1.10$, MSE = .02, $p = .274$. There was also not a statistically significant difference between JoLs made before the lecture and those made after the quiz, $t(55) = 1.44$, MSE = .03, $p = .155$. The Time of Judgment × Condition interaction was not significant indicating that changes in JoLs across time were consistent regardless of whether participants were in the text or the no-text group, $F(2, 53) = 1.87$, Wilks' $\lambda = .93$, $p = .164$, $\eta^2 = .066$.

To investigate the consistency between participants' JoLs and their actual performance, we ran a two-way ANOVA with actual versus expected quiz scores as a within-participants variable and text condition as a between-participants variable. Because we were interested in the extent to which texting during lecture affects participants' ability to accurately monitor the extent to which they have learned just-presented information, "Expected" quiz scores refer to the JoLs that participants made after the lecture, but before taking the quiz.[1] As shown in Figure 5, participants in both conditions underestimated the percentage of quiz items that they would get correct ($M_{\text{PercentCorrect}} = 77.52\%$, $SD_{\text{PercentCorrect}} = 17.59\%$; $M_{\text{JoL}} = 64.07\%$, $SD_{\text{JoL}} = 23.09\%$, $F(1, 54) = 12.66$, MSE = 325.40, $p < .005$, $\eta^2 = .190$). More importantly, the Expected versus Actual quiz performance × Text Condition interaction was significant, $F(1, 54) = 5.86$, MSE = 325.40, $p < .05$, $\eta^2 = .098$. Specifically, participants in the no-text condition showed much higher consistency between their expected ($M_{\text{JoL}} = 79.08\%$, $SD_{\text{JoL}} = 12.86\%$) and actual ($M_{\text{PercentCorrect}} = 83.00\%$, $SD_{\text{PercentCorrect}} = 17.26\%$) quiz scores than did participants in the text condition ($M_{\text{JoL}} = 52.81\%$, $SD_{\text{JoL}} = 22.76\%$; $M_{\text{PercentCorrect}} = 73.41\%$, $SD_{\text{PercentCorrect}} = 16.95\%$). This suggests that text messaging during lecture disrupts the cognitive processes associated with learning as well as those involved in judging how well material is learned. Interestingly, although Barnes and Dougherty (2010) found that dividing attention results in overconfidence, our results suggest that, in the case of dividing attention via text messaging, individuals recognize the potentially detrimental effects and overadjust for them when formulating their performance expectations.

Discussion

Consistent with the results of Experiment 1, the results of Experiment 2 provide evidence that text messaging during lecture impairs comprehension and retention of lecture content. When we took steps to reduce the demand characteristics associated with performing the demonstration within the context of a class on divided attention, the impaired performance among those who text messaged during lecture remained. Likewise, the effect persisted when participants were randomly assigned to text-messaging conditions, thereby eliminating selection biases.

Also consistent with the results of Experiment 1 was the finding that JoLs of those in the text condition were lower than those of participants in the no-text condition. To some extent, participants seemed to realize that their performance would be impaired, even before they had their attention divided during lecture. Even more remarkable is the finding that those who did not text had more accurate expectations about their quiz performance than those who did text. This implies that, in addition to actual attention and comprehension processes, the monitoring involved in metacomprehension processes may be impaired by text messaging during lecture.

Although we attempted to eliminate demand characteristics in Experiment 2, the finding that students in the text condition anticipated performing worse on the quiz than those in the no-text condition even before they heard the lecture suggests that participant expectations could have still contributed to performance differences on the quiz. We hoped to mitigate the effects of this expectation by telling all participants that there were two texting groups—one who texted about lecture material and one who texted about unrelated content. Our rationale was that participants in the no-text condition might also lower their expectations about their quiz scores if they believed texting about the lecture content would improve retention of the lecture material, making the no-text and text group more comparable in their prelecture expectations. Because we did not actually include a group who texted about the lecture material, we cannot address how this cover story affected either expectations or performance. Perhaps future replications of this study could investigate this issue directly or could directly examine whether telling participants that texting actually *improves* quiz scores would yield the same effects on performance.

In summary, the results of Experiment 2 provide additional evidence that text messaging during a lecture results in lower scores on a subsequent quiz assessing comprehension of lecture material. Even when the methodological limitations present in conducting the classroom demonstration described in Experiment 1 were addressed, the effect of text messaging during lecture was apparent.

General Discussion

Although the results of these two studies may confirm what many college instructors already know, or at least suspect to be true, students in our classes often seem surprised by how detrimental texting during class is to their learning when it is demonstrated to them. Many students may believe that they can listen to a lecture while also engaging in a text message conversation because one task is primarily auditory and the other primarily visual in nature. The results of our two experiments showed that, on average, students who text during class can decrease their initial learning from a B level (i.e., 81.11%) to a D level (i.e., 66.78%). In many courses, this would mean the difference between passing and not passing. The results were consistent across each of the three semesters of Experiment 1 as well as in the more controlled environment of Experiment 2, suggesting that the effect is likely to be reliable with future students in other classes and other disciplines.

We did the Experiment 1 demonstration in a cognitive processes class as part of a lecture about divided attention, but college instructors could easily incorporate it into their courses at any point in the semester. Because the demonstration can occur during a lecture, it requires very little extra class time other than that needed to administer a short quiz, grade it, and graph the scores. As students' text messaging in college classrooms has become more prominent (Mayk, 2010), some instructors have responded by limiting or forbidding the use of cell phones during class (cf. Gilroy, 2004). Perhaps an in-class demonstration like the one we describe in Experiment 1 would more effectively convince students that dividing their attention during class (whether via text messaging or other means) is not in their best interest academically and would have a greater potential to generalize to other classes or to other settings where divided attention or task switching can interfere with students' cognitive efficiency.

Unexpectedly, our results indicate that students are aware that texting during lecture impairs their learning, at least when they are explicitly told that they will be text messaging during a lecture on which they will later be quizzed. Given the prevalence of texting during our classes, we were surprised to find that students who knew that they would be texting during lecture expected to learn less. This raises at least three important questions that may warrant additional research. (1) If students are aware that text messaging will damage their ability to comprehend lecture material, then why do so many students insist upon text messaging during class? Future research investigating this question may help to disambiguate the relationship between students' metacognitive beliefs and their behaviors. Relatedly, (2) Could students' behavior in the classroom be aligned with their understanding of the "dangers" of text messaging during lecture simply by reminding those who are texting of their task and asking them to consider how well they will learn class material while they are texting? Perhaps this exercise in predicting learning and performance could enhance students' ability to calibrate their confidence in their learning with their accuracy. Finally, (3) Could it be the case that texting reduces initial learning of material but does not necessarily affect performance on typical classroom assessments? If, as seems to be the case in our study, students realize that texting has negatively affected their initial learning, they could potentially compensate for this through increased studying between the time of the lecture and the time they take a quiz or exam.[2] In fact, given that the JoLs of students who text during lecture actually underestimate their mastery of the lecture material, they may instead overcompensate for their perceived lack of learning by studying more than necessary to close the achievement gap, putting them at an advantage relative to students who do not text during class. Incorporating announced delayed assessments into future studies of the effects of texting during lecture could investigate this interesting possibility.

Future research could also address how utilizing a prescribed text message conversation impacted the external validity of our study. In order to increase experimental control, we dictated the content of the text messages that participants exchanged. It is possible, though, that this made the text condition even more demanding of attention. Maintaining one's place in the conversation and ensuring proper punctuation and spelling may have made completing the task more difficult than text messaging in "real life." Under "normal" texting circumstances, individuals can minimize the attentional impact of dividing their attention by using "text-speak" and shortening phrases and words, an option that was not available to the participants of this experiment. On the other hand, having the text message prescribed may have reduced the cognitive demands of the texting task. It is possible that generating appropriate responses to a spontaneous text conversation would require more cognitive resources than simply copying a scripted response (see Strayer & Johnston, 2001). If this is the case, our results may actually underestimate the cognitive cost involved with texting during lecture. Replicating the design of Experiment 2 while permitting participants to compose a unique text conversation would more directly address this issue.

Future studies could also replicate our study using alternative types of assessments. The quizzes that students took in both of our experiments were fairly basic multiple-choice quizzes that asked students simply to recognize the information from the lecture. Although the quiz in Experiment 2 required more thorough understanding and critical analysis of lecture material than the quiz in Experiment 1, neither quiz required recall of lecture content, open-ended comparison of theories or evaluation of evidence, or creation of unique ideas. Many formal assessments in college classrooms do ask students to critically appraise and apply lecture material to new situations. We suspect that the decreased ability of the text group to demonstrate a basic understanding of lecture material compared to our no-text group suggests that they would also struggle (and perhaps more so) with questions evaluating their learning at a more complex level of understanding, having even stronger implications for the ways in which instructors handle text messaging in the classroom.

Appendix

Text Conversation—Experiment 1

- "Hi. Im txting u from Cog."
- "Hi. Who's this?"
- "It's [your name]. Who's this?"
- "It's [your name]. Did u watch the Superbowl on Sunday?"
- "[Answer Yes or No]. Did u?"
- "[Answer Yes or No]."
- "I couldn't wait 2 come 2 class today."
- "I know. Dr. G rocks. This is my fave class."
- "Mine too. Psych is the best subject ever!"
- "I know! :) I tell my fam that all the time."
- "So do I! I'm so glad I study Psych @ Butler."
- "Me too. Learning about psych is the highlight of my day."
- "The highlight of my day is sharing what I learn with my friends!"
- "Yeah, they're always impressed by the demos."
- "This conversation is cheesy."
- "Yeah, peace out."

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Notes

1. Analyses conducted on all three judgments of learning (JoLs) combined yielded the same results.
2. We thank an anonymous reviewer for this suggestion.

References

Barnes, K. A., & Dougherty, M. R. (2007). The effect of divided attention on global judgment of learning accuracy. *American Journal of Psychology*, *120*, 347–359. Retrieved from EBSCO host

Drews, F. A., Yazdani, H., Godfrey, C. N., Cooper, J. M., & Strayer, D. L. (2009). Text messaging during simulated driving. *Human Factors*, *51*, 762–770. doi:10.1177/0018720809353319

End, C. M., Worthman, S., Mathews, M., & Wetterau, K. (2010). Costly cell phones: The impact of cell phone rings on academic performance. *Teaching of Psychology*, *37*, 55–57. doi:10.1080/00986280903425912

Fernandes, M. A., & Moscovitch, M. (2000). Divided attention and memory: Evidence of substantial interference effects at retrieval and encoding. *Journal of Experimental Psychology: General*, *129*, 155–176. doi:10.1037/0096-3445.129.2.155

Foerde, K., Knowlton, B. J., Poldrack, R. A., & Smith, E. (2006). Modulation of competing memory systems by distraction. *Proceedings of the National Academy of Sciences of the United States of America*, *103*, 11778–11783. doi:10.1073/pnas.0602659103

Gilroy, M. (2004). Invasion of the classroom cell phones. *Education Digest*, *69*, 56–60.

Hosking, S. G., Young, K. L., & Regan, M. A. (2009). The effects of text messaging on young drivers. *Human Factors*, *51*, 582–592. doi:10.1177/0018720809341575

Hughes, R., & Jones, D. (2001). The intrusiveness of sound: Laboratory findings and their implications for noise abatement. *Noise and Health*, *13*, 51–70.

Lee, J. D. (2007). Technology and teen drivers. *Journal of Safety Research*, *38*, 203–213. doi:10.1016/j.jsr.2007.02.008

Mayk, V. (2010). *Wilkes university professors examine use of text messaging in the college classroom* [News Archive]. Retrieved from http://www.wilkes.edu/pages/194.asp?item=61477

Ophir, E., Nass, C., & Wagner, A. D. (2009). Cognitive control in media multitaskers. *Proceedings of the National Academy of Sciences of the United States of America*, *106*, 15583–15587. doi:10.1073/pnas.0903620106

Rubinstein, J. S., Meyer, D. E., & Evans, J. E. (2001). Executive control of cognitive processes in task switching. *Journal of Experimental Psychology: Human Perception and Performance*, *27*, 763–797. doi:10.1037/0096-1523.27.4.763

Strayer, D. L., & Johnston, W. A. (2001). Driven to distraction: Dual-task studies of simulated driving and conversing on a cellular phone. *Psychological Science*, *12*, 462–466.

The Nielsen Company. (2008, September 22). *In U.S., SMS text messaging tops mobile phone calling* [Web log post]. Retrieved from http://blog.nielsen.com/nielsenwire/online_mobile/in-us-text-messaging-tops-mobile-phone-calling/