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Texting and the Efficacy of Mnemonics: Is Too Much Texting Detrimental?

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Abstract

The rapidly growing social phenomenon of texting has attracted researchers from diverse disciplines who seek to study its effects. Texting typically involves the use of abbreviations and other shortcuts to craft cell phone messages. Collectively, these abbreviations and shortcuts are referred to as "text speak." The authors observe that some mnemonics are very similar in form to various types of text speak. Based on the similarities, it is hypothesized that heavy texters will be more receptive to mnemonics and thus benefit more from them. The results of this study indicate that there is a significant relationship between heavy texting and the efficacy of mnemonics; however, the relationship is negative rather than positive as was hypothesized. Possible explanations, implications, and future research are discussed.

Keywords: texting, mnemonics, text speak

1. INTRODUCTION

For American teens, texting has become the preferred mode of communication, surpassing face-to-face contact, email, and even voice calls. This finding was confirmed in a recent survey conducted by the PewResearchCenter(Lenhart, Ling, Campbell, & Purcell, 2010) and it supports an earlier report that appeared in Wired.com (Ganapati, 2008). The Pew Report also indicates that half of all teens send 50 or more text messages a day, and one third send more than 100 texts a day. This rapidly growing

social phenomenon has attracted researchers from diverse disciplines who seek to study its effects.

Some teachers, parents, and language experts have emphasized the strong negative effects of texting on literacy (Brown-Owens, Eason &Lader, 2003; Humphrys, 2007; Lee, 2002; Thurlow, 2006; Vosloo, 2009). On the other hand, researchers have recently argued that texting has either a positive effect on literacy (Plester, Wood & Joshi, 2009), or that it is neutral and is nothing to worry about (Crystal, 2009; Drouin, & Davis, 2009). Given these diverse findings and opinions, it is likely that this research stream will be active for some time.

Rather than a broad study of the effects of texting on literacy, this paper focuses quite specifically on the effects of texting on the efficacy of mnemonics. Texting typically involves the use of abbreviations and other shortcuts to craft cell phone messages. Collectively, these abbreviations and other shortcuts are referred to as "text speak" and include: acronyms (LOL, OMG), contractions (txt vs. text), shortenings (bro vs. brother), g clippings (goin vs. going), letter/number homophones (2nite), nonconventional spellings (fone vs. phone), accent stylization (elp vs. help), and initialisms (Nabisco refers to the National Biscuit Company) (Plester et al., 2009).

The authors observed that some mnemonics are very similar in form to various types of text speak. One common mnemonic for remembering a list of items consists of an easily remembered acronym, or phrase with an acronym, that is associated with the list. For example, to remember the five dimensions of employee satisfaction: variety, identity, significance, autonomy and feedback one can use the mnemonic VISA F. The authors wondered if heavy texters would be more receptive to, and thus benefit more from mnemonics; because of their heavy use of text speak. If this were found to be true, then educators should be encouraged to increase their use of mnemonics and even to create new ones if appropriate for their learning goals.

A review of the literature on texting and on mnemonics revealed no studies that examined the relationship between them. This exploratory study is a first attempt to address that area of research.

The research goal is as follows: (1) identify subjects who are high texters and low texters or talkers, and (2) conduct an experiment to test for differences in performance between these two groups when they are exposed to acronyms or other mnemonics.

Hypothesis: Heavy texters, when exposed to a new acronym or other mnemonic, will remember the content associated with the acronym or mnemonic significantly better compared to low texters or talkers.

2.METHODOLOGY

Sample

Undergraduates from a regional university in the southern U.S. were selected to participate. Nine classes were surveyed, totaling 479 participants. Each class was randomly assigned to either a control group, an acronym group, or a mnemonic group.

A questionnaire was developed to collect data about the subjects' texting behavior including: the number of texts they typically sent per day and per week as well as their grade point average (GPA) and demographics. To facilitate the pretest posttest matching of responses, subjects were also asked to write their student ID on the questionnaire.

Pretest

A pretest of the subjects' knowledge of the college of business (COB) learning goals was given at the beginning of a class along with the questionnaire. The pretest involved asking students to write the four learning goals of the COB on the questionnaire.

The grading procedure involved reading the response to each of the four goals, and assigning either zero points for no answer or an incorrect answer, one point for a partially correct answer, and two points for a fully complete answer. For example, if a subject wrote down all four goals correctly he or she would receive a score of 8 resulting in a possible range of scores from zero to eight. Each subjects' responses were graded first by a graduate student and subsequently by one of the authors. Any discrepancies were resolved.

Treatments

Once students completed the pretest, they were shown a PowerPoint presentation with a recorded narration about the COB learning goals. The use of one narrator to record PowerPoints for the three treatment groups was employed to reduce bias that could be

introduced by having different instructors make the presentations. The narrator not only read the goals but also mentioned that the subjects may be tested on these goals at a later date. The control group received the following narrated bullet points:

1. Students will be effective written and oral **communicators** with the ability to use appropriate technologies to enhance their communications.
2. Students will be able to apply **critical thinking** in making sound business decisions.
3. Students will be able to demonstrate competency in the **core** business disciplines.
4. Students will demonstrate awareness of **ethical** issues in business.

The acronym group received the same narrated bullet points but with a different pattern of boldings, and were told via the narration that an acronym (CCCE) may help them remember the goals:

1. Students will be effective written and oral **C**ommunicators with the ability to use appropriate technologies to enhance their communications.
2. Students will be able to apply **C**ritical thinking in making sound business decisions.
3. Students will be able to demonstrate competency in the **C**ore business disciplines.
4. Students will demonstrate awareness of **E**thical issues in business.

The mnemonic group also received the same narrated bullet points but with yet another pattern of boldings, and were told via the narration that a mnemonic learning aid (CommCritCorE) may help them remember the goals:

1. Students will be effective written and oral **Comm**unicators with the ability to use appropriate technologies to enhance their communications.
2. Students will be able to apply **Crit**ical thinking in making sound business decisions.
3. Students will be able to demonstrate competency in the **Core** business disciplines.
4. Students will demonstrate awareness of **E**thical issues in business.

Posttests and Dependent Variables

Posttest1 was conducted at the end of the same one-hour class in which the pretest was conducted, by having the subjects once again write down the four learning goals of the COB. Posttest2 was conducted two days later, at the beginning of the next class, by having subjects write down the four learning goals of the COB.

The dependent variables of interest are related to the change in memory/awareness of the COB learning goals from the pretest to posttest1 and posttest2. The dependent variables are defined as:

diff1 = posttest1 – pretest

diff2 = posttest2 – pretest

Variable diff1 thus represents the change in memory/awareness one hour after a PowerPoint treatment, and variable diff2 represents the change two days after a PowerPoint treatment.

Texters versus Talkers

Subjects were divided into high texters, which we refer to as (texters), and low texters which we refer to as (talkers), based on quartiles. Students whose total number of text messages sent in a week fell in the fourth quartile were coded as texters, while those who fell in the first quartile were coded as talkers. Those who fell in the middle two quartiles were coded as tweeners; however, the tweeners were not a focus of this study.

To test the hypothesis the authors selected cases with texters and talkers. The file was then split into three PowerPoint treatments: a control group, an acronym group, and a mnemonic group. Then, for each of the three treatment groups, we tested the dependent variables for differences between texters and talkers.

3. RESULTS

A total of 479 students participated in the study. Of these, 245 (51%) were male and 234 (49%) were female. The average age was 21 years. They were primarily sophomores, juniors and seniors (95%). The average GPA was 2.85 on a 4-point scale. The average number of text

messages sent per day was 55 and the average per week was 364.

To focus on differences between high texters and low texters or talkers, the first and fourth quartiles were selected based on the number of text messages sent per week. This resulted in 131 low texters from the first quartile, which are referred to as "talkers," and 118 high texters from the fourth quartile which are referred to as "texters". Table 1 provides a profile of the talkers and texters. The only notable difference between these two groups, other than the number of texts they send, is that the texters have been texting for an average of 5 years while the talkers have been texting for an average of only 3 years.

Table 1. Talkers and Texters

	Msg/ Week	Years Texting	Age	GPA
Talkers				
Mean	20	3	24	2.96
Median	14	2	22	3.00
Min	0	0	18	2.00
Max	50	10	59	4.00
N*	131	127	131	120
Texters				
Mean	1091	5	21	2.70
Median	1000	5	21	2.70
Min	450	2	19	1.00
Max	7000	12	25	4.00
N*	118	118	114	115

* not every subject answered every question

A comparison of talkers versus texters in each of the experimental groups after one hour revealed that talkers consistently scored higher than texters (Table 2). However, none of the differences were significant.

Table 2. Improvement After 1 Hour Posttest1 – Pretest Scores

Experimental Condition	Mean	N	F	Sig.
Control				
Talkers	2.82	40	1.32	.71
Texters	2.66	36		
CCCE				
Talkers	2.20	39	.630	.43
Texters	1.92	39		
CommCritCorE				
Talkers	2.94	52	.987	.32
Texters	2.52	42		

After two days talkers again scored higher than texters and they were significantly higher in the acronym (CCCE, .03) and mnemonic (CommCritCorE, .05) groups (Table 3).

There was no significant difference in the control group (.77). This finding is the opposite of what was hypothesized. Talkers in this study, after a two day period, appear to have benefitted more from both the acronym and mnemonic than texters.

Potential covariates such as students' GPA and gender were examined in these analyses. None of the variables were found to be significantly related to any of the treatment variables; therefore, they were excluded from all subsequent analyses.

Table 3. Improvement After 2 Days Posttest2 – Pretest Scores

Experimental Condition	Mean	N	F	Sig.
Control				
Talkers	3.05	36	.084	.77
Texters	2.90	31		
CCCE				
Talkers	2.32	31	4.95	.03
Texters	1.44	29		
CommCritCorE				
Talkers	3.20	40	3.90	.05
Texters	2.28	35		

4. DISCUSSION OF RESULTS

An interesting finding of this research is that there is a relationship between heavy texting and the efficacy of mnemonics. The surprising aspect is that the relationship is negative, i.e. heavy texters score significantly lower than talkers when both were exposed to the COB learning goals and were provided with a mnemonic to help them remember the goals.

Several possible explanations of the results can be considered. First, it is possible that high texters may be desensitized to mnemonics. In other words, heavy texters due to their heavy use of "text speak," which is similar in form to acronyms and mnemonics, do not find new acronyms and mnemonics interesting enough to server as effective memory aids.

A second possible explanation relates to the size of an individual's vocabulary. Although the English language contains over one million words, the average person's vocabulary includes no more than thirty-five thousand words (Crystal, 2007). Perhaps there is also a "text speak" vocabulary limit and heavy texters have reached their limit and are thus less likely to add

a new acronym or mnemonic that resembles text speak. Additional research would need to be conducted to determine if there is some kind of "natural limit" to the number of mnemonics or "texting shortcuts" for the average person.

A third possible explanation is related to a relatively new stream of research on how living with technology is altering our brains (Carr, 2010; Small & Vorgan, 2008; Stone, 2009). Carr (2010) discussed how he believes the Internet and its frantic superficiality is destroying our powers of concentration and he cites some scientific evidence to support his beliefs. Small and Vorgan (2008) also cite evidence that "the current explosion of digital technology not only is changing the way we live and communicate but also is rapidly and profoundly altering our brains."

The heavy texters in the current study are constantly being interrupted by receiving and responding to text messages. They averaged 1091 texts per week (Table 1). For subjects who were awake for 16 hours per day that is the equivalent of about 10 texts per hour, or one every 6 minutes. Such heavy texters would appear to be in a state of "continuous partial attention" a term coined by Stone, 2009.

Continuous partial attention is different from simple multi-tasking. With simple multi-tasking, at least one of the activities is somewhat automatic or routine, like eating lunch. That activity is then paired with another activity that is automatic or with an activity that requires cognition, like writing an email or talking on the phone. We multi-task to be more productive. With continuous partial attention, on the other hand, the motivation is a desire not to miss anything. Individuals are engaged in two activities that both demand cognition. For example, people talking on the phone and driving, or texting while listening to a lecture.

Continuous partial attention describes a state where individuals scan for an opportunity for any type of contact at every given moment. This places their brain in a heightened state of stress where their adrenalized "fight or flight" mechanism kicks in. Some research suggests that the end result of such chronic and prolonged techno-brain burnout can be the reshaping of underlying brain structure (Small &Vorgan, 2008).

Regardless of whether or not heavy texting has the effect of altering the brain, the state of continuous partial attention produced by heavy texting may diminish one's ability to concentrate and thus to remember material that is presented to them.

One other issue to consider about this research is whether or not allowing the students to devise their own mnemonic would improve their performance versus having the instructor supply one. Evidence suggests that this may be the case. For example, researchers have found that subjects who produce their own mnemonics have better recall because self-generation produces better understanding (Bobrow & Bower, 1969); creates easier images (Dickel & Slak, 1983); and makes mnemonics more meaningful to the individual subject (Garten & Blick, 1974). A future research question raised by the current study would then be does the performance of heavy texters differ from low texters when individuals in both groups generate their own mnemonics.

5. RESEARCH CONTRIBUTION

If the findings of this study are confirmed, teachers of heavy texters should be cautioned about promoting the use of mnemonics as a means to memorize course material.

The implications of the study may be of interest to teachers and students in a variety of fields. Certainly the fields of Information Systems and Computer Science are well known for their heavy use of acronyms. In addition, many other disciplines make use of acronyms. This is suggested by the number of internet sites dedicated to mnemonics designed for various disciplines including: anatomy, chemistry, physiology, and biochemistry (www.valuemd.com/mnemonics.htm) , mathematics (www.onlinemathlearning.com/math-mnemonics.html), and home schooling (www.betterendings.org/homeschool/fun/mnemonic.htm).

6. LIMITATIONS

This was an exploratory experiment in a classroom setting. Although efforts were made to reduce bias in the experiment, the more controlled experimental conditions of a laboratory would be helpful to confirm the findings.

This study is also limited by the age range and educational level of the subjects enrolled in business classes of a regional university in the Southern United States.

7. CONCLUSIONS

Although there have been numerous recent studies regarding the effects of texting on literacy (Crystal, 2009; Drouin& Davis, 2009; Plester et al., 2009; Vosloo, 2009), this is the first study to examine the effects of texting on the use of mnemonics. The implications of the findings may be of interest to teachers and students of any discipline that makes use of mnemonics.

For future research, it is probably more important to confirm that there is a significant relationship between heavy texting and mnemonics rather than focusing on why the relationship is negative.

For those who are interested in why the relationship is negative, there are a number of lines for follow-on inquiry. Several of these areas for future research were mentioned in the Discussion of Results Section. One other area is worth noting. Texting is an informal mode of communication that may be considered superficial and lacking the nuances of a formal language. Students who make heavy use of texting may adopt a pattern of behavior which lacks attention to detail and this may explain why they have more difficulty remembering material associated with mnemonics.

Additional research along one or more of these lines of inquiry would help to clarify and extend this study.

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