UNREGULATED SPACE: TEXT-MESSAGING HABITS AS A PREDICTOR OF

PUNCTUATION ERRORS IN THE ACADEMIC WRITING

OF COLLEGE STUDENTS

by

Robert Ryan Achuff

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A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

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APPROVED BY:

Casey Reason, Ph.D., Committee Chair

Joan Fitzpatrick, Ph.D., Committee Member

Chris Bowman, Ed.D., Committee Member

ABSTRACT

Most college-aged students use text messaging to communicate with others (Smith, 2011). Text messaging, though it requires a writer to be concise, makes allowances for "textese," an informal register of English. At the same time, college students and college graduates are expected to be proficient in writing. Using a theoretical framework influenced by self-regulation (Bandura, 1986), memory (Bartholomae, 1980; Flower & Hayes, 1981; Hayes, 1996; Hayes & Chenoweth, 2006; Kellogg, 2006), and transfer (Perkins & Salomon, 1992; Salomon & Perkins, 1989), a correlational study was conducted to compare the participants' text messaging habits to participants' frequency of punctuation errors in their academic writing. The predictor variables were the frequency of text messaging (Grace, Kemp, Martin, & Parrila, 2014; Rosen, Chang, Erwin, Carrier, & Cheever, 2010) and the frequency textese (Thurlow & Brown, 2003); the criterion variable was the frequency of punctuation errors (Lunsford & Lunsford, 2008) a participant uses in his or her academic writing. The participants were 115 college students from a four-year college in the Southeast United States. Data were collected via a survey, writing samples, and content analyses. The data obtained from these instruments were analyzed by a multiple regression, a statistical method that showed the relationship between the participants' text-messaging habits and literacy. The null hypothesis was not rejected because there was no significant relationship between the combined predictor variables and the criterion variable.

Keywords: punctuation, literacy, self-regulation, Standard English, text messaging, textese, writing.

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CHAPTER ONE: INTRODUCTION

Overview

The purpose of this study was to examine the relationship between the text-messaging habits of college students and their ability to use punctuation in their academic writing and to determine the strength of this relationship via a multiple regression analysis. Chapter 1 will discuss the background related to the study, specifically as it pertains to the importance of written literacy in an academic setting, the pervasiveness of text messaging among college students, and the theoretical underpinnings of the present study. The problem statement will be discussed, and it will be shown how the present study complements previous studies. Furthermore, the purpose of this study will be discussed along with the significance of the study, the research question, and relevant definitions.

Background

Murray (2004) described writing as "a craft, a habit, a discipline that can be understood and practiced" (p. 24). It is a complex act that requires writers to plan, produce, and review their thoughts (Flower & Hayes, 1981). Of the many expectations placed upon student writers, they must know how to use correct punctuation. Using correct punctuation is important because it is a skill that marks a college and career-ready person (Common Core State Standards, 2010) and it is a skill desired by employers (Jones, 2011). Though correct punctuation is expected of students, Lunsford and Lunsford (2008) reported that a punctuation error was the second-most frequent error in their analysis of college-student papers. Complicating this finding, Smith (2011) reported that 97% of 18-24 year-olds made frequent use of text messaging, a writing venue that accommodates informal writing conventions (Crystal, 2008), even as it pertains to punctuation (Thurlow & Brown, 2003). Because text messages are written in an unregulated

space, a space where writing errors are common, students who frequently use text messaging could potentially write and send a high frequency of incorrectly written sentences. The question then is whether students' text-messaging habits can hinder their ability to correctly punctuate sentences. The theoretical framework that underpins this question is based upon ideas relating to self-regulation (Bandura, 1986), memory (Bartholomae, 1980; Flower & Hayes, 1981; Hayes, 1996; Hayes & Chenoweth, 2006; Kellogg, 2006), and transfer (Perkins & Salomon, 1992; Salomon & Perkins, 1989). This theoretical framework can help explain how students, when they write and send a high frequency of incorrect sentences, may demonstrate an inability to use correct punctuation in academic writing. The study therefore sought to determine the relationship between the text-messaging habits of college students and their ability to use punctuation in academic writing.

Thurlow (2006) clearly demonstrated the media's negative reaction to textese, and Crystal (2008) observed that "a huge popular mythology has grown up, in which exaggerated and distorted accounts of what youngsters are believed to do when they text has fuelled prophecies of impending linguistic disaster" (p. 7). Illustrating this, a United Kingdom periodical showed the continued concern of the media: "Twitter and Text Are not GR8 for English Skills, Warns Head" (Woolcock, 2014). Alongside this apprehension, researchers studied the relationship between participants' use of text messaging (and instant messaging) and their literacy. The elements of literacy that researchers have studied are spelling (Plester, Wood, & Bell, 2008; Powell & Dixon, 2011; Varnhagen et al., 2010; Wood, Jackson, Hart, Plester, & Wilde, 2011), reading (Coe & Oakhill, 2011; Kemp & Bushnell, 2011), and writing (Rosen, Chang, Erwin, Carrier, & Cheever, 2010; Shafie, Azida, & Osman, 2010; Wardyga, 2012). Researchers who studied written literacy have given insufficient treatment to the relationship

between participants' text-messaging habits and their ability to punctuate sentences in academic writing.

A few studies have reported a negative correlation between text-messaging habits and literacy. Though Drouin and Driver (2014) reported that frequency of textese had a negative correlation to participants' literacy, the researchers did not correlate their data to punctuation. An earlier study by Rosen et al. (2010) also reported a negative correlation between participants' text-messaging habits and literacy, but the researchers focused on the participants' writing ability based upon a number of criteria, not just punctuation. It was found that "those without any college education and those with some college who reported using more shortened words in their electronic communications had worse formal writing" (p. 432). Such studies provided a gap in which to conduct further research.

More theoretical support is needed to explain the relationship between text messaging and literacy. Drouin and Driver (2014), for example, did not provide a theoretical explanation for their results; Rosen et al. (2010), on the other hand, used the theoretical framework of the "Low-Road/High-Road Transfer of Situated Learning Theory" (pp. 424, 434-435). The researcher for the present study used ideas related to self-regulation (Bandura, 1986), memory (Bartholomae, 1980; Flower & Hayes, 1981; Hayes, 1996; Hayes & Chenoweth, 2006; Kellogg, 2006), and transfer (Perkins & Salomon, 1992; Salomon & Perkins, 1989) to explain the relationship between text messaging and punctuation errors in academic writing. Students' self-regulation, for example, can be influenced by their self-observation and personal standards (Bandura, 1986), qualities that closely apply to their writing, whether in text messaging or in an academic setting. Self-regulation, along with ideas related to memory and learning transfer, can

help explain why some students who write in the unregulated space of text messaging may demonstrate incorrect punctuation in regulated space of academic writing.

Problem Statement

The problem is that limited research exists about how the text-messaging habits of college students relate to their use of punctuation in academic writing. Emphasizing college students' punctuation skills is necessary because many researchers have not analyzed punctuation when they examined how text messaging relates to literacy. For example, when Rosen et al. (2010) correlated participants' use of text-messaging habits to their writing quality, the researchers defined writing quality by a rubric that appeared to include punctuation (i.e., "mechanics," p. 427). Shafie et al. (2010) examined text-messaging language (i.e., textese) as it relates to academic writing but did not make detailed observations about the participants' use of punctuation. Instead, the researchers observed that "there appeared to be many spelling and grammatical errors" (p. 30). Wood, Kemp, Waldron, and Hart (2014) examined the correlation between grammatical violations found in text messages and the understanding participants have of grammar. Though the researchers examined punctuation, they examined punctuation as it was found in text messages as opposed to academic writing. Because such studies did not emphasize participants' punctuation in academic writing, a more detailed study is needed.

Purpose Statement

The purpose of the study is to examine the relationship between the text-messaging habits of college students and the frequency of punctuation errors in their academic writing. Based upon previous studies, a quantitative correlational design is appropriate for this study. Though a correlational design does not "determine the causes of relationships" (Fraenkel & Wallen, 2000, p. 359), such a design can show the direction and strength of the relationship between variables

(Creswell, 2005). The predictor variables are the frequency of text messaging (Rosen et al., 2010) and the frequency of textese (Thurlow & Brown, 2003). *Text-messaging frequency* is defined as the average number of text messages sent (Rosen et al., 2010) within a five-day period (Grace, Kemp, Martin, & Parrila, 2014), as opposed to the number of text messages both sent and received (Wardyga, 2012). *Textese* is informal writing conventions used in text messages, such as the abbreviation of words (Crystal, 2008); and *textese frequency* is defined as the number of informal writing conventions divided by the number of words within a participant's text messaging writing sample (Drouin & Driver, 2014; Grace et al., 2014). The criterion variable is the frequency of punctuation errors in an academic writing sample. *Punctuation errors* are deviations from punctuation conventions defined by Turabian's *Manual for Writers* (2013). The *frequency of punctuation errors* is defined as the number of punctuation errors divided by the number of words in a participant's writing sample. To obtain the data, the researcher used a convenience sample of 115 college students from a four-year college in the Southeast United States. After data were collected via a survey, writing samples, and content analyses, a multiple regression analysis was used to correlate the predictor variables (frequency of text messaging and frequency of textese) to the criterion variable (punctuation errors in academic writing).

Significance of the Study

This study is significant because it adds additional empirical evidence to the relationship between text-messaging habits and literacy. Though researchers have focused on textese, text messaging, and literacy among college students (Drouin, 2011; Drouin & Davis, 2009; Powell & Dixon, 2011; Shafie et al., 2010), none cited in this study have analyzed the relationship of text-messaging habits to a person's use of punctuation in formal writing contexts.

It is important to give more attention to punctuation errors because they are frequent in college-student writing. Conners and Lunsford (1988), in their analysis of 3,000 college-student papers, ranked "no comma after introductory element" (p. 403) as the most frequent error. Of the 20 errors that Conners and Lunsford analyzed, they found that comma errors (including the fragment and comma splice) accounted for 9 of the 20 errors. Lunsford and Lunsford (2008), revisiting the study of Conners and Lunsford (1988), also revealed that 9 of the 20 most frequent writing errors are punctuation errors. In Sloan's (1990) analysis of college and professional writing, comma errors (not including the comma splice) ranked as the second highest in frequency (p. 302). Though these studies occurred before the popularity of text messaging, these studies show that college students struggle using correct punctuation. Now that text messaging is all but ubiquitous among college students, it is significant to study how text-messaging habits may impede the mastery of formal writing conventions.

Not only is this study significant for the research community but it is also significant for composition teachers. To teach students Standard English, teachers have been encouraged to accommodate students' dialectical or informal use of language in the classroom (Crotteau, 2007; Martinez, 2010; Turner, 2009). Turner (2009), for example, suggested that students could learn about audience-appropriate writing from code-switching between textese and Standard English. Though such an exercise may help students know that using emoticons or nonstandard abbreviations in research papers is inappropriate, it does not directly address how students should use commas based upon the syntax of a sentence. Though accommodating students' dialect or informal language may help to teach about audience-appropriate writing, it is possible that accommodating textese or another language variety could hinder Standard English in more subtle ways.

College graduates are another group of stakeholders who could benefit from this study. Possessing a repertoire of writing skills is helpful for anyone seeking employment. In seeking to discover how business people judge another's ethos based upon writing errors, Beason (2001) exposed his participants to five types of errors, three of which dealt with missing punctuation or misapplied punctuation (fragments, fused sentences, and overuse of quotation marks). Beason observed that all participants responded via a questionnaire that all five errors were either "somewhat bothersome" or "definitely bothersome" (p. 41). Beason (2001) effectively described the consequences that writing error can bring, especially as it pertains to the writer: "Errors create misunderstandings of the text's *meaning*, and they harm the *image* of the writer (and possibly the organization to which the writer belongs)" (p. 48, emphasis in the original). Jones (2011) reported that employers expect accounting majors to possess writing skills such as "writing clearly and precisely," "spelling correctly," and "using correct grammar" (p. 254). Another skill that employers considered "very important" was punctuation (p. 258), a skill that ranked 13 out of 26 communication skills (p. 256). Although punctuation was not the top skill for accounting majors, it was nonetheless considered an important skill among employers. Correct writing, as important as it is for an academic setting, has real-world relevance and should thus be taken seriously by students. It is significant for college students to know whether a writing practice such as text messaging is negatively associated with punctuation error because college students, whether during college or after college, will be required to know the conventions of Standard English.

Research Question

The research question for the study is the following:

RQ1: How accurately can frequency of punctuation errors in academic writing be predicted from a linear combination of frequency of text messaging and frequency of textese for college students?

Null Hypothesis

The hypothesis for the study is the following:

H_01: There will be no significant predictive relationship between the criterion variable (frequency of punctuation errors) and the linear combination of predictor variables (frequency of text messaging and frequency of textese) for college students.

Definitions

Code-switching—The ability that a person has to switch between two languages or language varieties (Romaine & Kachru, 1992; White, 2011). Code-switching is best seen when a bilingual speaker shifts from one language to another; it can also apply to the writing styles that students adopt, whether switching between a regional English dialect and Standard English (Crotteau, 2007) or between textese and Standard English (Turner, 2009).

Error—Any deviation from Standard English, whether in spelling, punctuation, or syntax (see Bartholomae, 1980). Lunsford and Lunsford (2008), for example, considered such items as "wrong word," "faulty sentence structure," and "poorly integrated quotation" as error (p. 795).

Literacy—A person's "ability to read and write in at least one language" (Bailey, 1992, p. 613). For the present study, the term will include the skill of punctuation since punctuation is a "practice in writing and print of using a set of marks to regulate texts and clarify their meanings" (Allen & McArthur, 1992, p. 824).

Punctuation—According to Garner (2009a), "is the cuing system by which writers signal their readers to slow down, pause, speed up, supply tonal inflections, and otherwise move more smoothly through sentences" (p. 674). Common punctuation marks are commas, semicolons, and dashes (APA, 2010; MLA, 2008; Turabian, 2013).

Register—The way in which language can be used based upon social context, "such as scientific, formal, religious, and journalistic" (Crystal, 1992, p. 859). For the present study, text-messaging language ("textese") will be considered a type of language register.

Self-regulation—An element of Bandura's (1986) social cognitive theory, it centers on the standards that people possess and that are used to evaluate and to influence their behavior.

Standard English—According to Garner (2009b), Standard English is "broadly speaking . . . the English used by educated people" (p. 771). Algeo (2010) explained that a quality of a standard language is that it "enjoys high prestige—one that people regard as 'good' language" (p. 195).

Textese—The informal writing used in digital communication: e-mail, instant messaging, text messaging, and social networking sites (Drouin, 2011; Varnhagen et al., 2010). Crystal (2008), focusing specifically on text messaging, classified textese according to the following terms: "pictograms and logograms" (p. 37), "initialisms" (p. 41), "omitted letters" (p. 45), "nonstandard spellings" (p. 48), and "shortenings" (p. 50). Textese can also include elements such as using lowercased letters and omitting punctuation (Drouin, 2011).

Text-messaging frequency—The number of text messages sent by participants (Rosen et al., 2010) within a five-day period (Grace et al., 2014) as opposed to the number both sent and received (Wardyga, 2012).

CHAPTER TWO: LITERATURE REVIEW

Overview

The researcher sought to determine the predictive relationship between the text-messaging habits of college students and their ability to use punctuation in academic writing. It is important to examine college students' use of punctuation because it is a writing convention that students have difficulty mastering, as seen by the research of Conners and Lunsford (1988) and Lunsford and Lunsford (2008). Challenging the use of correct punctuation is text messaging, a form of communication popular with young adults (Smith, 2011) and one in which users can adopt textese, a type of nonstandard English (Drouin, 2011). This literature review is composed of the theoretical framework, the literature which relates to the variables of this study, and the summary.

Theoretical Framework

Writing requires people to demonstrate knowledge about a subject; to present that information in an organized fashion; and to observe conventions such as spelling, mechanics, and formatting. Hayes (1996) described writing as "[depending] on an appropriate combination of cognitive, affective, social, and physical conditions if it is to happen at all" (p. 5). Adding to the complexity of the writing act is the ability that writers have to *code-switch*, an ability to adjust their communication based upon their audience. According to Romaine and Kachru (1992), "a *code* may be a language or a variety or style of a language . . . and the term *code-switching* emphasizes movement from one language to another" (p. 228, emphasis in the original). Though code-switching can pertain to the switching between two languages, such as from English to Spanish, it has also been applied to switching between two registers or styles, such as from textese to Standard English (Turner, 2009). Lunsford and Lunsford (2008), for

example, "found almost no instances of IM [instant messaging] terms" in 877 papers, and they

explained this finding accordingly: "The students in this sample seemed aware of the ancient

principle of *kairos* and wrote with a sense of what is appropriate for formal college writing" (p.

799). Supporting the observation that college students know how to switch their writing style,

Drouin and Davis (2009) found that the majority of their sample understood that textese was

acceptable in informal contexts, "whereas only 6% of the sample indicated that it was

appropriate to use text speak in written communication with instructors" (p. 57). It can be

concluded from these findings that students who use textese while text messaging may possess

both the sense and the skill to use an appropriate register or style when writing for class. Though

code-switching may explain why Lunsford and Lunsford (2008) found insignificant evidence of

instant-messaging language, it does not explain why Lunsford and Lunsford found 8,088

punctuation errors in 877 papers (p. 795).

Self-Regulation

Bandura's (1986) theory of self-regulation, which is part of his social cognitive theory,

can help researchers understand the negative relationship between text messaging and literacy.

Code-switching fails to explain how students struggle to apply correct punctuation in formal

contexts, but social cognitive theory helps to explain how students' inability to punctuate could

result from their inability to self-regulate their writing habits. Social cognitive theory agrees

with the study because, as writing is a complex act, social cognitive theory recognizes the

personal, behavioral, and environmental determinants that influence a person's behavior

(Bandura, 1986). Though observational learning, abstract modeling, and self-efficacy are

elements of social cognitive theory, the element of social cognitive theory that best supports the

research question of the study is self-regulation.

Self-regulation, according to Bandura (1986), is more than sheer willpower but rather the result of internal processes and external factors, processes and factors that agree with the study. Self-regulation aligns itself with the relationship between text-messaging habits and writing ability because self-regulation explains how the attitudes that a person has and the environment that a person is in can predict certain behavior. As for the internal processes of self-regulation, students can experience poor self-regulation when they lack the function of self-observation, the function of being "inattentive to relevant aspects of their behavior" (p. 336). Because the writing environment of text messaging is unregulated, it is possible that a person, when sending a message, may be inattentive to the finer points of Standard English, such as spelling, capitalization, and punctuation. Complicating this, college students who write in the unregulated space of text messaging are also required to adhere to the conventions of Standard English in the regulated space of academic writing. The researcher therefore will explore whether college students who show inattentiveness in their text messaging will also show inattentiveness or lack of skill development in their academic writing, namely in their use of punctuation.

Self-observation, though, may not be enough to enable students to punctuate correctly. Bandura explained,

But self-observation has, at best, only transient effects on behavior that is highly resistant to change. Optimal goals, powerful self incentives [*sic*], and other self-regulatory aids must be brought to bear on refractory behavior if self-directed efforts are to succeed. (p. 339)

Though self-observation is an important element of self-regulation, those who want to improve their behavior must do more than to merely observe themselves: they must also have a strategy to accomplish the behavioral change. Bandura showed that another internal process of self-

regulation is a person's judgmental processes or personal standards. A student, when writing in an academic environment, can have personal standards regarding his or her writing performance (see Bandura, 1986, p. 336); but when text messaging in an unregulated space, that same student could have a different personal standard (such as a lack of standards or an informal style of writing), for the messages sent. In other words, a student, based upon his or her writing audience, could demonstrate a greater or lesser adherence to Standard English; and it is this inconsistent practice of Standard English that could create unnecessary errors in the student's academic writing. Showing the influence upon personal standards, Bandura asserted that "people form standards for judging their own behavior partly on the basis of how significant persons in their lives have reacted to it" (p. 340). When students write for the dual audiences of teachers and friends, it is possible that the only reaction students receive regarding their writing quality comes from their teachers as opposed to their friends. Bandura recognized that instruction must be thorough in order for the instruction to be transferred. He provided an analogy that applies itself to writing and thus to the present study: "If parents preach altruism but pay no attention to how their children treat others, the precepts soon lose their force" (pp. 340-341). Though English teachers instruct students to use correct punctuation, teachers can provide feedback only on those writing assignments required for class. When students text, they write for a different audience and for different purposes, sending messages that may not receive feedback for improvement. Bandura stated, "In many instances . . . instruction is ineffective for transmitting performance standards because it is accompanied by inconsistent or inadequate follow-through" (p. 341). With the dual genres and dual audiences that students write for, students may find it difficult or unnecessary to demonstrate self-regulation when writing in the

unregulated space of text messaging, and thus the finer points of Standard English, such as correct punctuation, are not adhered to in students' academic writing.

Memory

Practicing self-regulation in writing is important because the writing act can be influenced by a person's memory (Bartholomae, 1980; Flower & Hayes, 1981; Hayes, 1996; Hayes & Chenoweth, 2006; Kellogg, 2006). Though a person's ability to speak is a naturally acquired skill, learning to write must be learned (Algeo, 2010). Non-speech conventions such as punctuation must then be learned, and thus a person's failure to recall such conventions can be the cause of writing error (Bartholomae, 1980). Flower and Hayes (1981) suggested that written Standard English is influenced by a person's memory; and if the writing task is too cognitively demanding (i.e., for "inexperienced writers"), the writer could create writing errors by choosing to focus on global instead of local concerns in the writing task (p. 373). It is a person's working memory that applies itself to skills that have not become automatic for the writer (Hayes, 1996); therefore, working memory could apply to a person's knowledge of punctuation and the ability to use it. Because writing requires a student to perform a number of tasks that could tax his or her working memory (Kellogg, 2006), it is possible that if punctuation is not memorized or automatic, it becomes one more task that could further tax the writer's working memory and thus lead to punctuation errors. Ericsson, Krampe, and Tesch-Römer (1993) asserted "that the amount of time an individual is engaged in deliberate practice activities is monotonically related to that individual's acquired performance" (p. 368). Applying this principle of "expert performance" (Ericsson et al., 1993, p. 363) to writing conventions, if students are not self-regulating by practicing correct punctuation when they write the most, such as in unregulated spaces, that lack of skill will be evident in genres where that skill is required and expected.

Transfer of Learning

A theory that complements the principles of self-regulation, practice, and automaticity is the transfer of learning theory. Rosen, Chang, Erwin, Carrier, and Cheever (2010), for example, used the learning transfer theory of Salomon and Perkins (1989) to justify their study on text messaging and literacy. Based in part on this theory, Rosen et al. (2010) hypothesized that "those young adults who report using more textisms . . . will produce . . . worse formal writing due to the similarities between informal writing and text messaging and the disparity between formal writing and text messaging" (p. 424). The results of Rosen et al. (2010) appear to support the learning transfer theory in that the researchers found that "those . . . who reported using more shortened words in their electronic communications had worse formal writing" (p. 432).

The transfer of learning theory of Salomon and Perkins (1989) and also of Perkins and Salomon (1992) provides a basis for the apprehensions of parents and educators regarding textese. Salomon and Perkins (1989) divided their theory according to low-road transfer and high-road transfer. Low-road transfer is exhibited when "a cognitive element is learned and practiced in a variety of contexts until it becomes quite automatic and somewhat flexible because of variety" and is characterized by "*varied practice*" and "*automaticity*" (p. 120, emphasis in the original). Applying low-road transfer to punctuation, it would seem that placing a period at the end of a sentence is automatic for most college students. High-road transfer, on the other hand, is characterized by "mindful abstraction" (p. 124), a quality which is "the deliberate, usually metacognitively guided and effortful, decontextualization of a principle, main idea, strategy, or procedure, which then becomes a candidate for transfer" (p. 126). Other elements of punctuation—such as commas, hyphens, dashes, apostrophes, semicolons, and colons—could perhaps fall into this category of transfer. Based upon the syntax and intent of the writer, a

sentence could be punctuated in different ways, namely, the writer must mindfully abstract what he or she knows about punctuation to a unique situation.

Perkins and Salomon (1992) also divided transfer according to positive and negative transfer. Of the two types, negative transfer aligns itself with studies on text messaging and literacy. The authors explained that "negative transfer occurs when learning in one context impacts negatively on performance in another" (p. 4). They used the example of second language learners, those who "commonly assimilate a new language's phonetics to crude approximations in their native tongue and use word orders carried over from their native tongue" (p. 4). The researchers however qualified negative transfer by stating that "negative transfer typically causes trouble only in the early stages of learning a new domain" and can be corrected "with experience" (p. 4). Negative transfer aligns itself with the topic of text messaging and literacy because the poor writing habits of those who use textese would seem to negatively transfer in their academic writing. College students have had academic "writing experience" and thus should demonstrate a level of competence in punctuation. College students who use textese also have "writing experience" with an informal register, and this experience could thus interfere with the transfer of correct punctuation expected in academic prose.

Though code-switching explains how some students can shift between informal and formal genres of speaking and writing, it does not explain why text-messaging habits have negatively correlated to literacy, as reported in studies such as Drouin and Driver (2014) and Rosen et al. (2010). The ideas related to self-regulation (Bandura, 1986), memory (Bartholomae, 1980; Flower & Hayes, 1981; Hayes, 1996; Hayes & Chenoweth, 2006; Kellogg, 2006), and transfer (Perkins & Salomon, 1992; Salomon & Perkins, 1989) help explain how text messaging could negatively correlate to a person's literacy. When students do not self-regulate when

writing in the unregulated space of text messaging, students find it difficult to memorize basic writing conventions such as punctuation and thus students cannot effectively transfer their knowledge of punctuation to unique writing scenarios.

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Text-Messaging Habits

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Text-Messaging Frequency

Researchers have analyzed the text-messaging habits of both children and adults and have analyzed those habits according to text-messaging frequency and according to textese. As for text-messaging frequency, researchers who have used child and adult participants have gathered this information via self-report measures, such as surveys and questionnaires (Coe & Oakhill, 2011; De Jonge & Kemp, 2012; Drouin, 2011; Drouin & Driver, 2014; Grace, Kemp, Martin, & Parrila, 2014; Kemp & Bushnell, 2011; Plester, Wood, & Bell, 2008; Plester, Lerkkanen, Linjama, Rasku-Puttonen, & Littleton, 2011; Rosen et al., 2010; Shaw, Carlson, & Waxman, 2007; Wood, Kemp, Waldron, & Hart, 2014). These researchers, however, differ in how they had participants report text-messaging frequency. Some researchers had participants report the number of text messages sent per day (Coe & Oakhill, 2011; De Jonge & Kemp, 2012; Grace et al., 2014; Kemp & Bushnell, 2011; Plester et al., 2008; Wood et al., 2014) while other researchers had participants report the number sent per month (Drouin & Driver, 2014; Rosen et al., 2010). Drouin (2011) is unique in that the participants were to report text-messaging frequency according to a six-point Likert scale. An early study on text messaging, Shaw et al. (2007) had participants report their frequency according to their sending text messages "once a day, approximately 10 times a day, once a week, 3-4 times a week" (p. 62). Plester et al. (2011) followed a similar line of questioning.

A limitation in having participants report their text-messaging frequency is inaccuracy. Rosen et al. (2010) observed that the adult participants' "recall could be faulty" (p. 436); Kemp and Bushnell (2011), in their study with child participants, made a similar observation. Rosen et al., therefore, suggested such information could be obtained from the participants' cellular phone billing statements. Wardyga (2012) used billing statements in order to have a more accurate average of text-messaging frequency. Though such a method appears promising, a researcher may experience the challenge of different cellular phone carriers reporting text-messaging activity differently. Furthermore, some participants may not have ready access to their cellular phone statements because they are not the ones financially responsible for the cellular phone plan. Skierkowski and Wood (2012) found that parents or guardians paid for the cell phone plans of nearly 70% of the college participants in their study.

Studies with adults have shown differing text-messaging frequencies. For daily text-messaging frequency, the statistical mean has been as low as 9.6 text messages sent per day (Wood et al., 2014) to a slightly higher 18 (De Jonge & Kemp, 2012) to an even higher 39.8 (Grace et al., 2014). When participants have been asked to report their text-messaging frequency per month, the statistical means have ranged from 588.69 (Rosen et al., 2010) to 1,788 (Drouin & Driver, 2014). Differences in these statistical means can only be surmised. Though it is true that the participants in Grace et al. (2014) were from Canada (who sent a mean of 39.8 text messages per day) and Australia (23.9 text messages per day), the participants' country may not be the determining factor. In the previously mentioned studies, participants have been from Australia (De Jonge & Kemp, 2012; Grace et al., 2014), Canada (Grace et al., 2014), the United Kingdom (Wood et al., 2014), and the United States (Drouin & Driver, 2014; Rosen et al., 2010). Though US participants in Drouin and Driver (2014) sent the most text messages, the Canadian

participants in Grace et al. (2014) sent more than the US participants in Rosen et al. (2010). These differences in means show, at the very least, the limitation of self-report measures.

To validate participants' text-messaging frequency, Wardyga (2012) collected cellular phone statements. His data were different from other studies because the means he presented included text messages both sent and received, whereas the previously mentioned studies showed the number of text messages sent. The statistical means that he reported for text messages sent and received are 2,051.4 (the two-month average before participants took the SAT) and 2,191.9 (the two-month average before participants took a college writing class). If participants sent the same number of texts that they received, the mean of text messages sent would be between the means reported by Rosen et al. (2010) and Drouin and Driver (2014).

The literature has shown that text-messaging frequency, as seen by the number of text messages sent by the participants, is a variable of interest among researchers. Though self-reports do possess the weakness of accuracy, all the published studies in this literature review had a self-report measure for determining the variable of text-messaging frequency. Surveying the means as a whole, it can be concluded that adults, most of whom are college students, send on average between 300 to 1,700 text messages per month.

Text Language Frequency

A second way that text-messaging habits have been analyzed is according to participants' use of textese. Like text-messaging frequency, researchers have analyzed the textese of both children and adults (Coe & Oakhill, 2011; De Jonge & Kemp, 2012; Drouin, 2011; Drouin & Davis, 2009; Drouin & Driver, 2014; Grace et al., 2014; Kemp & Bushnell, 2011; Plester et al., 2008; Plester, Wood, & Joshi, 2009; Rosen et al., 2010; Wood et al., 2014). The instrumentation used to collect this data has differed among studies. Some researchers have used a self-report

measure to obtain data regarding participants' use of textese (Drouin, 2011; Rosen et al., 2010).

Other researchers have asked for the participants to respond in writing to a prompt or scenario

(Coe & Oakhill, 2011; Plester et al., 2009). Still other researchers had participants rewrite a pre-

existing passage or a message that was dictated to them (De Jonge & Kemp, 2012; Kemp &

Bushnell, 2011; Plester et al., 2008). These methods have the limitation of gathering data that

are either inaccurate or inauthentic. Rosen et al. (2010), for example, considered it a limitation

that participants reported their use of textese. The researchers suggested that "a better approach

would be to transcribe students' text messages . . . and directly observe their daily use of

textisms" (p. 436). Other researchers have gathered naturalistic data, namely, the actual text

messages written by participants (Drouin & Driver, 2014; Grace et al., 2014; Wood et al., 2014).

Obtaining textese.

Those researchers who used writing prompts or had participants rewrite a passage have

the limitation of analyzing data that is not authentic. Certain researchers, however, achieved a

level of authenticity to their data by instructing participants to write a text message as they would

to a friend (De Jonge & Kemp, 2012; Kemp & Bushnell, 2011) or a family member (Coe &

Oakhill, 2011). Plester et al. (2009), in having participants respond to ten scenarios, did not

specify how participants were to write their text messages. Framing the texting task according to

a particular audience guards against participants' using more textese than they normally would

and thus provides the researcher with more authentic results.

How the texting task is framed could lead to inaccurate results. In an earlier study

conducted by Plester et al. (2008), the researchers instructed the participants to write in textese,

instructions that encouraged participants to use textese on purpose, regardless of how they

normally send text messages. As for De Jonge and Kemp (2012), they constructed Standard

English sentences for participants to translate in such a way as "to increase the scope for the use of textisms" (p. 53). Such methods by Plester et al. (2008) and De Jonge and Kemp (2012) do not ensure that the text-messaging data represent the actual texting habits of the participants.

The method that will most accurately capture participants' text-messaging habits is obtaining naturalistic data. As for the researchers who used naturalistic data, they did not obtain the actual text messages of their participants but rather obtained the messages that participants reported to have been on their phones. Though such instrumentation is more authentic than self-reports, rewriting, or responding to prompts, there is still the threat of inaccuracy because participants could transcribe incorrectly or select which text messages to report. To obtain naturalistic textese data, certain researchers instructed participants to transcribe previously sent text messages (Drouin & Driver, 2014; Grace et al., 2014; Wood et al., 2014). Of these three studies, Wood et al. (2014) differed the most in that the researchers asked the participants to transcribe "text messages that they had sent within a recent two-day period, exactly as they had written them" (p. 285). Wood et al. (2014) did not specify which "two-day period" of text messages they wanted to collect (p. 285). If participants sent as many as 40 text messages a day (see Grace et al., 2014), the participants would have to transcribe up to 80 text messages for the study.

Another method of collecting naturalistic data is found in Drouin and Driver (2014) and Grace et al. (2014). Both studies were similar in that the researchers asked participants to transcribe their five most recently sent text messages. To protect participants' privacy, Drouin and Driver (2014) instructed the participants to "[omit] all personal information such as names and phone numbers" (p. 256). To ensure that there was a large enough corpus of words to analyze, Grace et al. (2014) instructed the participants to transcribe additional messages if the

corpus did not equal 50 words. In both studies, the researchers were deliberate in instructing participants to ensure that their text-message transcriptions matched the messages found on their phone.

Classifying textese.

In order to measure the amount of textese that participants use in text messaging, it is necessary to articulate those characteristics that define textese. Broadly, textese is a register of English that is used in text messaging, instant messaging, social networking venues, and e-mail (Drouin, 2011; Rosen et al., 2010). In defining the characteristics of textese, the study of Thurlow and Brown (2003) is an influential work. Working from a corpus of 544 messages, Thurlow and Brown (2003) observed that textese is associated with "brevity and speed," a quality seen in "the minimal use of capitalization and standard, grammatical punctuation" ("The Sociolinguistic Maxims of SMS"). In their content analysis of the 544 messages, messages that represented recently sent and received text messages of 135 participants, they established six categories of "non-standard orthographic and/or typographic forms" ("'New' Linguistic Forms," para. 1). These six categories are significant because other researchers have used Thurlow and Brown's (2003) classifications. Some researchers (Coe & Oakhill, 2011; Grace et al., 2014; Plester et al., 2009) specifically attributed their classification system to Thurlow and Brown (2003); other researchers (De Jonge & Kemp, 2012) were indirectly influenced by the work of Thurlow and Brown (2003). Illustrating Thurlow and Brown's indirect influence on researchers, De Jonge and Kemp (2012) attributed their classification system to Plester et al. (2009), but the study of Plester et al. (2009) used the classification system of Thurlow and Brown (2003). Such evidence demonstrates that Thurlow and Brown (2003) is a landmark study regarding textese.

Though there are differences in how certain researchers such as Plester et al. (2008), Rosen et al. (2010), and Thurlow and Brown (2003) classified textese, these same researchers have points of agreement (see Table 1). For example, what Rosen et al. (2010) and Plester et al. (2008) classified as "acronyms" is classified by Thurlow and Brown (2003) as "initialisms." The "letter/number homophones" of Thurlow and Brown (2003) and Plester et al. (2008) were called "shortened words" by Rosen et al. (2010). One of the ways that Rosen et al. (2010) defined a shortened word aligns with Thurlow and Brown's (2003) category of "contractions." The "accent stylization" of Thurlow and Brown (2003) was called "youth code" in Plester et al. (2008). Of these three studies, Thurlow and Brown (2003) remains the most comprehensive. The categories provided by Thurlow and Brown (2003) are the following: "shortenings," "contractions," "g clippings," "other clippings," "acronyms," "initialisms," "letter/number homophones," "'misspellings' and typos," "non-conventional spellings," and "accent stylization." To show the adaptability of Thurlow and Brown's (2003) categories, Plester et al. (2009) used Thurlow and Brown's (2003) categories yet added a category called "missing apostrophes" (p. 155). Thurlow and Brown's (2003) categories could be even more comprehensive if a researcher added categories from Rosen et al. (2010), such as the "lowercase 'i'" (p. 432) and the use of all capital letters, and from Plester et al. (2008), such as the use of symbols.

Though Thurlow and Brown (2003) did not specifically make punctuation a category in his content analysis, text messaging creates a writing atmosphere in which correct punctuation is de-emphasized and is not needed to communicate a message (Thurlow & Brown, 2003). Demonstrating this, Wood et al. (2014) classified the number of grammatical deviations (not

textese) found in their sample of text messages. Of the grammatical errors found, the mean

scores for punctuation and capitalization errors were higher than the other error categories

Table 1

Textese Classification Presented in Three Studies

Thurlow & Brown (2003)	Rosen et al. (2010)	Plester et al. (2008)
accent stylization		youth code
acronyms	acronyms	
contractions		
g clippings		
initialisms		acronyms
other clippings		
letter/number homophones		letter/number homophones
misspellings and typos		
nonconventional spellings		phonological reductions
shortenings	shortened words	
	lowercase "i"	
	no apostrophe	
	Emoticons	
	all capital letters	
	special characters	
		symbols

for all three groups of participants. Based upon Thurlow and Brown (2003) and Wood et al.

(2014), missing and/or misused punctuation could be a category that a researcher adds to his or

her content analysis of textese. By including punctuation, a researcher can better determine the level of participants' self-regulation between two registers of writing.

Of those studies about textese, some researchers provided what types of textese were the most frequent. Plester et al. (2009), who used child participants exclusively, found that the most frequent types of textese were "contractions," "non-conventional spellings," "accent stylization," and "letter/number homophones" (p. 154). Coe and Oakhill (2011), who also used child participants, found that "letter/number homophones" were the most frequent use of textese (p. 10). For those studies that used college participants either exclusively or included college participants with secondary students, "accent stylisation" (Drouin & Driver, 2014, p. 258), "omitted apostrophe" (De Jonge & Kemp, 2012, pp. 57, 59; Drouin & Driver, 2014, pp. 257-258), and "omitted capitalisation" (De Jonge & Kemp, 2012, pp. 57, 59; Drouin & Driver, 2014, pp. 257-258) were the most frequent uses of textese. As for the density of textese per participant, Drouin and Driver (2014) reported 28% textese density and Grace et al. (2014) reported 16-19% textese density. As for differences between males and females, Drouin and Driver (2014) and De Jonge and Kemp (2012) did not find one gender group using significantly more textese than the other.

In categorizing textese, the most relevant studies that included college students did not establish mutually exclusive categories for individual instances of textese (De Jonge & Kemp, 2012; Drouin & Driver, 2014; Grace et al., 2014). According to Drouin and Driver (2014), the word *ive* would be classified twice, once as "missing an apostrophe" and once as "missing capitalisation" (p. 256). Having categories that are mutually exclusive is integral to a content analysis (Gall, Gall, & Borg, 2007). Achieving mutually exclusive categories, Plester et al. (2009) established the procedure of classifying each instance of textese based upon "the first

change made" (p. 151). In addition to not establishing mutually exclusive categories, another commonality is that not all the researchers reported whether they established interrater reliability for their content analyses (De Jonge & Kemp, 2012; Drouin & Davis, 2009; Grace et al., 2014), an omission that could limit the usefulness of the data reported. One study, however, showed its interrater reliability (Drouin & Driver, 2014), and the interrater reliability for the content analyses was high: 98%.

Text Messaging and Literacy

Most researchers who have examined text messaging in the context of participants' literacy have done so in terms of analyzing (solely or in combination with) participants' reading, spelling, and vocabulary (Coe & Oakhill, 2011; De Jonge & Kemp, 2012; Drouin, 2011; Drouin & Davis, 2009; Drouin & Driver, 2014; Grace et al., 2014; Kemp & Bushnell, 2011; Plester et al., 2008; Plester et al., 2009; Plester et al., 2011; Powell & Dixon, 2011; Wood, Jackson, Hart, Plester, & Wilde, 2011; Wood et al., 2014). Some studies have reported a positive relationship between text messaging and literacy (Coe & Oakhill, 2011; Drouin, 2011; Plester et al., 2008; Plester et al., 2009; Powell & Dixon, 2011; Wood et al., 2011); others have reported a negative relationship (De Jonge & Kemp, 2012; Drouin & Driver, 2014; Grace et al. 2014; Plester et al., 2008); still others have reported no relationship (Drouin & Davis, 2009; Kemp & Bushnell, 2011; Plester, 2011). Upon closer analysis, those studies that reported a positive relationship had children as participants; a negative relationship was reported in those studies that had adults as participants (see Drouin & Driver, 2014).

Positive Relationship between Text Messaging and Literacy

Of the six studies that reported a positive relationship between text messaging and literacy, four had children as participants. Coe and Oakhill (2011) reported that good readers

used more textese than poor readers. Such a report agrees with Plester et al. (2009), whose study

reported a significant positive relationship between the use of textese and reading ability. In

Plester et al. (2008), though the researchers reported a negative correlation between text-

messaging frequency and nonverbal reasoning, they also reported that "there was a significant

positive association between proportion of textisms used and the children's verbal reasoning

scores" (p. 139). Further solidifying the positive relationship textese has to children's literacy,

Plester et al. (2008) reported that a higher frequency of textese is positively related to the

participants' spelling. Last, Wood et al. (2011) reported that "mean textism use . . . was

significantly associated with most of the literacy skills at pre- and post-test" (p. 33). As it comes

to text-messaging habits, researchers have reported that textese, as opposed to text-message

frequency, is positively associated with children's literacy.

Drouin (2011) and Powell and Dixon (2011) used college students as participants, and

their studies reported a positive relationship between text messaging and literacy. Whereas

studies with children reported a positive relationship between textese and participants' reading

and spelling, Drouin (2011) reported that "text messaging frequency was . . . significantly and

positively related to spelling . . . and reading fluency" (p. 71). Powell and Dixon (2011),

focusing on spelling exclusively, reported that "improved spelling scores appeared to follow

exposure to textisms" (p. 61). Though these studies may appear to provide similar findings to

that of children, Drouin (2011) determined text-messaging frequency and the frequency of

textese from a Likert-scale self-report. By contrast, Drouin and Driver (2014) reported that "text

message frequency was not significantly related to any measure of literacy" (p. 259). A

difference between Drouin (2011) and Drouin and Driver (2014) is that Drouin and Driver

(2014) obtained information for text-messaging frequency, not from a Likert-scale self-report,

but rather by using a self-report that required participants to provide how many text messages they send on a monthly basis. Powell and Dixon (2011) were also different from Drouin and Driver (2014) in that their study did not report participants' text-messaging habits but rather reported how their exposure to reading textese influenced their spelling ability.

Negative Relationship between Text Messaging and Literacy

Three studies that reported a negative relationship between text messaging and literacy are De Jonge and Kemp (2012), Drouin and Driver (2014), and Grace et al. (2014). Whereas studies with children reported a positive relationship between textese and participants' reading and spelling, Drouin and Driver (2014) reported a negative relationship in their study with college students. Grace et al. (2014) also reported a negative relationship between textese and participants' spelling. Though De Jonge and Kemp (2012) were slightly different because their results included both high school students and college students, they too reported a negative correlation between textese and participants' spelling and reading.

As for the relationship between text messaging and literacy, few researchers have dealt with text-messaging habits in relationship to participants' writing ability (Plester et al., 2008; Rosen et al., 2010; Tayebinik & Puteh, 2012; Wardyga, 2012), thus identifying a gap in the literature. Of the four studies previously mentioned, only two (Rosen et al., 2010; Tayebinik & Puteh, 2012) addressed the topic of punctuation, though no analysis of the frequency and types of punctuation errors were given. As for Rosen et al. (2010), the writing ability of the participants was scored via a rubric, with punctuation most likely being assessed under the category of "grammar, usage, and mechanics" (pp. 427-428). Rosen et al. (2010) did not provide a content analysis of the type of errors committed. Tayebinik and Puteh (2012), a qualitative study, illustrated rather than measured the problem that participants may have with punctuation.

In this study, students admitted to using textese in academic contexts. As one participant said, "Usually I forget proper punctuation in exams" (p. 103). Such an observation agrees with that of Drouin and Davis (2009): "More than half of the students . . . indicated that they thought that the use of text speak makes it difficult to remember SE [Standard English]" (p. 64). Such observations support the theoretical framework of the present study, namely, that when students fail to self-regulate by using correct writing conventions in text messages, the automaticity of punctuation skill is hindered and thus students are unable to transfer what they know about punctuation to their own standard formal writing.

The studies that relate text-messaging habits to writing are Rosen et al. (2010) and Wardyga (2012). These researchers analyzed writing samples in different ways. Whereas Rosen et al. (2010) made use of formal and informal writing samples (written solely for the study), Wardyga (2012) made use of SAT writing scores. Wardyga (2012), though much of the study failed to report significant correlations, did report that female participants demonstrated a negative correlation between their text-messaging frequency and Scholastic Aptitude Test (SAT) writing scores. As for the formal writing samples in Rosen et al. (2010), a negative correlation was reported between formal writing scores and textese (which were self-reported by the participants). Specifically, 18.89% of participants self-reported using a lowercase "i," and 6.29% self-reported not using an apostrophe. Between Wardyga (2012) and Rosen et al. (2010), the latter more strongly suggests that an adult's use of textese negatively relates to an adult's formal writing ability.

What distinguishes Rosen et al. (2010) from others is that "the current study examines actual writing samples, including a brief formal writing sample and a brief informal writing sample" (p. 423). Two of the three hypotheses in this study were that high-frequent texters "will

produce better informal writing but worse formal writing" and that "the actual use of textisms in writing will be low" (p. 424). The researchers reported in part the following: "More reported overall use of total linguistic textisms and specifically greater reported use of shortened words were related to *worse* formal writing" (p. 434). Though this observation appears to contradict the findings of Wardyga (2012), it should be noted that Wardyga (2012) did not deal with the frequency of textese used by his participants but rather their frequency of text messaging and how that frequency had no significance on the participants' "formal writing performance on the SAT writing section" (p. 105) and on the participants' final grades for their college class Writing I. Such a finding supports the theoretical framework of Rosen et al. (2010). Rosen et al. (2010) reported, "The negative impact of linguistic textisms supports the Low-Road Theory of Situated Learning, suggesting perhaps that the use of more linguistic textisms in daily writing might be carried over into actual, albeit simulated, writing samples" (p. 435).

Rosen et al. (2010) gathered their writing samples by having participants respond to two writing prompts. Rosen et al. (2010) recommended that authentic writing samples be used for future studies that focus on text messaging and literacy. The samples these researchers recommended should be "actual classroom writing assignments" (p. 436). With the exception of Shafie, Azida, and Osman. (2010), such instrumentation is rare when it comes to analyzing participants' writing in relationship to their text-messaging habits. Unlike Rosen et al. (2010) and Wardyga (2012), Shafie et al. (2010) analyzed "class assignments and examination scripts" for the presence of textese (p. 29). Shafie et al. (2010), however, did not show how they analyzed the data; thus the study lacks replicability.

Rosen et al. (2010) also sought to define good and bad writing; however, the individuals whom the researchers employed to rate the writing samples were "two college seniors with either

a major or subspecialization in English" (p. 428). The rubric used was originally intended for what the researchers called "the campus Graduation Writing Exam" (p. 428); that is, the rubric used was not specially designed to identify errors likely caused by or associated with textese. The rubric of Rosen et al. (2010) furthermore did not completely match the writing task assigned to the participants, who were asked to "write a letter to the company manager complaining about the quality of service that you received or the product itself and what you want them to do about it" (p. 425). The rubric instead described a superior composition as one that "demonstrates a thorough critical understanding of the passage in developing an insightful response" (p. 427). The project assigned and this particular rubric description did not match. Regardless, the correlation reported between textese and writing quality justifies further research on specific elements of writing quality, namely punctuation.

Punctuation

Punctuation is important because it can mitigate against "ambiguity or misunderstanding" (Allen & McArthur, 1992, p. 826). Unlike the grammar rules that describe speech, punctuation is an artificial rule system used exclusively for writing (Roberts, 1964). Because it is an artificial system, it must be memorized in order for it to be used with ease (Bartholomae, 1980; Flower & Hayes, 1981). On one hand, punctuation rules can be fluid and subjective; on the other hand, they can be objective, being consistently applied to sentences by writers. According to Dawkins (1995), punctuation can be influenced by the writer's intent or by the grammar of a sentence. According to Schou (2007), there is a debate whether punctuation is influenced by speech or whether it is influenced by grammar but concluded that "punctuation and its theory have moved towards an increasingly syntactic orientation" (p. 213). Though certain authors emphasized the

rhetorical nature of punctuation (Dawkins, 1995; Garner, 2009a), others emphasized its grammatical nature (Allen & McArthur, 1992; Greenbaum, 1996).

Though Dawkins (1995) is correct that one sentence can be punctuated in different ways, it is also true that style books for college students expect conformity to a set of basic punctuation rules. Turabian (2013), MLA (2009), and APA (2010) all prescribe rules for periods, commas, semicolons, colons, hyphens, apostrophes, dashes, parentheses, quotation marks, brackets, and slashes. Given this, there is shared knowledge of what defines proper punctuation. To further corroborate the nature of punctuation error, Conners and Lunsford (1988) and Lunsford and Lunsford (2008) can be used since they also included punctuation in their content analyses.

Style Guides and Punctuation

Turabian (2013), MLA (2009), and APA (2010) agree on the major marks of punctuation. Regarding comma rules, all three manuals prescribe that writers should use the Oxford comma when listing items in a series. They also agree that commas should be used with compound sentences, though Turabian (2013) and the MLA (2009) make an exception for short constructions. Other comma rules where there is unanimity deal with restrictive and nonrestrictive elements as well as with numerals with at least four digits (e.g., 3,368). All three style manuals also prescribe that commas should not be used between compound elements, such as compound subjects and compound verbs.

Of the three style manuals, Turabian (2013) and the MLA (2009) are the most developed in their treatment of punctuation. Turabian (2013) and the MLA (2009) agree that introductory elements, unless they are short, should be followed by a comma. Turabian (2013) and the MLA (2009) also agree that coordinate adjectives, when they are both clearly modifying the noun, should receive commas. Last, they prescribe that commas should be used with elements that are

parenthetical or that demonstrate contrast. Turabian (2013) and the MLA (2009) also emphasize the subjectivity of punctuation. For example, Turabian (2013) suggested that "a comma is not necessary after a short prepositional phrase unless the sentence could be misread without one" (p. 297). For a comma within a compound sentence, the MLA (2009) stated that "the comma may be omitted when the sentence is short and the connection between the clauses is not open to misreading if unpunctuated" (p. 67). (For a visual of the similarities and differences between style guides regarding commas usage, see Table 2.)

Table 2

Comma Rules Presented in Three Academic Style Books

Comma Rule Regarding	APA	MLA	Turabian
1. Compound sentence	X	X	X
2. Items in a series	X	X	X
3. (Non)restrictive elements	X	X	X
4. Digits (four or more)	X	X	X
5. Compound subjects and verbs	X	X	X
6. After year in complete dates	X	X	
7. Coordinate adjectives		X	X
8. Parenthetical element		X	X
9. Contrasting element		X	X
10. Introductory element		X	X
11. Explanatory element ("namely")			X
12. Between subject and verb		X	
13. Between verb and object		X	
14. Interjections			X
15. Conjunctive adverbs			X
16. Repeated words			X

As for colons and semicolons, the three style books are in agreement. All three agree that colons are to be placed after independent clauses and that colons should not separate verbs from their complements. Furthermore, they either state or illustrate colons preceding lists and other

explanatory information. Of the three, the APA (2010) does the best to define this application of the colon when it stated that the colon comes before "a final phrase or clause that illustrates, extends, or amplifies the preceding thought" (p. 90). Regarding semicolons, the three style guides prescribe that semicolons are to be used for compound sentences that do not use coordinating conjunctions and between items in a series when the items themselves use internal punctuation (such as between cities and states). Turabian (2013) also makes provision for using a semicolon for a long compound sentence with internal punctuation.

The use of hyphens for compound constructions is difficult to predict because some compounds are established in dictionaries and some are for the moment (APA, 2010). The rules governing the use of hyphens for compound words are not as established as those for commas, colons, and semicolons. Turabian (2013), for example, instructed its readers that "you will have to decide many individual cases on the basis of context, personal taste, or common usage in your discipline" (p. 286). Regardless, there are some common rules between the three style guides.

First, it is agreed that hyphenated compounds, when hyphenation is needed, usually precede the noun they are modifying (such as *coffee-drinking researcher*). Even with that basic guideline, there are some basic differences between the style guides. The APA (2010) recommended that if the compound uses an adjective in the comparative or superlative degree, the compound should remain open (such as *a less loved poem*). Turabian (2013) made an exception for a modifying adverb (such as *a very water stained book*). The style guides also prescribe that prefixes which are combined with proper nouns should also be hyphenated (such as *pro-American*). Last, the style guides recommend that prefixes which end with a vowel, if the vowel is repeated in the main word, should be hyphenated. Though this guideline seems easy enough, the style guides differ in the degree to which the rule is applied. Turabian (2013)

recommended that the hyphen should be used when repeated letters "might cause misreading" (p. 289). The MLA (2009) suggested the same. For the APA (2010), a provision is made for the prefixes *pre-* and *re-*, prefixes that are joined to the main word, regardless of its beginning letter.

Regarding apostrophes, there is general agreement among the three style guides. APA (2010), however, provides guidance only for proper names. Regardless, all three style guides follow the basic pattern: all singular nouns use -*'s*; plural nouns ending in –*s* use -*'*. Though the APA (2010) does not address plural nouns not ending in –*s*, the MLA (2009) and Turabian (2013) prescribe that -*'s* should be used. A major distinction between the APA (2010) and Turabian (2013) is how one is to use the apostrophe for names that end in –*s* but where the –*s* is not pronounced. APA (2010) recommends ending the name with an apostrophe; Turabian (2013) recommends ending the name with an –*'s*. Both the MLA (2009) and Turabian (2013) agree that apostrophes are not needed for plural numbers and plural abbreviations, but Turabian (2013) recommends that letters which are lowercased and plural should receive an -*'s*. These two style guides also agree on how to handle two possessive words preceding a noun: if there is individual ownership, the –*'s* goes after both modifiers; if there is joint ownership, the –*'s* is placed after the second word. Between the two, Turabian (2013) is more detailed, giving guidance on how to use the apostrophe for words such as *United States* and *sister-in-law*.

According to the three style guides, dashes can be used when the writer wants to provide, in the words of the APA (2010), "a sudden interruption in the continuity of a sentence" (p. 90). Other than cautioning the writer against relying too heavily on the dash, this is the only guidance that the APA (2010) provides. The MLA (2009) and Turabian (2013) provide other scenarios when dashes would be appropriate, such as for parenthetical items within parenthetical items (Turabian, 2013), "to set off an amplifying or explanatory element" (Turabian, 2013, p. 302), and

to "introduce a summarizing subject after a list of several elements" (Turabian, 2013, p. 302; see also MLA, 2009, p. 72). All three style guides agree regarding the dash, namely, there should be no space before and after each side of the dash itself.

As for parentheses, both the MLA (2009) and Turabian (2013) liken the use of parentheses to that of the dash, used to "set off explanatory or interrupting elements of a sentence" (Turabian, 2013, p. 303). The APA (2010), though not likening parentheses to dashes, prescribes that parentheses are used "to set off structurally independent elements" (p. 93). In its section on parentheses, the APA (2010) provides more scenarios for when parentheses are appropriate, such as for documentation, abbreviations, and enumeration.

Writing Samples and Punctuation

Though standards have been established for punctuation in style manuals such as Turabian (2013), MLA (2009), and APA (2010), punctuation errors are not easily mastered by students. Mann (2003) asked an intriguing question when she wrote, "If punctuation is so learnable, why do so many learn it so incompletely?" (p. 387). Regarding the teaching of mechanics, Weaver (1979) suggested that students can learn these when they are "seeking to meet the needs and demands of a real audience" (p. 66). Though such a strategy is sensible, it does not account for students' self-regulation, namely, that students' informal writing in one domain could hinder their correct writing in another. Furthermore, Weaver seemed to suggest that mere desire is enough to master an artificial skill such as punctuation, as opposed to consistent application of punctuation rules in a person's own authentic writing, a notion that does not take in to account expert practice (see Ericsson et al., 1993).

There have been researchers who have used authentic writing samples to analyze the writing of college students (Conners & Lunsford, 1988; Fallahi, Wood, Austed, & Fallahi, 2006;

Fernandes, 2012; Hooper & Butler, 2008; Kenkel & Yates, 2009; Kokaliari, Brainerd, & Roy, 2012; Lunsford & Lunsford, 2008; Quible, 2008; Sloan, 1990). Of these researchers, specific ones have analyzed the errors, including punctuation errors, of their participants by means of a content analysis (Conners & Lunsford, 1988; Fernandes, 2012; Kenkel & Yates, 2009; Lunsford & Lunsford, 2008; Quible, 2008; Sloan, 1990). Others have made use of rubrics (Hooper & Butler, 2008) and Likert scales (Fallahi, Wood, Austed, & Fallahi, 2006; Kokaliari, Brainerd, & Roy, 2012) to analyze participants' punctuation errors (Fallahi et al., 2006) or errors that could include punctuation, such as "grammar" (Kokaliari et al., 2012) or "correctness" (Hooper & Butler, 2008). Researchers who have used content analyses have shown that punctuation errors are frequent errors among college students. In Conners and Lunsford's (1988) landmark study, they found that a particular comma error ("no comma after introductory element") was the highest-ranked error of the twenty errors they analyzed (p. 403). Conners and Lunsford (1988) was revisited in Lunsford and Lunsford (2008), and the new study showed similar findings, with "missing comma after an introductory element" as the second most frequent error out of 877 papers, occurring 2,150 times. Other punctuation errors that occurred in this new list of twenty errors were "unnecessary comma," "missing comma with a nonrestrictive element," "missing comma in a compound sentence," "unnecessary or missing apostrophe," "fused (run-on) sentence," "comma splice," "unnecessary or missing hyphen," and "sentence fragment" (p. 795). Likewise, Sloan (1990) reported that comma errors ranked as the second most frequent error in his content analysis of student and professional writers (p. 302). Lunsford and Lunsford (2008) reported that for every 100 words, there was an average of 2.45 errors (p. 800).

In the Lunsford and Lunsford (2008) study, punctuation errors (including the comma splice) accounted for 36.1% of the total errors found in the papers analyzed (p. 795).

Surprisingly, this is a lower percentage than the Conners and Lunsford (1988) study, where punctuation errors accounted for 49.9% of total errors (p. 403). The reason for differences in numbers can only be surmised; however, Lunsford and Lunsford (2008) analyzed far fewer papers than Conners and Lunsford (1988): Lunsford and Lunsford's (2008) 877 papers compared to Conners and Lunsford's (1988) 3,000 papers. Though the percentage of punctuation errors dropped in Lunsford and Lunsford (2008), the same study also showed more "errors per 100 words": 2.45 compared to Conners and Lunsford's (1988) 2.26 (p. 800).

Conclusion

Text language is a phenomenon among college students and is of interest to scholars. The ideas related to self-regulation (Bandura, 1986), memory (Bartholomae, 1980; Flower & Hayes, 1981; Hayes, 1996; Hayes & Chenoweth, 2006; Kellogg, 2006), and transfer (Perkins & Salomon, 1992; Salomon & Perkins, 1989) provide a reasonable framework. Though studies with children have not produced solid evidence that text-messaging habits negatively correlate to children's literacy, studies with young adults have provided stronger evidence. An element of literacy that has not been addressed, however, is a person's ability to use punctuation in academic writing. Studies have shown that college students already struggle using punctuation correctly; therefore, it is relevant and appropriate to determine whether text-messaging habits are obstructing students' ability to learn the important skill of punctuating sentences.

The literature on text-messaging habits can help future studies in the following ways. First, future researchers may find it difficult to obtain a reliable monthly text-messaging average from their participants by using a mere self-report measure. Though obtaining such data from cellular phone statements appears the most reasonable method, obtaining text-messaging data from college students via their cellular phone statements, given the findings of Skierkowski and

Wood (2012), may prove difficult. Using a self-report measure to obtain text-messaging

frequency has been common practice for text-messaging studies, though the data obtained have

shown extreme monthly averages. A more reliable method of obtaining text-messaging

frequency is to have participants count the number of sent text messages on their cell phones

over the course of a number of days and from that report determine the daily average of text

messages sent. A method similar to this was used by Wood et al. (2014). In their study, they

asked participants to transcribe two-days' worth of text messages. Though this report was

primarily used to analyze participants' actual text messages, it is possible that the researchers

also obtained participants' daily average of sent text messages from this corpus of text messages.

Regardless, future studies would benefit from adapting Wood et al. (2014) or Grace et al. (2014)

as opposed to relying merely on the self-reports from participants. Second, the categorization of

textese should avoid unnecessary ambiguity and be as mutually exclusive as possible. Though

Thurlow and Brown (2003) provided a comprehensive list of textese categories, some of the

categories appear to overlap and thus could hinder interrater reliability between coders. For

example, a coder may be confused whether a word should be classified as an accent stylization

or a non-conventional spelling. Likewise, confusion may also occur over whether a contracted

word is also a misspelling. Using Thurlow and Brown (2003) as a guide, future researchers

should reduce and refine the textese categories so that coders can confidently perform content

analyses of participants' text messages. Third, future researchers may be surprised at the

infrequency of textese in a text-messaging corpus. Grace et al. (2014), for example, reported a

textese density of 16-19%; therefore, in a writing corpus of 50 words, a researcher may find only

8 instances of textese. If a future researcher can ensure that the content analysis is mutually

exclusive, the frequency of textese may be less. Fourth, based upon Lunsford and Lunsford

(2008), future researchers can expect to find at least 2 writing errors per 100 words, with roughly 35% of those errors being punctuation errors. Therefore, an essay of 1000 words could have on average 7 punctuation errors, or .7%.

CHAPTER THREE: METHODS

Overview

The purpose of the present study was to determine the predictive relationship between the text-messaging habits of college students and their ability to use punctuation in an academic setting. A multiple regression analysis was used to examine the relationship between the predictor variables of text-messaging frequency and the frequency of textese and the criterion variable of punctuation-error frequency. Chapter 3 will include a discussion of the design of the study, the research question, null hypothesis, participants and setting, instrumentation, procedures, and the data analysis.

Design

A correlational design was used to determine a relationship between text-messaging habits and punctuation errors. Text-messaging habits comprised two predictor variables: text-messaging frequency and textese frequency. *Text-messaging frequency* was the number of text messages sent (Rosen, Chang, Erwin, Carrier, & Cheever, 2010), and *textese frequency* was the number of informal writing conventions (see Crystal, 2008) divided by the number of words in a participant's text-messaging writing sample (Drouin & Driver, 2014; Grace, Kemp, Martin, & Parrila, 2014). The criterion variable, the *frequency of punctuation errors*, was the number of punctuation errors (see Conner & Lunsford, 1988; Lunsford & Lunsford, 2008; and Turabian, 2013) divided by the number of words in a participant's academic writing sample. A correlational design was justified for this study because other researchers on text messaging (or instant messaging) have used correlational analyses (De Jonge & Kemp, 2012; Drouin, 2011; Drouin & Davis, 2009; Drouin & Driver, 2014; Kemp & Bushnell, 2011; Plester, Lerkkanen, Linjama, Rasku-Puttonen, & Littleton, 2011; Plester, Wood, & Bell, 2008; Plester, Wood, &

Joshi, 2009; Rosen et al., 2010; Varnhagen et al., 2010; Wood, Jackson, Hart, Plester, & Wilde,

2011; Wood, Kemp, Waldron, & Hart, 2014). Though researchers have suggested that

longitudinal studies be conducted (Drouin, 2011; Drouin & Davis, 2009; Drouin & Driver, 2014;

Plester, 2009; Varnhagen, 2010; Wood et al., 2014), the researcher did not find enough evidence

in the literature to justify a longitudinal design to determine the relationship between text-

messaging habits and punctuating sentences. Rosen et al. (2010), noting that a weakness in his

study was the use of writing prompts, suggested more correlational studies, studies "to relate the

daily use of textisms to a variety of actual classroom writing assignments to better assess the

nature of their relationship" (p. 436). This present study adhered to such a focus and design.

Research Question

The research question for the study was the following:

RQ1: How accurately can frequency of punctuation errors in academic writing be

predicted from a linear combination of frequency of text messaging and frequency of textese for

college students?

Null Hypothesis

The hypothesis for the study was the following:

H₀1: There will be no significant predictive relationship between the criterion variable

(frequency of punctuation errors) and the linear combination of predictor variables (frequency of

text messaging and frequency of textese) for college students.

Participants and Setting

The participants were 115 college students from a four-year private college located in the

Southeast United States. To ensure sufficient power, at least 100 participants were needed

because, according to Stevens (2002), "power is *heavily* dependent on sample size" (p. 194,

emphasis in the original); and according to Warner (2008), "a minimum *N* of at least 100 cases is desirable for a multiple regression with two predictor variables" (p. 451). The participants were enrolled in one institution, which was chosen by convenience because it was one to which the researcher had ready access and to which he was familiar (see Gall et al., 2007). In addition to mere convenience, Gall et al. (2007) emphasized that it is important "that the sample suits the purposes of the study" (p. 175).

The participants aligned with the purpose of the study, which was to determine the relationship between text-messaging habits and punctuation errors in academic writing. Though the data for text-messaging habits could have been collected from participants across many research sites, the challenge for the researcher was how to collect academic writing samples for analysis. If the researcher were to collect samples from participants across many research sites, he would receive writing samples representing the peculiarities of many individual college classes (e.g., in the organization, length, and difficulty of assignment). Because of this, the researcher determined that the study would be stronger if all the participants were from the same school and from the same class. If students were from the same class, they would receive similar instruction and would be held to the same expectations for content, organization, style, and mechanics. If they were not in the same class, the findings regarding punctuation errors could be explained, not by the participants' text-messaging habits, but rather by the ease or the difficulty of a particular writing assignment. The participants were appropriate for the present study because, given that the participants were enrolled in the same class, it allowed the researcher to collect naturalistic data that was similar in style and content.

Unfortunately, it would be unlikely to get 100 participants from one class to participate in the study; therefore, the selected research site was ideal because all four-year students at this site

must receive credit for a sophomore literature course. Because of this, the researcher was able to invite a solid cross-section of four-year college students to the study. The site was also ideal because, regardless of semester, section, or teacher, the students in sophomore literature were required to compose a paper based on the same criteria and rubric.

Furthermore, the research site was ideal because, with an undergraduate enrollment of over 4,000, the college attracts students from across the United States and from many other countries. Because the site is a liberal arts college, participants were enrolled in various academic majors such as business, history, art, science, and engineering. Though the research site was convenient, both the site and the participants from this site were the best ones for this study because the participants had received similar instruction as it pertained to the writing sample, thus mitigating the threat that the results of the study were influenced by students receiving incoherent or contradicting instruction regarding the assignment to be collected.

All students enrolled in an on-campus sophomore literature class (with the exception of the researcher's sophomore literature students) were contacted by e-mail, the e-mail addresses being procured from the office of the academic vice-president (see Appendix A for e-mail invitation). The estimated number of students enrolled and contacted in the fall and spring semesters was 300 each semester. The e-mail was sent prior to the due date of the literary critique (a required paper in sophomore literature) with follow-up e-mails sent as needed. The researcher asked the sophomore literature teachers to announce the study to their students, and he also made announcements by visiting many sections of sophomore literature.

The participants comprised 25.2% male students and 74.8% female students. There were 14.8% freshmen, 53.9% sophomores, 19.1% juniors, and 12.2% seniors. The age ranged from 20-21 years old. As for ethnicity, there were 8.7% Asian/Asian-American, 4.3% Black/African-

American, 4.3 Hispanic/Spanish decent, 78.3 White/Caucasian, and 4.3 that chose the option

Other. Ninety-three percent claimed English as their first language. The academic major with

the most participants was education (27.8%), followed by business (13.9%). Other majors were

science (12.2%); nursing (9.6%); Bible and criminal justice (5.2%); computer science and office

administration (4.3%); art and English (3.5%); prelaw and writing (2.6%); history (1.7%); and

engineering, interdisciplinary studies, music, and speech (.9%).

Instrumentation

The researcher used three instruments for the study: a survey on the text-messaging

habits among college students, a content analysis for the frequency of textese in text messages,

and a content analysis of the punctuation errors in academic writing.

Survey on Text-Messaging Habits among College Students

The purpose of the cross-sectional survey (see Appendix B) was to provide critical

information about the text-messaging habits of the participants, namely, how many text messages

the participants send in a five-day period and the degree to which they use textese in text

messages. Using a survey to gather information was justified because a survey is an appropriate

instrument for a correlational study (Fraenkel & Wallen, 2000). More important, a survey was

justified because other studies on text messaging have used surveys (or questionnaires) to gather

information about participants' text- (or instant-) messaging habits or about their use of textese

(Coe & Oakhill, 2011; De Jonge & Kemp, 2012; Drouin, 2011; Drouin & Davis, 2009; Plester et

al., 2011; Plester et al., 2009; Rosen et al., 2010). Of the previously mentioned studies, only two

disclosed their surveys: Coe and Oakhill (2011) and Plester et al. (2011). The researcher

consulted these studies for their content, wording of questions, and format of questions. The

researcher's 13-question survey not only identified the text-messaging habits of the participants

but it also obtained information about the demographics of the participants, such as their age, sex, major, classification, and nationality. Because the researcher used a convenience sample, Fraenkel and Wallen (2000) recommended that "the researcher should be especially careful to include information on demographic and other characteristics of the sample that was actually studied" (p. 112). Though the purpose of the study was not to report correlations between demographic information and text-messaging habits, the demographic information was used to describe the sample being used for the study as a means to further discuss the results and to aid future researchers (see Fraenkel & Wallen, 2000). The researcher employed a panel of three experts, individuals who have conducted research on the topic of text messaging and literacy, to ensure that the survey was a valid instrument for obtaining accurate data from all the participants. According to Fraenkel and Wallen (2000), the content validity of an instrument can be achieved by "[having] someone look at the content and format of the instrument and judge whether or not it is appropriate" (p. 171). The following researchers provided feedback on the survey for the study: Michelle Drouin, Abbie Grace, and Larry Rosen. All three researchers have published studies on text messaging and literacy, studies that have helped to shape the present study. To further ensure validity for this instrument, the researcher conducted a pilot study where the pilot-study participants completed the survey at two different times and were allowed to provide feedback each time they took the survey (Creswell, 2008).

Content Analysis for Frequency of Textese in Text Messages

The purpose of the content analysis for textese frequency (see Appendix C) was to obtain a reliable number of textese occurrences within a text-messaging writing sample. To accomplish this, textese categories were established. According to Gall et al. (2007),

The essence of a content analysis is the coding of the document's messages into

categories. Each category should represent a discrete variable that is relevant to your

research objective. The categories should be mutually exclusive, such that any bit of

communication can be coded by only one category in the category system. (p. 289)

To measure participants' use of textese (or the grammatical errors that participants commit when

text messaging), researchers in previous studies obtained data by having their participants do one

of the following: respond to writing prompts (Coe & Oakhill, 2011; Drouin & Davis, 2009;

Plester, 2009; Plester et al., 2011), write spoken or prewritten sentences into textese or into a

form that reflects how participants would normally write when text messaging (De Jonge &

Kemp, 2012; Kemp & Bushnell, 2011; Plester, 2008), or provide copied transcriptions of text

messages sent by the participants (Plester et al., 2011; Wood et al., 2014). For the study, the

researcher followed Grace et al. (2014) by having the participants rewrite the five most recent

sent text messages on their cell phones (and more than five messages in case the combined

messages did not add up to 50 words). The average length of the text-messaging writing sample

was 68 words. As for the content analysis, Gall et al. (2007) recommended that the researcher

use "a coding system that has been used in previous research" (p. 289). Previous researchers

have classified or counted textese (or "grammatical errors," in the case of Wood et al., 2014, p.

285) that was used in writing samples (Coe & Oakhill, 2011; De Jonge & Kemp, 2012; Drouin &

Davis, 2009; Plester et al., 2009; Plester et al., 2011), and the researcher consulted the previous

studies and the guidance of Gall et al. (2007) for the creation of the content analysis. As for the

procedure of the actual content analysis, trained coders read the text-messaging writing samples,

tallied the occurrences of textese within each writing sample, and tallied the words of each

writing sample. After the coders established the total number of textese occurrences and the total

number of words, the researcher divided the number of textese occurrences by the number of

words that the participant used in his or her writing sample (Drouin & Driver, 2014; Grace et al.,

2014). A word was anything that could stand as a word if the message were read aloud (see

Drouin & Driver, 2014). For example, *im soooooo* ☺ was three words; *im happy* ☺ was counted

as only two.

Content Analysis of Punctuation Errors in Academic Writing

The purpose of the content analysis for punctuation errors (see Appendix D) was to

obtain a reliable number of punctuation errors within an academic writing sample. To

accomplish this, the researcher established categories of punctuation errors (see Gall et al.,

2007). As for the academic writing sample, the researcher collected an essay from participants'

sophomore literature teacher, the teacher's name being identified by the participant on the

survey. This writing sample, a literary critique, was an average of 796 words in length and

required students to summarize a literary work, evaluate it, and make a personal application.

This writing sample provided essential data for this correlational study, namely, the participants'

frequency of punctuation errors. In the literature, this type of instrumentation was not as

frequent as the textese instruments mentioned above. Shafie, Azida, and Osman (2010), for

example, collected "class assignments" and what the researchers referred to as "examination

scripts" to determine the use of textese by their participants (p. 29), but the researchers did not

provide descriptive statistics from these samples. Rosen et al. (2010) also used writing samples

and had the participants write the samples (a formal and an informal response to two separate

prompts) as part of the study. The samples were not written prior to the study nor were they

written for academic or for social purposes. Wardyga (2012), though he did not collect a writing

sample, made use of participants' writing scores on the SAT as well as the final grade in a

college class. Though the writing sample for the study was not prevalent in the literature, Rosen

et al. (2010) made a call for authentic writing samples to be used in future studies, remarking that

"additional work should be done to relate the daily use of textisms to a variety of actual

classroom writing assignments to better assess the nature of their relationship" (p. 436).

Following this call, this researcher used an authentic writing sample, an essay assigned for a

sophomore-level literature class, a class that is a requirement for all students pursuing a

bachelor's degree at the participating institution. Furthermore, Gall et al. (2007) made provision

for such instrumentation in their discussion of performance assessment, which they referred to as

"an approach to evaluating students by directly examining their performance on tasks that have

intrinsic value" (p. 215). This academic writing sample was justified because, in the spirit of

performance assessment, it allowed the researcher to analyze "complex, complete, real-life

tasks" (p. 215). The researcher used Lunsford and Lunsford's (2008) list of errors pertaining to

punctuation, cross-referencing them with Turabian's *Manual for Writers* (2013). The frequency

of punctuation errors was calculated similarly to the frequency of textese: the total number of

punctuation errors was divided by the total number of words in the literary essay. To do this, the

researcher used the word count feature on Microsoft Word. On the electronic copy, the

researcher deleted all elements of the paper that would inflate the word count (such as the title

and subheadings); the researcher then took the word count provided by Microsoft Word and

wrote that number on the survey before the coders analyzed the writing sample for punctuation

errors.

Validity and Reliability of Instruments

The researcher conducted a pilot study to determine the effectiveness of the research

instruments. This step allowed the researcher to receive feedback and make adjustments if

necessary about the clarity of the survey and to determine whether the content analysis

instruments gave him the data needed and whether the instruments needed revision. For the

content analysis, the researcher recruited six coders. The coders were college English teachers

and graduate students in English education at the participating institution; he provided them

information about the study and how to conduct the content analysis. Three coders evaluated the

textese writing samples; three evaluated the academic writing samples. This step was critical

because it allowed the researcher to see the shortcomings of the instruments. Between the time

of the pilot study and the analysis of the real data, the researcher revised the content analyses and

asked available English teachers, mostly those who participated in the pilot study, to practice

using the instrument with writing samples from the initial pilot study (or a writing sample that

the researcher created for the purpose). The goal in doing this was to determine how reliable the

instruments were, reliability at this point being judged at a glance.

For the actual study, the researcher established interrater reliability of the content analysis

instruments by using the percentage method and Cronbach's alpha. The researcher trained six

coders to use the content analyses: three coders to use the textese content analysis and three to

use the punctuation content analysis. All six coders were teachers of college-level English and

all had master's degrees in English education. According to Stemler (2001), "one of the most

critical steps in content analysis involves developing a set of explicit recording instructions"

("Reliability," para. 1). The researcher gave the coders a set of written instructions and gave

them an opportunity to practice using the instruments before analyzing actual data. Training

took place on Tuesday, May 16, and Wednesday, May 17. On these two days, the researcher

provided instruction (see Appendixes E and F) about how to identify errors and practice using

the instructions and instruments. On Thursday, May 18, each team of coders began evaluating

the same 10 samples (cases 1-10). On Thursday, May 18, coders evaluated the same three samples, compared their scores, and made adjustments. On Friday, May 19, coders evaluated the same seven samples. On Monday, May 22, the coders were able to see each other's scores and make further adjustments. During this process, the researcher served to clarify rules and to help coders categorize certain errors. The researcher also gave coders the freedom to ask each other questions and to come up with an answer together. These samples were used to later establish interrater reliability. Once the coders evaluated the same set of samples, the data were divided among the coders to complete this stage of data collection. As was true during the analysis of the first 10 samples, coders were allowed to ask the researcher questions and to clarify categories with each other. The researcher also clarified coding procedures as questions arose. (It was the researcher's plan to include additional samples to ensure interrater reliability; but because of time limitations, he was able to do this on a small scale only for the textese writing samples.)

Of the studies in the literature that performed a content analysis on text messages or writing errors, few reported interrater reliability. Drouin and Driver (2014) was the one study that did report interrater reliability, and they reported a high percentage of agreement between the two researchers. The percentage method, however, is criticized as an unreliable method of demonstrating interrater reliability. Hallgren (2012) viewed the percentage method as a mistake because it does "not correct for agreements that would be expected by chance and therefore overestimate the level of agreement" (p. 25). Tables 3 and 4 show low interrater reliability for both the punctuation coders and the textese coders for the study.

Table 3

Percentage of Punctuation Interrater Reliability based upon Absolute Agreement

Case	Coder 1	Coder 2	Coder 3	Agreement
1	6	6	10	33.33%
2	0	1	1	33.33%
3	4	3	5	0.00%
4	1	1	0	33.33%
5	3	3	4	33.33%
6	2	2	0	33.33%
7	1	0	1	33.33%
8	1	3	1	33.33%
9	2	6	4	0.00%
10	2	0	0	33.33%
Interrater Reliability				26.67%

Table 4

Percentage of Textese Interrater Reliability based upon Absolute Agreement

Case	Coder 1	Coder 2	Coder 3	Agreement
1	53	64	46	0.00%
2	5	4	4	33.33%
3	8	6	8	33.33%
4	7	7	6	33.33%
5	12	11	12	33.33%
6	15	12	13	0.00%
7	7	4	5	0.00%
8	9	10	10	33.33%
9	11	9	10	0.00%
10	22	16	22	33.33%
11	2	1	2	33.33%
55	14	15	14	33.33%
Interrater Reliability				22.22%

The percentage method is unforgiving for scores that do not absolutely agree. Because of this, it is possible to improve interrater reliability using the percentage method by allowing

agreement to be based on nearness instead of absolute agreement. Hallgren (2012) stated that "for ordinal, interval, or ratio data where close-but-not-perfect agreement may be acceptable, percentages of agreement are sometimes expressed as the percentage of ratings that are in agreement within a particular interval" (p. 25). For the study and for studies that seek to replicate it, it would be impossible to train a group of coders to attain absolute agreement on a phenomenon as nuanced as punctuation errors. If agreement were based upon coders disagreeing by one count (either one more or one less), the percentage of agreement improves to 60% for the punctuation coders and to 66.6% for the textese coders. If agreement were based upon coders disagreeing by two counts (either two more or two less), the percentage of agreement improves to 90% for the punctuation coders and to 77.7% for texese coders. According to Riffe, Lacy, and Fico (1998), "A minimum level of 80% is usually the standard" for the percentage method of establishing interrater reliability (p. 128).

In addition to showing the percentage of agreement, the researcher also calculated interrater reliability using Cronbach's alpha, a function found on SPSS. According to Stemler (2004), this consistency estimate works for data classified as ordinal, interval, and ratio; and Hallgren (2012) referred to this "intra-class correlation" as "one of the most commonly-used statistics for assessing IRR for ordinal, interval, and ratio variables" (p. 29). It is more appropriate for the study because it does not judge different scores between raters as harshly as the percentage method (Stemler, 2004). A drawback to this method of establishing interrater reliability is that Cronbach's alpha is more concerned that "each judge is consistent in classifying the phenomenon according to his or her own definition of the scale" (Stemler, 2004, "Consistency Estimates / General Description"). Hallgren (2012) explained that "ICCs incorporate the magnitude of the disagreement to compute IRR estimates, with larger-magnitude

disagreements resulting in lower ICCs than smaller-magnitude disagreements" (p. 29). Tables 5

and 6 illustrate the interrater reliability for the punctuation coders and the textese coders. It can

be seen that the Cronbach's alpha is good for the punctuation coders and excellent for textese

coders (Hallgren, 2012).

Table 5

Punctuation: Intraclass Correlation Coefficient

	Intraclass Correlation[b]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.734[a]	.419	.918	8.667	9	18	.000
Average Measures	.892[c]	.684	.971	8.667	9	18	.000

Table 6

Textese: Intraclass Correlation Coefficient

	Intraclass Correlation[b]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.956[a]	.891	.986	63.579	11	22	.000
Average Measures	.985[c]	.961	.995	63.579	11	22	.000

Procedures

After receiving approval from the Institutional Review Board (IRB) and conducting the

pilot study, the researcher recruited participants in the fall 2016 and spring 2017 semesters,

recruitment being done through e-mail invitations and in-class announcements. The e-mail

invitation was delivered by the participating institution on the researcher's behalf to the students enrolled in sophomore literature, and follow-up e-mails were also sent by the institution on the researcher's behalf (see Appendix A for e-mail). The e-mail invitation was a critical component in the study because it informed the participants of the nature of the study and provided a link to the survey found on Survey Monkey. Because participation was low in the fall semester, the researcher utilized an incentive in the spring, a $20 Starbucks gift card for every twentieth participant who completed the survey. To further increase awareness of the study, announcements were made in various sections of sophomore literature by the teacher or by the researcher.

On Survey Monkey, the participants completed the form of informed consent (Appendix G) and completed the survey (Appendix B). Because the study was predictive, the survey was made available before participants submitted their papers for their sophomore literature class; but to increase the number of participants, the link for the survey remained live until past the project deadline. The identification information that participants provided was their student identification number and their literature teacher's name. This information was integral to the study so that the researcher could (a) obtain an electronic copy of the participant's literary critique from the participant's teacher and (b) confirm with the participating institution that each participant was at least 18 years of age and that his or her cumulative GPA was at least 2.0. Participants were also asked to provide information about their sex, year of birth, nationality, and academic major. For those who wanted to be eligible for the gift card, they were asked to include their name and on-campus box number. Once the participants completed the survey, the researcher confirmed with the participating institution that the participants were at least 18 years of age and that they had at least a 2.0 cumulative GPA. Those who did not meet either of those

two criteria were removed. The researcher also e-mailed the participants' teachers to obtain an electronic copy of the participants' literary critique.

Having all the data for the study, the researcher printed the participants' surveys and literary critiques, ensuring that the surveys were matched to the participants' literary critiques by providing new numbers to the participants' data. The content analysis team were prevented from seeing the names and student identification numbers of the participants. The printed surveys, printed writing samples, and back up flash drive of the data remains in a locked filing cabinet in the researcher's home.

Data Analysis

Once the data were obtained, a multiple regression analysis was used to test the relationship of the variables. The strengths of the multiple regression analysis are that, first, it is "one of the most widely used statistical techniques in educational research," and second, "it provides estimates both of the magnitude and statistical significance of relationships between variables" (Gall et al., p. 353). Using a multiple regression analysis was justified because this statistical technique allows for "a correlation between a criterion variable and the best combination of *two or more* predictor variables" (Fraenkel & Wallen, 2000, p. 363, emphasis in the original). For this study, the frequency of text messaging and the frequency of textese was used to predict the criterion variable of punctuation errors. Using SPSS, assumption tests were conducted to identify bivariate outliers, multivariate normal distribution, and the absence of multicollinearity. SPSS was then used to conduct the multiple regression analysis with an alpha level of .05.

CHAPTER FOUR: FINDINGS

Overview

In Chapter 4, the researcher will discuss the descriptive statistics, the data screening procedures, and the assumptions for the multiple regression analysis.

Research Question

The research question for the study was the following:

RQ1: How accurately can frequency of punctuation errors in academic writing be predicted from a linear combination of frequency of text messaging and frequency of textese for college students?

Null Hypothesis

The hypothesis for the study was the following:

$H_0 1$: There will be no significant predictive relationship between the criterion variable (frequency of punctuation errors) and the linear combination of predictor variables (frequency of text messaging and frequency of textese) for college students.

Descriptive Statistics

The descriptive statistics for the predictor and criterion variables are found in Table 7. Text-messaging frequency was determined by averaging the five-day total of participants' sent text messages. Textese frequency was based on the total number of textese occurrences in the participants' writing sample being divided by the total number of words in that writing sample. Punctuation-error frequency was based on the total number of punctuation-error occurrences in the participants' writing sample being divided by the total number of words in that writing sample. The descriptive statistics for the raw numbers of textese occurrences and punctuation errors are found in Table 8.

Table 7

Descriptive Statistics for Predictor and Criterion Variables

Variables	*n*	*M*	*SD*
Text-messaging frequency	115	67.22	9.28
Textese frequency	115	.17	.01
Punctuation-error frequency	115	.0034	.0003

Table 8

Descriptive Statistics for Raw Numbers of Textese and Punctuation Errors

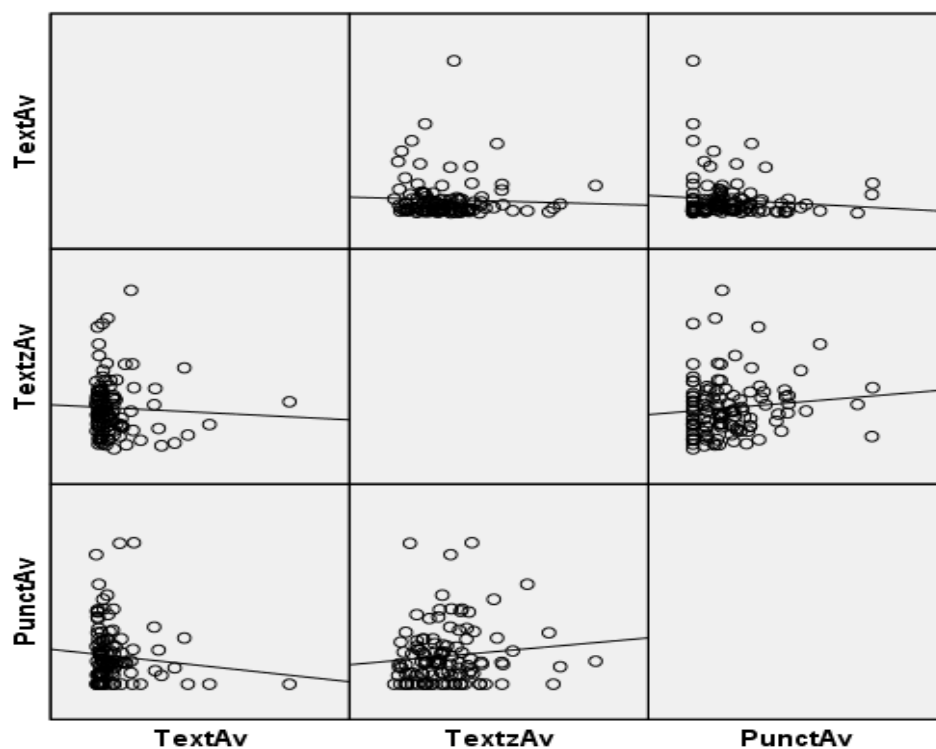| Variables	*n*	*M*	*SD*
Textese frequency	115	11.23	.73
Punctuation-error frequency	115	2.69	.26

Results

Data Screening

A multiple regression analysis was conducted to determine if there was a significant predictive relationship between the criterion variables (punctuation errors) and the linear combination of predictor variables (text-messaging frequency and the frequency of textese). The data was screened for completed surveys, matching academic writing samples, and for participants who met the age and GPA requirements. Of the 207 participants who accessed the survey, the data of 115 participants were used for the study.

Assumptions

Using SPSS, the data were analyzed for the assumptions of bivariate outliers, multivariate normal distribution, and the absence of multicollinearity. The scatterplot (Figure 1) demonstrates the presence of outliers; however, the researcher determined to retain all outliers

because the uniform removal of all outliers had no influence on the results. Multivariate normal

distribution was examined using scatter plots. The assumption was deemed tenable by the

researcher using a visual inspection. See Figure 1 below.

Figure 1. Correlation matrices for punctuation-error frequency, textese frequency, and test-messaging frequency.

The assumption of nonmulticollinearity was met because multicollinearity among the predictor

variables was low (text-messaging frequency, Tolerance = .998, VIF = 1.00; frequency of

textese, Tolerance = .988, VIF = 1.00).

Results for Null Hypothesis

A multiple regression analysis was conducted on the data of 115 participants to determine

whether there was a relationship between college students' text-messaging habits and their

ability to use punctuation in an academic writing sample. The predictor variables were text-

messaging frequency and textese frequency; the criterion variable was punctuation errors.

Tables 9 and 10 show the model summary and ANOVA for all participants.

Table 9

Model Summary of All Participants with Textese and Punctuation Errors as Percentages

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.143[a]	.021	.003	.003544

Table 10

ANOVA of All Participants with Textese and Punctuation Errors as Percentages

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.000	2	.000	1.172	.313[b]
	Residual	.001	112	.000		
	Total	.001	114			

a. Dependent Variable: PunctAv
b. Predictors: (Constant), TextAv, TextzAv

The linear combination of text-messaging habits were not significantly related to punctuation errors at the 95% confidence level where $F(2, 112) = 1.17$, $p = .31$. Thus, the researcher failed to reject the null. The multiple correlation coefficient was .14, representing a 2% variance in the criterion variable as a result of the predictor variables. The results showed that there was no relationship between how much college students text and their punctuation ability.

CHAPTER FIVE: CONCLUSIONS

Overview

The researcher sought to determine the relationship between the text-messaging habits of college students and their ability to use punctuation in academic writing. Using a survey, text-messaging writing sample, and academic writing sample, data were obtained to perform a multiple regression analysis that sought to determine the predictive relationship between the predictor variables of text-messaging frequency and textese frequency and the criterion variable of punctuation errors. In Chapter 5, the researcher added texture to the findings of the study by placing the findings in apposition to previous studies and by providing recommendations for future research.

Discussion

The purpose of the study was to determine the relationship between college students' text-messaging habits and their ability to use correct punctuation in Standard Written English. The participants were 115 college students from a four-year private institution in the Southeast United States. Although there was no definitive linear relationship between the text-messaging habits of college students and how those habits corresponded to their academic writing ability, the study itself was not in vain. The results of the study showed that there was no relationship between how much college students text and their punctuation ability, but the method of the study provides a solid model for future researchers to analyze the relationship of text-messaging habits and literacy using naturalistic data. Furthermore, the present study adds more data to the corpus of literature on text messaging and literacy, thus helping fellow researchers to identify trends in college students' writing habits.

The researcher found that there was no significant relationship between college students' text-messaging frequency and their ability to use punctuation. To identify college students' text-messaging frequency, the researcher asked participants to record the raw number of text messages that they sent in the previous five days. From this self-report, the researcher found that the participants sent a daily average of 67 text messages. This number is high compared to what other studies have reported. Wood, Kemp, Waldron, and Hart (2014) reported that adult participants sent a mean of 9.6 text messages per day while Grace et al. (2014) reported that Canadian college students sent an average of 39.8 text messages per day. The number in the present study is closer to the number reported by Drouin and Driver (2014). Though the Drouin and Driver study provided a monthly average of 1,788, dividing this monthly average by 30 shows that the participants in Drouin and Driver's study sent an average of 59.6 text messages a day. The text-messaging average of the present study suggests that text messaging is still an integral means of communication for college students, if not a growing means of communication.

In the present study, the text-messaging frequency of college students was not significantly related to their ability to use punctuation. This finding both agreed and disagreed with other studies on text-messaging habits and literacy. A number of studies found no statistically significant negative relationship between text-messaging frequency and literacy (Drouin, 2011; Drouin & Driver, 2014; Grace et al., 2014; Wood et al., 2014). Drouin (2011), instead of finding a negative relationship, found a statistically significant positive relationship between text-messaging frequency and the ability of participants to read and spell. Unlike the previously mentioned studies, Rosen, Chang, Erwin, Carrier, and Cheever (2010), De Jonge and Kemp (2012), and Wardyga (2012) all found statistically significant negative relationships

between text-messaging frequency and literacy. As for Rosen et al. (2010), they found a statistically significant negative relationship between text-messaging frequency and participants' (who had some college education) formal writing scores (r = -.18, p < .05). De Jonge and Kemp (2012) found statistically significant negative relationships between text-messaging frequency and spelling (r = -.32, p < .01) and reading (r = -.31, p < .01). As for Wardyga (2012), he found a statistically significant negative relationship between female participants' text-messaging volume and their SAT writing scores (r = -.33, p < .01). That is, Wardyga found that the more female college students send and receive text messages the lower their SAT writing scores.

The present study also contributes data to how much college students use textese in their text messages. The participants in the present study used textese in 17% of their text messages. This percentage is similar to that of Grace et al. (2014), who found in two separate studies that college students have between 16% to 19% textese in their text messages. The percentages of Grace et al. (2014) and the present study are lower than that of Drouin and Driver (2014), who recorded 28%. Data collection procedures may have caused the differences in percentages. The present study followed the procedure of Grace et al. (2014), a procedure that asked participants to provide a text-messaging writing sample of at least 50 words. Drouin and Driver (2014) did not follow this same procedure, thus their text-messaging writing samples were as small as 6 words and as large as 147 words. For the 115 participants in the present study, the average number of words in their text-messaging writing samples was 68.08. It does not seem that the method of classifying textese created major differences in the percentages. The present study, for example, created mutually exclusive categories and marked only the first occurrence of textese within a word. Drouin and Driver (2014) and Grace et al. (2014), on the other hand, did not mark only the first occurrence of textese. Rather, according to Grace et al. (2014), anything

that deviated "from the conventional word" was marked (p. 860). If the present study were to follow the coding method of Drouin and Driver and Grace et al., it is possible that the textese frequency of the participants would be much higher.

Previous studies have found that certain types of textese are more prevalent than other types. For example, De Jonge and Kemp (2012) found that omitted capital letters and omitted apostrophes were the most frequent types of textese; and Wood et al. (2014) agreed with that finding in reporting that punctuation and capitalization errors were the most frequent types of textese in their study. Similarly, Drouin and Driver (2014) found that the most frequent uses of textese were omitted capitalization, accent stylization, and omitted apostrophes. For the present study, punctuation was the most frequent type of textese, with a mean of 6.36. The second most frequent was capitalization, with a mean of 2.30. The least frequent was initialisms, with a mean of .17.

The present study adds to the body of literature regarding text messaging and literacy by emphasizing written literacy, namely the use of punctuation. No other study in the literature emphasized this aspect of literacy. The present study, however, found no significant results. Though Drouin and Davis (2009) found no significant results in their study of college students' text-messaging habits and literacy, there were other studies that have shown significant results. Specifically, these studies (see Table 17) found weak to moderate statistical significance between textese (whether reported or actual) and literacy (whether reading, spelling, orthography, or writing).

Table 11

Reported Correlation Coefficients for Textese and Literacy

Study	Correlation Coefficient	Textese Correlated to an Aspect of Literacy	Statistical Significance
Rosen et al. (2010)	-.10**	formal writing	p < .01
De Jonge & Kemp (2012)	-.25* -.27*	Reading spelling	p < .05 p < .05
Drouin & Driver (2014)	-.22** -.15*	Reading spelling	p < .01 p < .05
Wood et at. (2014)	-.433**	Orthography	p < .01

Future researchers replicating the present study should expect that, if statistical significance were to be found at all, weak to moderate statistical relationships would be found among the variables.

The present study used naturalistic data to test participants' ability to use punctuation instead of testing students' ability to read or spell. Another unique quality of the study is that the researcher sought to obtain interrater reliability between his coders. The landmark study of Conners and Lunsford (1988), for example, did not record interrater reliability. They explained their rationale as follows:

> The usual question of inter-rater reliability did not seem pressing to us, because what we were looking for seemed so essentially charged with social conditioning and personal predilection. Since we did not think that we could always "scientifically" determine what was real error and what was style or usage variation, our best idea was to rationalize the arbitrariness inherent in the project by spreading out the analytical decisions. (p. 401)

In like manner, the revisited study of Lunsford and Lunsford (2008) did not seek to achieve interrater reliability but rather allowed the coders to use their best judgment.

As in the original study, although the coders could consult with the researchers about how to classify something they saw in a paper, they were given much autonomy in deciding what constituted an error and how to categorize it. As a result, the judgment calls about specific items were distributed among the group. (p. 791)

Whereas Conners and Lunsford (1988) and Lunsford and Lunsford (2008) analyzed writing samples for 20 different errors, the present study analyzed papers for only 8. The reason for such a small number is that the study was concerned with punctuation errors only. Furthermore, to achieve interrater reliability, the researcher used fewer categories as opposed to many (see Riffe, Lacy, & Fico, 1998). It is likely that the error percentages for the study would have been much higher had the content analysis instrument not been so restrictive. For example, Lunsford and Lunsford (2008) had categories for "mechanical error with a quotation" and "unnecessary comma" (p. 795). Though adding these two categories would no doubt have provided a more accurate picture college students' ability to use punctuation, the downfall of adding these two categories would be reduced interrater reliability.

Unlike spelling, punctuation can be considered correct based on the intent of the writer. For example, the conjunctive adverb *therefore* could be correctly followed by a comma or left open depending on the emphasis of the sentence.

Example 1. Hemingway loved bullfighting; <u>therefore</u>, he wrote about it.

Example 2. Claudius was a villain; <u>therefore</u> no one wept when he died.

It is also possible for *therefore* to be used as a conjunctive adverb within one independent clause, as in the following sentence:

Example 3. Because Hamlet is unsure of the ghost's origin, he <u>therefore</u> devises a plan to determine Claudius's guilt.

Examples 1-3, as far as punctuation is concerned, are correct. It is challenging to train coders to

distinguish between punctuation instances that are clearly incorrect and those which are, based

upon the writer's emphasis and intent, acceptable.

Even with constructions such as nonrestrictive elements and introductory elements,

coders can judge the presence or absence of punctuation in different ways. The rule for

nonrestrictive elements, for example, is that if the information is supplementary, it should be set

off by a pair of commas. The rule is simple enough, but whether the rule is correctly applied can

be ambiguous.

Example 1. Hamlet's step-father, <u>Claudius</u>, took the crown of Denmark.

Example 2. Hamlet's step-father <u>Claudius</u> took the crown of Denmark.

For anyone who has read *Hamlet*, it obvious that Claudius is Hamlet's step-father (not to

mention that having more than one step-father would be odd); therefore, Example 1 is correct.

However, if the writer is new to the play or thinks that his audience does not know the plot of the

play, Example 2 is understandable and makes the sentence read better.

Introductory elements are even more challenging. The challenge occurs when the

introductory element is short and the application of the comma rule seems pedantic. Turabian

(2013) explained the rule this way: "A comma is not necessary after a short prepositional phrase

unless the sentence could be misread without one" (p. 297). For the sake of coding errors, the

nuance of this rule makes it difficult to establish interrater reliability. To avoid ambiguity and

reduced interrater reliability, the researcher instructed the coders to mark the omission of the

comma as an error, regardless of the length of the introductory element (Appendix D). Another

challenge with introductory elements is the challenge that single word transitions and

conjunctions bring, transitions such as *first*, *therefore*, and *but*. Like the previous scenarios, the

presence or absence of a comma could be equally correct. A most interesting sentence is one which combines a coordinating conjunction and an introductory element.

Example 1. If Hamlet is right, he will honor his father; but, if Hamlet is wrong, he will endanger his own soul.

Example 2. If Hamlet is right, he will honor his father; but if Hamlet is wrong, he will endanger his own soul.

Example 1 is technically correct: it sets off the introductory phrase that acts almost like a parenthetical element. The problem with Example 1, though, is that it is pedantic; it is almost hypercorrect. Example 2 eliminates the first comma for the sake of readability and therefore could be considered stylistically correct. (See *Chicago Manual of Style*, 2017, section 6.26).

As for hyphenated words, the content analysis for the study was conservative: the coders could mark hyphenation errors pertaining to a handful of prefixes such as *ex* and *self*. The rationale for this is found in Turabian (2013). Though Turabian gives detailed guidance on the correct use of hyphens for compound words and prefixes, the guidance covers pages 285-290. Given the timeframe that the researcher had to work with the coders, allowing coders to mark any type of hyphenation error would be too time consuming for them and would harm the interrater reliability. To illustrate the complications of hyphenation rules, the following four sentences are all hyphenated (or not) correctly but do not follow a seemingly logical pattern:

Example 1. The teacher is <u>well read</u> and thus grades too stringently.

Example 2. The teacher thinks that he is <u>all-knowing</u>.

Example 3. A <u>well-read</u> teacher graded my paper.

Example 4. The teacher thought I had a <u>thoroughly researched</u> paper.

Given the nuance of punctuation, the content analysis for the study was restrictive in what was considered an error and thus the percentage of errors per paper were low.

In both Conners and Lunsford (1988) and Lunsford and Lunsford (2008) studies, they identified the missing comma after the introductory element as the most frequent punctuation error. In Conners and Lunsford (1988), it accounted for 11.5% of total errors; in Lunsford and Lunsford (2008), it accounted for 9.6%. The missing comma after the introductory element was also the most frequent error in the present study, with it accounting for 25.4% of total errors. The rationale for such a high number is that there were fewer categories. Whereas the previous two studies had 20 categories, the present study had only 8.

Because the study identified insignificant results, the results of the study did not add support for the related ideas of self-regulation, memory, and transfer of learning—ideas that formed the theoretical framework for the present study. Regardless, the theoretical framework provided by the present study can be adopted and adapted by future researchers. Of the previously conducted studies on text messaging and literacy, few either acknowledged theory or situated their study in theory (Drouin, 2009; Drouin & Davis, 2011; Rosen et al., 2010). Using self-regulation, memory, and transfer as a theoretical lens can help explain the results, if any are found, in future studies that seek to show the relationship between text-messaging habits and academic writing skills such as punctuation. According to Bandura (1986), personal standards can influence one's self-regulation, and "people form standards for judging their own behavior partly on the basis of how significant persons in their lives have reacted to it" (p. 340). The researcher analyzed writing done in the regulated space of the classroom and the unregulated space of text messaging. With college students performing the writing task within these vastly different spaces, students can receive inconsistent feedback on their writing behavior, especially

when they deviate from Standard English. Said another way, students receive feedback from teachers in the regulated space of the classroom but write with little to no feedback in their text messages. The lack of consistent, constructive feedback can create an environment where students write according to two different standards, unconcerned with adhering to Standard Written English. When students fail to self-regulate their writing in unregulated spaces, they could potentially arrest their writing development and thus find themselves unable to apply the finer points of Standard English, namely punctuation. This can occur because writing is influenced by a person's memory (Bartholomae, 1980; Flower & Hayes, 1981; Hayes, 1996; Hayes & Chenoweth, 2006; Kellogg, 2006). Furthermore, when students seek to cross from the unregulated space of text messaging to the regulated space of academic prose, it is possible for negative transfer to take place, a type of learning transfer where "learning in one context impacts negatively on performance in another" (Perkins & Salomon, 1992, p. 4). It is true that participants in the present study demonstrated an ability to adapt their writing register between regulated and unregulated spaces, but replication or an adaption of the present study could show different results (see Limitations).

Implications

Before discussing the implications of the present study, the researcher must first discuss what the research does not mean. If the present study were to demonstrate a statistically significant relationship between textese frequency and punctuation errors, the results of the study could not declare that textese frequency causes punctuation error. To make such a conclusion would require experimental research by future researchers. It would also be incorrect to assert that those who use textese would be automatically unable to write Standard English.

Because the present study demonstrated no correlation, it can be concluded that college students can code-switch between the unregulated space of text messaging and the regulated space of academic prose. Though such a conclusion does not support the ideas related to self-regulation, memory, and transfer, this conclusion does agree with Lunsford and Lunsford (2008), who attributed the minimal presence of "IM [instant messaging] terms" in their 877 writing samples to the fact that students "wrote with a sense of what is appropriate for formal college writing" (p. 799). Viewing the results of the present study through the lens of code-switching, it can be asserted that if code-switching has the power to prevent textese in academic writing, it has the power to prevent punctuation errors as well.

Turner (2009) has promoted the use of code-switching from textese to Standard English and vice-versa in order to teach students "language awareness" (p. 63). The researcher of the present study was dubious of Turner's technique because textese de-emphasizes punctuation. Although students may learn from this technique not to write *LOL* in an academic paper, students' required exposure to textese could undermine their properly applying correct punctuation. The results of this researcher's present study, however, showed that such a concern is unfounded and that college students can misuse punctuation in an unregulated context but switch to using correct punctuation in a regulated context. Given this, teachers should harness the power of students' intuitive sense to code-switch in order to teach them the finer points of Standard Written English, namely, punctuation and capitalization. Beason (2001) recommended that "teachers send a prudent message about error gravity" (p. 58). Relying on common sense, a well-meaning teacher may attempt to follow Beason's advice by instructing students write correctly *all the time*, whether in the unregulated space of text messaging or in the regulated

space of academic writing. Though writing correctly all the time is not bad advice, the results of the present study do not support that technique.

Limitations

The first limitation to the study is the sample. The researcher recruited participants from various sections of two sophomore literature classes from a private college in the Southeast United States. The classes composed of about 300 students per semester. Accordingly, the researcher had to collect data over the course of two semesters to get more than 100 participants. Had the researcher obtained his sample from students enrolled in a freshman-level course, it is possible that there would be more participants, though the natural drawback is that the study would analyze samples from mostly freshman students. The rationale for recruiting from the sections of sophomore literature is that all instructors of these sections follow the same curriculum and paper requirements, thus giving the researcher similar writing samples to analyze. Furthermore, all four-year students at the participating institution are required to take sophomore literature, thus potentially giving the researcher a good balance of academic classifications and majors. Though recruiting from various sections of sophomore literature was helpful for the study, other researchers may find it difficult to obtain a similar sample. Though the researcher was able to obtain a sample that represented different academic classifications and majors, there was still an imbalance among the participants regarding race/nationality, academic classification, and sex.

The second limitation is the self-report measures. Because the participants knew the nature of the study via the e-mail invitation, class announcement, and consent form, it is possible that some participants inflated the number of text messages sent or the frequency of textese in their transcribed text messages. In analyzing the data, there may be one or two instances of

inflated numbers for sent text messages, but there appears to be no purposeful inflation in the transcribed text messages or punctuation errors. For future researchers, however, this may be a more significant problem.

The third limitation was achieving interrater reliability. For this study, the researcher reported interrater reliability according to the percentage method and according to Cronbach's alpha. Though the Cronbach's alpha demonstrated reasonable interrater reliability scores, the scores were not perfect. To replicate this study, the future researcher may want to have someone who has expertise in analyzing text for deviations from Standard English. The drawback from having such a requirement is that it could limit the number of studies that would choose to replicate this one. Furthermore, though it is important that coders demonstrate interrater reliability (Gall et al., 2007), this practice could restrict studies from reporting on the true state of naturalistic data. For this study, the researcher needed to be conservative in how punctuation errors were recorded. In other words, there were punctuation errors that, by virtue of the instrument, were not recorded and thus presented an inaccurate picture of the naturalistic data. Therefore, when the low raw number of punctuation errors were divided by the total number of words in the academic writing sample, the percentage of punctuation errors was quite low and thus contributed to the conclusion that there is no relationship between text-messaging habits and punctuation errors. However, when textese frequency and punctuation-error frequency are analyzed with the frequencies as raw numbers, the correlation achieves a weak statistical significance at $r = .204$ ($p < .05$).

Recommendations

The researcher recommends that, first, others replicate this study. Similar studies are needed to determine if significant results will occur when the participants are more in number

and when the participants are more representative in race and gender. For this study, Whites/Caucasians (78.3%), sophomores (53.9%), and females (74.8%) composed the majority of the 115 participants. Though the study was not intended to measure differences between groups of students, it would be helpful to see how much a more even balance between race/nationality, academic classification, and sex change the results of the study. It is also important that this study be replicated to determine if significant results will occur when the variables are analyzed as percentages and raw numbers.

A second recommendation is that replication of the study take place with one expert analyzing all writing samples. A threat to the legitimacy of studies such as the present one is achieving interrater reliability. For studies such as the present one to accurately analyze the data, an expert in punctuation is needed. In the present study, the researcher played the role of the expert; but his expertise was used to train the coders how to use the coding instrument. It would have been more efficient and fair to the research question for the researcher to code all the samples. Doing so would have been in agreement with other studies published on text-messaging habits and literacy (De Jonge & Kemp, 2012; Drouin & Davis, 2009; Grace et al., 2014), though not reporting on reliability would have fallen short of best practices for content analyses (Gall, Gall, & Borg, 2007). Conducting such a study with one expert coder would provide greater insight into how much textese frequency is associated with punctuation errors.

A third recommendation is for quasi-experimental research to be done on the efficacy of code-switching as tool to teach correct punctuation and capitalization. Technical mistakes in academic writing are ubiquitous, but the power of code-switching appears to be strong. Researchers would do well to explore how well code-switching exercises can teach the more technical elements of Standard Written English.

Summary

More research needs to be conducted as it relates to the role technology has on students' literacy. The present study focused on one domain of technology: text messaging. The researcher sought specifically to answer whether text-messaging habits relate to students' use of punctuation in academic writing. Though the results of this study did not produce significant or conclusive results, both the framework of the study and the limitations of the study indicate that more research must be done.

REFERENCES

Algeo, J. (2010). *The origins and development of the English language* (6th ed.). Boston,

MA: Wadsworth / Cengage Learning.

Allen, R. E., & McArthur, T. (1992). Punctuation. In T. McArthur (Ed.), *The Oxford companion*

to the English language (pp. 824-826). New York, NY: Oxford University Press.

Bailey, R. W. (1992). Literacy. In T. McArthur (Ed.), *The Oxford companion to the English*

language (pp. 613-615). New York, NY: Oxford University Press.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Upper

Saddle, NJ: Prentice Hall.

Bartholomae, D. (1980). The study of error. *College Composition and Communication, 31*(3),

253-269. Retrieved from http://www.jstor.org/stable/356486

Beason, L. (2001). Ethos and error: How business people react to errors. *College*

Composition and Communication, 53(1), 33-64. Retrieved from http://www.ncte.org/

library/NCTEFiles/Resources/Journals/CCC/0531-sept01/CO0531Ethos.pdf

Chicago Manual of Style. (2017). 17th ed. Chicago, IL: The University of Chicago Press.

Coe, J. E. L., & Oakhill, J. V. (2011). "TxtN is ez f u no h2 rd": The relation between

reading ability and text-messaging behaviour. *Journal of Computer Assisted*

Learning, 27, 4-17. doi: 10.1111/j.1365-2729.2010.00404.x

Common Core State Standards Initiative. (2010). *Common Core State Standards for English*

language arts and literacy in history/social studies, science, and technical subjects.

www.corestandards.org/wp-content/uploads/ELA_Standards.pdf

Conners, R., & Lunsford, A. (1988). Frequency of formal errors in current college

    writing, or Ma and Pa Kettle do research. *College Composition and*

    Communication, 39(4), 395-409. Retrieved from

    http://www.ncte.org/library/NCTEFiles/Resources/Journals/CCC/1988/0394

    -dec1988/CCC0394Frequency.pdf

Creswell, J. W. (2005). *Educational research: Planning, conducting, and evaluating quantitative*

    and qualitative research. (2nd ed). Upper Saddle River: NJ: Pearson.

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative*

    and qualitative research. (3rd ed.). Upper Saddle River: NJ: Pearson.

Crotteau, M. (2007). Honoring dialect and culture: Pathways to student success on high-stakes

    writing assessments. *English Journal, 96*(4), 27-32. Retrieved from

    http://www.ncte.org/library/NCTEFiles/Resources/Journals/EJ/0964

    -march07/EJ0964Honoring.pdf

Crystal, D. (1992). Register. In T. McArthur (Ed.), *The Oxford companion to the English*

    language (p. 859). New York, NY: Oxford University Press.

Crystal, D. (2008). *Txting: The gr8 db8*. Oxford, England: Oxford University Press.

Dawkins, J. (1995). Teaching punctuation as a rhetorical tool. *College Composition and*

    Communication, 46(4), 533-548. Retrieved from http://www.jstor.org/stable/358327

De Jonge, S., & Kemp, N. (2012). Text-message abbreviations and language skills in high school

    and university students. *Journal of Research in Reading, 35*(1), 49-68.

    doi: 10.1111/j.1467-9817.2010.01466.x

Drouin, M. A. (2011). College students' text messaging, use of textese and literacy skills. *Journal of Computer Assisted Learning, 27*, 67-75. doi: 10.1111/j.1365 -2729.2010.00399.x

Drouin, M., & Davis, C. (2009). R u txting? Is the use of text speak hurting your literacy? *Journal of Literacy Research, 41*, 46-67. doi: 10.1080/10862960802695131

Drouin, M., & Driver, B. (2014). Texting, textese and literacy abilities: A naturalistic study. *Journal of Research in Reading, 37*(3), 250-267. doi: 10.1111/j.1467-9817.2012.01532.x

Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review, 100*(3), 363-406. http://dx.doi.org.ezproxy.liberty.edu/10.1037/0033-295X.100.3.363

Fallahi, C. R., Wood, R. M., Austed, C. S., & Fallahi, H. (2006). A program for improving undergraduate psychology students' basic writing skills. *Teaching of Psychology, 33*(3), 171-175. doi: 10.1207/s15328023top3303_3

Fernandes, A. S. C. (2012). Writing to learn writing skills: A case study. *European Journal of Engineering Education, 37*(2), 179-192. doi: 10.1080/03043797.2012.672964

Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication,* 32(4), 365-387. Retrieved from http://www.jstor.org/stable/356600

Fraenkel, J. R., & Waller, N. E. (2000). *How to design and evaluate research in education*. (4th ed.). Boston, MA: McGraw Hill.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). Boston, MA: Pearson.

Garner, B. (2009a). Punctuation. In *Garner's modern American usage* (3rd ed., pp. 674-682). New York, NY: Oxford University Press.

Garner, B. (2009b). Standard English. In *Garner's modern American usage* (3rd ed.,

    pp. 771-772). New York, NY: Oxford University Press.

Grace, A., Kemp, N., Martin, F. H., & Parrila, R. (2014). Undergraduates' text messaging

    language and literacy skills. *Reading and Writing, 27*(5), 855-873.

    doi: 10.1007/s11145-013-9471-2

Greenbaum, S. 1996. *The Oxford English grammar*. New York, NY: Oxford University Press.

Green, S. B., & Salkind, N. J. (2011). *Using SPSS for Windows and Macintosh: Analyzing and*

    understanding data. 6th ed. Boston, MA: Prentice Hall.

Hallgren, K. A. (2012). Computing inter-rater reliability for observational data: An overview and

    tutorial. *Tutorials in Quantitative Methods for Psychology, 8*(1), 23-34. Retrieved from

    https://doaj.org/article/287241ad69104b63b4d2341173087f50

Hayes, J. R. (1996). A new framework for understanding cognition and affect in writing. In

    Levy, C. M. & Ransdell, S. (Eds.), *The science of writing: Theories, methods, individual*

    differences, and applications (pp. 1-27). Mahwah, NJ: Lawrence Erlbaum Associates,

    Inc., Publishers. Retrieved from https://liberty.illiad.oclc.org

Hayes, J. R., & Chenoweth, N. A. (2006). Is working memory involved in the transcribing and

    editing of texts. *Written Communication, 23*(2), 135-149.

    doi: 10.1177/0741088306286283

Hooper, R. I., & Butler, S. (2008). Student transfer of general education English skills to a social

    work diversity course: Is it happening? *Journal of the Idaho Academy of Science, 44*(2),

    1-10. Retrieved from http://iase.website/ias-publications/

Howell, D. C. (2011). *Fundamental statistics for the behavioral sciences*. 7th ed. Belmont, CA:

    Wadsworth, Cengage Learning.

Jones, C. G. (2011). Written and computer-mediated accounting communication skills: An

   employer perspective. *Business Communication Quarterly, 74*(3), 247-271.

   doi: 10.1177/1080569911413808

Kellogg, R. (2006). Professional writing expertise. In Cambridge handbook of expertise and

   expert performance. Cambridge, United Kingdom: Cambridge University Press.

   Retrieved from http://www.liberty.edu:2048/login? url=http://literati.credoreference.com/

   content/entry/cupexpert/professional_writing_expertise/0

Kemp, N., & Bushnell, C. (2011). Children's text messaging: Abbreviations, input

   methods and links with literacy. *Journal of Computer Assisted Learning, 27*,

   18-27. doi: 10.1111/j.1365-2729.2010.00400.x

Kenkel, J., & Yates, R. (2009). The interlanguage grammar of information management in L1

   and L2 developing writing. *Written Communication, 26*(4), 392-416.

   doi: 10.1177/0741088309341258

Kokaliari, E. D., Brainerd, M., & Roy, A. (2012). A longitudinal study of assessing APA writing

   competence at a BSW program. *Journal of Teaching in Social Work, 32*, 566-577.

   doi: 10.1080/08841233.2012.725706

Lunsford, A., & Lunsford, K. (2008). "Mistakes are a fact of life": A national

   comparative study. *College Composition and Communication, 59*(4), 781-806. Retrieved

   from http://www.jstor.org/stable/20457033

Mann, N. (2003). Point counterpoint: Teaching punctuation as information management. *College

   Composition and Communication, 54*(3), 359-393. Retrieved from

   http://www.jstor.org/stable/3594170

Martinez, R. A. (2010). *Spanglish* as literacy tool: Toward an understanding of the potential role of Spanish-English code-switching in the development of authentic literacy. *Research in the Teaching of English, 45*(2), 124-149. Retrieved from http://www.ncte.org/library/ NCTEFiles/Resources/Journals/RTE/0452-nov2010/RTE0452Spanglish.pdf

MLA handbook for writers of research papers. (2009). 7th ed. New York, NY: The Modern Language Association of America.

Murray, D. M. (2004). *The craft of revision*. 5th ed. Boston, MA: Thomson / Wadsworth.

Perkins, D. N., and Salomon, G. (1992). Transfer of learning. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.24.369&rep=rep1&type=pdf

Plester, B., Lerkkanen, M.-K., Linjama, L.J., Rasku-Puttonen, H., & Littleton, K. (2011). Finnish and UK English pre-teen children's text message language and its relationship with their literacy skills. *Journal of Computer Assisted Learning, 27*, 37-48. doi: 10.1111/j.1365-2729.2010.00402.x

Plester, B., Wood, C., & Bell, V. (2008). Txt msg n school literacy: Does texting and knowledge of text abbreviations adversely affect children's literacy attainment. *Literacy, 42*(3), 137-144. doi: 10.1111/j.1741-4369.2008.00489.x

Plester, B., Wood, C., & Joshi, P. (2009). Exploring the relationship between children's knowledge of text message abbreviations and school literacy outcomes. *British Journal of Developmental Psychology, 27*, 145-161. doi: 10.1348/026151008x320507

Powell, D., & Dixon, M. (2011). Does SMS text messaging help or harm adults' knowledge of standard spelling? *Journal of Computer Assisted Learning, 27*, 58-66. doi: 10.1111/j.1365-2729.2010.00403.x

Publication manual of the American Psychological Association. (2010). 6th ed.

  Washington, DC: American Psychological Association.

Quible, Z. K. (2008). The strategies approach: Effective for reviewing grammar and punctuation

  concepts. *The Delta Pi Epsilon Journal, 50*(3), 180-191. Retrieved from

  http://web.a.ebscohost.com.ezproxy.liberty.edu

Riffe, D., Lacy, S., & Fico, F. G. (1998). *Analyzing media messages using quantitative content*

  analysis in research. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Roberts, P. (1964). *English syntax: A programed introduction to transformational grammar*

  (Alternate ed.). New York, NY: Harcourt, Brace & World, Inc.

Romaine, S., & Kachru, B. B. (1992). Code-mixing and code-switching. In T. McArthur

  (Ed.), *The Oxford companion to the English language* (pp. 228-229). New York, NY:

  Oxford University Press.

Rosen, L. D., Chang, J., Erwin, L., Carrier, L. M., & Cheever, N. A. (2010). The

  relationship between "textisms" and formal and informal writing among young

  adults. *Communication Research, 37*(3), 420-440. doi: 10.1177/0093650210362465

Salomon, G., & Perkins, D. N. (1989). Rocky roads to transfer: Rethinking mechanisms of a

  neglected phenomenon. *Educational Psychologist, 24*(2), 113-142. Retrieved from

  http://www.tandfonline.com.ezproxy.liberty.edu/

Schou, K. (2007). The syntactic status of English punctuation. *English Studies, 88*(2), 195-216.

  doi: 10.1080/00138380601042790

Shafie, L. A., Azida, N., & Osman, N. (2010). SMS language and college writing: The

  languages of the college texters. *International Journal of Emerging Technologies*

  in Learning, 5(1), 26-31. doi: 10.3991/ijet.v5il.1010

Shaw, D. M., Carlson, C., & Waxman, M. (2007). An exploratory investigation into the relationship between text messaging and spelling. *The NERA Journal, 43*(1), 57-62. Retrieved from http://ezproxy.liberty.edu/login?url=https://search-proquest-com.ezproxy .liberty.edu/docview/206028569?accountid=12085

Skierkowski, D., & Wood, R. M. (2012). To text or not to text? The importance of text messaging among college-aged youth. *Computers in Human Behavior, 28*, 744-756. doi: 10.1016/j.chb.2011.11.023

Sloan, G. (1990). Frequency of errors in essays by college freshman and by professional writers. *College Composition and Communication, 41*(3), 299-308. Retrieved from http://www.ncte.org/library/NCTEFiles/Resources/Journals/CCC/1990/0413-oct1990/ CCC0413Frequency.pdf

Smith, A. (2011). Americans and text messaging. Pew Internet & American Life Project, September 19, http://pewinternet.org/~/media//Files/Reports/2011/ Americans%20and%20Text%20Messaging.pdf

Stemler, S. (2001). An overview of content analysis. *Practical Assessment, Research Evaluation, 7*(17). Retrieved from http://www.pareonline.net/getvn.asp?v=7&n=17

Stemler, S. (2004). A comparison of consensus, consistency, and measurement approaches to estimating interrater reliability. *Practical Assessment, Research & Evaluation*, *9*(4). Retrieved from http://PAREonline.net/getvn.asp?v=9&n=4

Stevens, J. (2002). Applied multivariate statistics for the social sciences. (4th ed.). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers. Retrieved from http://web.b.ebscohost.com .ezproxy.liberty.edu:2048/ehost/ebookviewer/ebook/bmxlYmtfXzYzNDc3X19BTg2?sid =9ee547f5-f010-45b9-b755-c4385d913016@sessionmgr112&vid=0&format=EB&rid=1

Tayebinik, M. & Puteh, M. (2012). Txt msg n English language literacy. *Procedia: Social and Behavioral Sciences, 66*, 97-105. doi: 10.1016/j.sbspro.2012.11.251

Taylor, P. (2014). *The next America: Boomers, Millennials, and the looming generational showdown*. New York, NY: PublicAffairs [Kindle edition].

Thurlow, C., & Brown, A. (2003). Generation txt? The sociolinguistics of young people's text-messaging. *Discourse Analysis Online, 1*(1). Retrieved from http://extra.shu.ac.uk/daol/ articles/v1/n1/a3/thurlow2002003-paper.html

Thurlow, C. (2006). From statistical panic to moral panic: The metadiscursive construction and popular exaggeration of new media language in the print media. *Journal of Computer Mediated Communication, 11*, 667-701. doi: 10.1111/j.1083-6101.2006.00031.x

Turabian, K. L. (2013). *A manual for writers of research papers, theses, and dissertations*: *Chicago style for students and researchers*. (8th ed.). Chicago, IL: University of Chicago Press.

Turner, K. H. (2009). Flipping the switch: Code-switching from text speak to standard English. *English Journal, 98*(5), 60-65.

Varnhagen, C. K., McFall, G. P., Pugh, N., Routledge, L., Sumida-MacDonald, H., & Kwong, T. E. (2010). Lol: New language and spelling in instant messaging. *Reading & Writing, 23*, 719-733. doi: 10.1007/s11145-009-9181-y

Wardyga, B. (2012). *The relationship between text message volume and formal writing performance among upper level high school students and college freshman* (Doctoral dissertation). Retrieved from http://digitalcommons.liberty.edu/doctoral/

Warner, R. M. (2008). *Applied Statistics: From Bivariate through Multivariate Techniques*. Los Angeles, CA: Sage Publications, Inc.

Weaver, C. (1979). *Grammar for teachers: Perspectives and definitions*. Urbana, IL: National Council of Teachers of English.

White, J. W. (2011). De-centering English: Highlighting the dynamic nature of the English language to promote the teaching of code-switching. *English Journal, 100*(4), 44-49. Retrieved from http://www.jstor.org/stable/23047777

Wood, C., Jackson, E., Hart, L., Plester, B., & Wilde, L. (2011). The effect of text messaging on 9- and 10-year-old children's reading, spelling and phonological processing skills. *Journal of Computer Assisted Learning, 27*, 28-36. doi: 10.1111/j.1365-2729.2010.00398.x

Wood, C., Kemp, N., Waldron, S., & Hart, L. (2014). Grammatical understanding, literacy and text messaging in school children and undergraduate students: A concurrent analysis. *Computers & Education, 70*, 281-290. doi: 10.1016/j.compedu.2013.09.003

Woolcock, N. (2014, March 24). Twitter and text are not GR8 for English skills, warns head. *The Times* (United Kingdom). Accession number 7EH83781774

APPENDIX A

E-MAIL INVITATION

College Student,

My name is Rob Achuff, and I'm conducting a study through Liberty University. My study seeks to determine the relationship between college students' text messaging habits and their ability to use punctuation. But in order for me to do this, I need your help! Would you consider being a participant?

If you choose to participate, you will complete a survey found on Survey Monkey. To access this survey, go to this link:

[include link here]

Filling out the survey will take no longer than 30 minutes. And once you're done, you're done!

The information from the survey will be used for the following purposes:

1. Your student ID will be used to obtain a copy of your sophomore literature paper (from your teacher via e-mail). This information will also allow me to get confirmation from Pensacola Christian College that you have a minimum cumulative GPA of 2.0 and that you are at least 18.
2. Your text messaging information will be used to determine how text messaging habits relate to academic writing ability.
3. If you would like to be eligible for a $20 Starbucks gift card, provide your name and on-campus box number at the end of the survey. Every twentieth participant who completes the survey and meets other requirements will be sent a gift card in their on-campus mailbox.

I'm excited to be conducting this study and, if you're willing, would like to have you participate!

Sincerely,

Robert R. Achuff

APPENDIX B

SURVEY ON TEXT-MESSAGING HABITS AMONG COLLEGE STUDENTS

Personal Information:

1. What is your student identification number?

2. What is the name of your sophomore literature teacher?

3. What is your academic classification?

4. In what year were you born? (enter 4-digit birth year; for example, 1976)

5. What is your gender?

6. What is your major?

7. What is your ethnic background?
    - Asian/Asian-American
    - Black/African-American
    - Hispanic/Spanish decent
    - White/Caucasian
    - Other (please specify)

8. Is English your first language?

9. How often do you send text messages?
    - Never
    - Once a month
    - Several times a month
    - Once a week
    - Several times a week
    - Once a day
    - Several times a day
    - Once an hour
    - Several times an hour
    - All the time
    - Other (please specify)

10. How often do you receive text messages?
     - Never
     - Once a month
     - Several times a month
     - Once a week
     - Several times a week
     - Once a day
     - Several times a day
     - Once an hour
     - Several times an hour
     - All the time
     - Other (please specify)

11. How many years have you been text messaging?

12. From your cell phone, count the number of text messages that you sent in the last five days. (Note: count only those messages where you wrote something; begin counting with the text messages that you sent yesterday and then count back an additional four days.)

13. From your cell phone, transcribe the 5 most recent text messages that you have sent. Transcribe each message <u>exactly</u> as you wrote them; however, omit any personal information, such as the names of people. (To do so, use brackets around personal information, like this: "I just saw [ ].") Skip any text message that you deem to be too personal or too sensitive.

     After you transcribe your 5 text messages, see if the total word count below is at least 50 words. If not, transcribe more messages so that you have at least 50 total words.

     If you would like to be eligible for a $20 Starbucks gift card, please provide your name and on-campus box number below.

APPENDIX C

CONTENT ANALYSIS FOR TEXTESE IN TEXT MESSAGES

Participant # _____   **Research Assistant** _____   **Date** ____

	Textese: The Big Five	Tally Marks	Total Number
1.	**Spelling:** misspelling, omission of letters, symbol for word, slang, or typo of a standard word (including a correctly spelled wrong word) • *whatcha* • *haha* (or *hehe*) for *ha-ha* (or *he-he*) • *g8* • *I'm so :)*		
2.	**Capitalization:** capitalization error (no capitalization; all capital letters) • **i**'m home now • I'M HOME NOW (three errors: one error per word) • #**i**love**america** (two errors: *i* and *america*) • *lol* instead of *LOL*; *ok* or *Ok* for *OK* (can also be spelled *okay*)		
3.	**Punctuation:** misuse of punctuation • missing periods after any expression • missing, misplaced, or misused apostrophe • hashtags before words • multiple punctuation marks (*!!!!!!* or *!?*)		
4.	**Spacing:** missing spaces between words (e.g., hashtags) • #**we**love**coffee** (two spacing errors)		
5.	**Initialism:** standard and nonstandard initialisms for expressions • *FYI* • *TMI* • *LOL*		
	Total Number of Textese		
	Total Number of Words in Text Messages		

APPENDIX D

CONTENT ANALYSIS FOR PUNCTUATION ERRORS IN ACADEMIC WRITING

Participant # _____   **Research Assistant** _____   **Date** ____

	Punctuation: The Big Eight	Tally Marks	Total Number
1.	**Introductory phrase/clause:** Missing or misused **punctuation** after phrase or clause, regardless of length. • *At first I was confused.* • *At the beginning of the novel; Hardy describes the heath.*		
2.	**Compound sentence:** Missing **comma**/**semicolon** when clauses, regardless of length, are joined by coordinating conjunction (including the word *so*). • *Macbeth was wrong and Lady Macbeth was wrong.*		
3.	**Nonrestrictive element:** Missing **comma** (or **dash** or **parenthesis**) when a pair is required. • *Duncan, the king of Scotland was murdered by Macbeth.*		
4.	**Compounds:** added punctuation to compound subjects and compound verbs. • *William Shakespeare, and Christopher Marlowe were playwrights.* • *Shakespeare was born in Stratford-on-Avon, but later worked in London.*		
5.	**Apostrophe:** missing, misused, or added **apostrophe** for a possessive word, contraction, or lowercased plural letter. [See Turabian 20.1-20.2.]		
6.	**Run-on (fused):** missing **period**, **semicolon**, **colon**, or **dash** between compound sentence that does not use a coordinating conjunction. • *He likes coffee she likes tea.* **Run-on (splice):** mistaken **comma** for period or semicolon between compound sentence. • *He likes coffee, however, she likes tea.*		
7.	**Fragment:** mistaken **period** or **semicolon** for comma, creating a sentence fragment.		
8.	**Hyphens:** missing hyphens for words with the prefixes -*ex* and -*self*; missing hyphens for prefixes joined to proper nouns. • pro**S**hakespearean instead of pro-Shakespearean		
	Total number of errors		
	Total number of words		

APPENDIX E

TRAINING PROCEDURES: TEXTESE CONTENT ANALYSIS

Your job is to identify five types of textese (hereafter called the *Big Five*) in a writing sample of text messages. To do this efficiently and accurately, follow this procedure:

1. Become familiar with the Big Five so that you will know what to mark and what to ignore.

2. Ensure that the Participant Number on the content analysis matches the Participant Number on the writing sample of textese. If it does not, contact the researcher immediately.

3. As you read the writing sample of text messages, place brackets around each occurrence of the Big Five.

4. Match each occurrence of the Big Five in the writing sample to the appropriate category in the content analysis. Place a tally mark in the appropriate cell for each occurrence of textese.

5. Once you are done analyzing the writing sample, provide a total of textese for each category and for the entire writing sample.

6. Know that *textese* represents deviations from Standard English. So to ensure that you and the other coders accurately and consistency mark textese, follow these principles for performing the content analysis.

    A. Mark only the **first occurrence of textese** in a word.

    B. Expect all text messages to have a capitalized first letter and a period at the end of **each expression** or **sentence**. A message that lacks these items has two deviations (capitalization and punctuation).

    C. Ignore any deviation that does not clearly agree with the Big Five, including awkward, incorrect, and informal syntax.

7. When you are done with tallying the occurrences of textese, count the number of words in the writing sample; and provide the total number of words at the bottom of the content analysis. A word will be anything that can stand as a word **if the message were read aloud**. For example, *im soooooo* ☺ would be three words; *im happy* ☺ would be only two.

APPENDIX F

TRAINING PROCEDURES: PUNCTUATION CONTENT ANALYSIS

Your job is to identify eight types of punctuation errors (hereafter called the *Big Eight*) in a set of literary critiques. To do this efficiently and accurately, follow this procedure:

1. Become familiar with the Big Eight so that you will know what to mark and what to ignore.

2. Ensure that the Participant Number on the content analysis matches the Participant Number on the writing sample. If it does not, contact the researcher immediately.

3. As you read each literary critique, place brackets around each occurrence of the Big Eight.

4. Match each occurrence of the Big Eight in the writing sample to the appropriate category in the content analysis. Place a tally mark in the appropriate cell for each punctuation error.

5. Once you are done analyzing the writing sample, provide a total of punctuation errors for each category and for the entire writing sample.

6. Know which errors to ignore. The following chart provides examples of errors that should be ignored in your tally of errors.

Introductory words: added or missing commas after transitional words and conjunctive adverbs.
First Shakespeare used metaphor.   *Therefore the conclusion of the play was unsatisfying*.
Nonrestrictive elements: missing punctuation for nonrestrictive element after independent clause.
Macbeth killed Duncan who was the king of Scotland.   *Macbeth killed Duncan knowing that it was wrong to do.*
Compound sentences: using dash, semicolon, or colon to join two independent clauses.
Macbeth was wrong—and Lady Macbeth was wrong.   *Macbeth was wrong: the dagger before him was indeed fake.*   *Macbeth was wrong; and Lady Macbeth was wrong.*
Hyphenation: ignore added or missing hyphenation for *most* words.
Awkward constructions created by poor syntax, not punctuation.
Iago lied; yet, however, sympathize with him.
Compound constructions: added punctuation to certain compound constructions.
- Compound prepositional phrases   - Compound complements   *Shakespeare was a playwright, and a poet.*   - Added or deleted punctuation to correlative conjunctions.   ***Not only** was T. S. Eliot a poet, **but** he was **also** a playwright.*

- Added or deleted comma to coordinate adjectives.
  - *Beowulf* is an ancient, Old English poem.
  - *Beowulf* is a long, confusing poem.

Quotations, documentation, formatting: ignore mechanical or formatting errors with quotation or documentation.

- Hopkins made this statement, "Glory be to God for dappled things" (300).
- Ellipses before, within, or after a quotation
- Missing opening or closing parenthesis or quotation mark
- Awkwardly integrated quotations
- Formatting of titles of works
  - In "The Hollow Men", Eliot alludes to Conrad.

APPENDIX G

FORM OF INFORMED CONSENT

Unregulated Space: Text Messaging Habits as a Predictor of Punctuation Errors in the Academic
Writing of College Students
Robert R. Achuff
Liberty University
School of Education

You are invited to be in a research study about text messaging and academic writing. You were
selected because you are enrolled in a class that requires a writing assignment that I would like to
analyze. I ask that you read this form and ask any questions you may have before agreeing to be
in the study.

Robert R. Achuff, a doctoral candidate in the School of Education at Liberty University, is
conducting this study.

Background Information:

Though some studies have already examined the relationship between text messaging and
literacy, this study will examine the relationship between students' text messaging habits and
their ability to use punctuation in academic writing.

Procedures:

If you agree to be in this study, you will be asked to do the following:
1. Complete a survey found on Survey Monkey. Once you agree to participate in the study and
   provide your electronic signature below, you will be able to proceed to the survey.
2. Provide your student identification number, and identify your sophomore literature teacher's
   name. This information will allow the researcher to obtain from your teacher an electronic
   copy of your literary critique. Your student identification number will also allow the
   researcher to get confirmation from Pensacola Christian College that you have a minimum
   cumulative GPA of 2.0 and that you are at least 18.
3. Provide the number of text messages that you have sent in the last five days.
4. Transcribe at least five recent "sent" text messages, for a total of at least 50 words.
5. If you would like to be eligible for a chance to receive a $20 Starbucks gift card, provide
   your name and on-campus box number at the end of the survey.

Risks and Benefits of Being in the Study:

There are minimal risks in this study, no more than one would experience in day-to-day life.
However, because you will be transcribing actual text messages, I am bound by law to report

anything dealing with the following: child abuse, child neglect, elder abuse, or intent to harm self or others.

The benefits to society from your participation will help future researchers better understand the relationship that technology has to literacy.

Compensation:

Every twentieth participant who successfully completes the survey and meets other requirements will be eligible to receive a $20 gift card to Starbucks. To receive it, you will be asked to provide your name and on-campus box number at the end of the survey.

Confidentiality:

I am committed to keep your information confidential by preventing others from associating your name, on-campus box number, and student identification number with your text messaging data. I will do this by concealing your name, on-campus box number, and student ID from the printed survey and will conceal any personal information that may be found on your literary critique. When the printed surveys and literary critiques are not being analyzed, they (as well as any electronic backup copies on a flash drive) will be stored in a locked filing cabinet. After three years, all documents will be destroyed by shredding. As for the electronic documents, they will be stored on a password-protected computer; and those files (as well as any on a flash drive) will also be purged three years after the study is completed. If the findings of this study are ever given in a presentation or published in an academic journal, all findings will in no way identify who the participants are.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University or Pensacola Christian College. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

How to Withdraw from the Study:

If you choose to withdraw from the study, please contact the researcher at the e-mail address included in the next paragraph. Should you choose to withdraw, data collected from you will be destroyed immediately and will not be included in this study.

Contacts and Questions:

The researcher conducting this study is Robert R. Achuff. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact him at **rachuff@faculty.pcci.edu**. You may also contact the research's faculty advisor, Casey Reason, at creason@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd, Green Hall Suite 1887, Lynchburg, VA 24515 or email at irb@liberty.edu.

Please notify the researcher if you would like a copy of this information to keep for your records.

Statement of Consent:

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.)

Electronic Signature of Investigator: _____Date: _____

Do you agree to the above terms? By clicking "Yes," you confirm that you are willing to

participate in this study.

○ Yes

○ No

Provide electronic signature and date here:

Electronic Signature: _____

Date: _____