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Identification Of Differences Between Information Communicated By Text Messaging And Voice Message On Feedback

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IDENTIFICATION OF DIFFERENCES BETWEEN INFORMATION COMMUNICATED BY TEXT MESSAGING AND VOICE MESSAGE ON FEEDBACK

By

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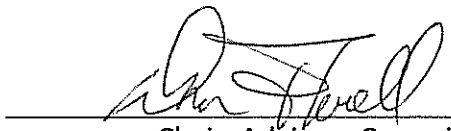

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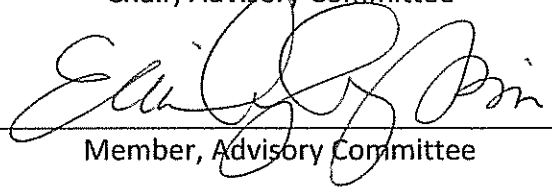

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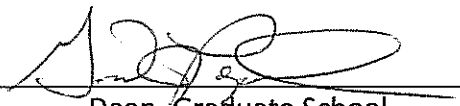

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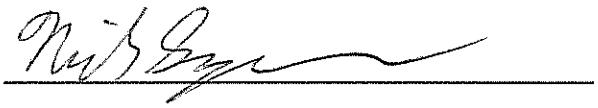
Signature 

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IDENTIFICATION OF DIFFERENCES BETWEEN INFORMATION COMMUNICATED BY TEXT MESSAGING AND VOICE MESSAGE ON FEEDBACK

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Submitted to the Faculty of the Graduate School of
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DEDICATION

This thesis is dedicated to my family and friends,
those who are still with me and those who are not, for
helping me to become the man I am today.

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Abstract

This study examined the modifying effect of communication via voice or text on a cellular phone as it relates to the effects of feedback on future performance, self-efficacy, and perceived face validity. Previous literature has established an effect of positive feedback enhancing future performance and self-efficacy, and negative feedback decreasing future performance and self-efficacy, but no research currently exists on how this effect can be modified by method of delivery over cellular phone. This study examined the effect of positive and negative feedback by having participants complete self-efficacy, face validity, and performance measures. The participants then received positive or negative feedback via voice or text message on their cellular phones, and then completed a second set of measures. The results of this study did not find the expected base effect of positive and negative feedback, and showed that the forms used by participants had significantly different results. However, using a method to center scores, it was found that receiving feedback by voice significantly increased future performance when feedback was positive, and decreased when feedback was negative, in comparison to receiving the feedback by text. Future research should seek to further validate the results of this study by replicating the findings using equivalent forms. It should also look at demographic factors in relation to this study's findings.

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INTRODUCTION

Information and communication technologies (ICTs) are rapidly spreading across the globe, constantly creating new ways of conveying and storing information. ICTs have become a part of the landscape of everyday life, with their use being involved in working, academia, and social functioning. Furthermore, ICTs have been shown to be effective ways of improving performance in academic and work functioning (Reedy, Luiselli, Thibadeau, 2001), and have also gained widespread use socially. These ICTs have also lead to difficulties as schools and workplaces struggle to use them most effectively (Farrell & Holkner, 2006; Unsworth, 2006). The constant user availability as well as the wealth of information may lead to stress in the workplace (Ayyagari, Grover, & Purvis, 2011) as workers continue working via these tools past their normally scheduled hours. Academically, ICTs, while offering the possibility of improved performance (Reedy, Luiselli, Thibadeau, 2001), must be studied to discover how they can be most effectively used, while also keeping in mind the training of their users. The training in the use of ICTs has been seen as a new form of literacy to some researchers (Sweeny, 2010; Walsh, 2010) and this new form of literacy in ICT use may have a positive impact on general literacy (Carroll, 2011). This supplementary effect reflects the viewpoint of many researchers in regard to the use of ICTs (Assar, Amrani, & Watson, 2010).

One of the ICTs that has seen use both in the workforce, socially, and even in academic settings is the cellular phone. In particular, a feature of cellular phones, SMS

text messaging, or texting, has seen wide-spread use. While for many of its users text messaging has been seen primarily as a social medium (Lu, Deng, & Weng, 2010), it has also seen use academically and in the workforce. The actual structure of a text message implies a level of intimacy and familiarity between those conversing (Spagnolli & Gamberini, 2007), which could possibly be an important component of text messaging being used effectively in non-social environments; however, even without taking this factor into account, text messaging has shown promise when introduced to academic settings as being a way to improve classroom satisfaction and performance (Martinez-Torres, Toral, Barrero, & Gallardo, 2007). This use of texting in academic settings occasionally employs other technologies to automate aspects of educational assignments (Day & Kumar, 2010). Text messaging has also been used in public health campaigns as a way of spreading important health information (Gold, Lim, Hellard, Hocking, & Keogh, 2010); this has shown promise, although some of these campaigns took into account the informal social use of text messaging in deciding the content of the messages being sent (Gold, et al).

Performance feedback has been shown to have effects on a number of variables, including performance (Cianci, Schaubroeck, & McGill, 2010; Belschak & Hartog, 2009; Rosenblum, Gordon, & Wuestefeld, 2000) and self-efficacy (Nesbit & Burton, 2006; Tolli & Schmidt, 2008; Miller & West, 2010). Performance feedback can be divided into positive and negative in terms of whether the performance being evaluated was good or bad, respectively; in turn, the effects it has can improve or worsen performance and

self-efficacy. In addition, performance feedback can have effects on variables such as effort (Belschak & Hartog, 2009; Venables & Fairclough, 2009), and satisfaction with the actual feedback (Stone & Stone,1984); this can lead to complex situations in which a person performs poorly, receives negative performance feedback, and then continues to do poorly partly as a result of the feedback. A potential exists for the creation of a cycle, or loop, for the person receiving negative feedback. However, studies have shown that negative feedback, when given in a certain way or when given with additional help and learning opportunities, can still lead to improved performance outcomes (Ilgen & Davis, 2000).

Performance feedback can also be provided in a number of forms, such as in person, via computer, written, or in combinations of forms. This variability, in which feedback can be provided, allows for a large number of ways in which it can affect other variables (Reedy, Luiselli, Thibadeau, 2001).

Self-efficacy is a trait that has an effect on many other areas of functioning. Within academia, one of the most important areas of functioning on which self-efficacy has an effect is academic performance. A higher self-efficacy leads to higher academic performance and a lower self-efficacy leads to lower academic performance (Hsieh, Sullivan, & Guerra, 2007). Self-efficacy also has an effect on numerous other variables (Sizoo, Jozkowskia, Malhotra, & Shapero, 2008; Bassi, Steca, Fave, & Caprara, 2007; Chemers, Hu, & Garcia, 2001) and can be divided into categories such as academic self-efficacy, math self-efficacy, or French language self-efficacy. This complexity of self-

efficacy has lead to a wide variety of studies in which self-efficacy's effects have been researched. Self-efficacy does appear to be a stable trait (Lane & Lane, 2001), although it can be affected and changed by events such as performance feedback (Duijinhouwer, Prins, & Stokking, 2010); this leads to an interesting situation in which performance feedback can cause self-efficacy to change at the beginning of a semester, and consequently leads to lower performance throughout the semester (Lane & Lane, 2001).

While studies have looked at the use of ICTs for delivering performance feedback, none could be found that specifically examined different modalities of cellular phone feedback delivery. In addition, it has been well-established that performance feedback can affect self-efficacy (Daniel & Larson, 2001; Miller & West, 2010; Nesbit & Burton, 2006; Duijnhower, Prins, & Stokking, 2010), but the possibility of an interaction between feedback type and delivery type has not been studied. This investigation will serve to demonstrate whether there is a differential effect of feedback delivery method on performance and self-efficacy, as well as whether these effects combine with feedback type to produce stronger or weaker effects. The objective of this research will be to find whether there is a difference in communicative ability of voice mail and text message received via cellular phone. This research will also seek to find any immediate short-term effect of feedback on performance of a basic verbal task. The variables by which this effect will be measured are performance on the task, self-efficacy, and perceived face validity of the performance measure. The research will contribute to further studies on the use of cellular phones in academic and other settings, as well as

demonstrating possible differentiations between text messaging and other forms of communication.

CHAPTER 2

REVIEW OF LITERATURE

INFORMATION AND COMMUNICATION TECHNOLOGIES

Information and communication technologies (ICTs) are becoming more and more prevalent in the world in which we live. ICTs include technologies such as computers, cellular phones, and the various communication programs of the hardware, such as video calling and text messaging. These technologies, as per their name, are causing changes in the way that people send and receive information, both in terms of format and content. These changes in how information is sent and received have the potential to change political and social structures (Cook, 2004); they usher in a need for a new form of technology-literacy (Sweeny, 2010) which could subsume other forms of literacy or serve to supplement existing ones. The end result is a shift in the manner in which people communicate which may result in significant societal changes.

Uses of ICTs

ICTs have the possibility of supplementing education around the world, including in impoverished areas or countries (Assar, Amrani, & Watson, 2010). ICTs, by their nature, allow better access to information and better ability to communicate with others. This naturally benefits education, as more access to learning information and communication with experts in the field or with other educators is possible. Particularly in impoverished areas, which lack the ability to purchase and house a large amount of physical resources, ICTs allow the consolidation of these materials to databases accessible offsite by the proper technology. In addition to the benefit of allowing greater

education access, ICTs also offer the ability to enhance learning of general literacy (Carroll, 2011). ICTs offer instant access to a large variety of resources, such as encyclopedias, dictionaries, and general or specialized search engines; these all offer the opportunity for the learner to both act as autodidact by searching for answers himself, and for the teacher to help the learner to better utilize the resources to improve learning. These opportunities have the possibility of acting as a cycle in which the teacher and student both use the technology to provide greater learning.

Research has been conducted regarding possibilities of replacing or substituting ICTs for current practices, such as supportive dialogue being conducted via video chat (Taylor, 2011). This research holds a lot of potential, as there are a wide variety of benefits possible to being able to conduct supportive dialogue, or even clinical therapies, over video chat as opposed to in person. However, results indicate that participants had reservations about the process based on eye contact, lack and interpretation of body language, and the two-dimensional nature of video chat. These findings point to a few of the most important aspects missing from contemporary ICTs. While video chat does exist, it does not adequately address issues of body language and eye contact, as demonstrated by this finding. Also, video chat continues to have a two-dimensional feel due to it being a screen projection as opposed to an in-person conversation.

ICT Demographics

One of the issues surrounding ICTs is the idea of a "gender divide," or a difference between genders in terms of accessibility and use of ICTs. This gender divide

has important ramifications given the rise of technological literacies. There is a possible risk of one gender becoming technologically illiterate in the use of some ICTs. There is evidence, however, that this divide is diminishing, or even disappearing (Joiner, Littleton, Chou, & Morahan-Martin, 2006).

TEXTING

The cellular phone is becoming one of the most widely used ICTs. According to information gathered by the Nielsen company (The Nielsen Company, 2010), the cellular phone sees more users in America (i.e., 223 million) than the Internet (i.e., 195 million). The cellular phone enables both mobile voice communication and the use of SMS messaging, or "texting." As the technology behind cellular phones becomes more inexpensive, use of them becomes more and more prolific. Cellular phones, given their widespread use, are coming to be seen as a necessity of modern life, similar to a car, refrigerator, or computer. This increase in cellular phone use leads to questions about the possible changes in communication that they can cause. The most basic cellular phone enables its user to communicate by voice or text to people within thousands of miles. The introduction of "smart phones" has allowed access to the internet as well as the ability to send pictures and video either online or directly to other cellular phones. While this has allowed the use of audio-visual communication on phones, it is possible that the use of text messaging will persist as an alternative form of communication. This raises the question of what possible differences exist between texting and other forms of communication in terms of information delivered.

Possibilities of Texting

The use of text messaging has an array of possibilities in its use for therapeutic and health-related purposes. Using texting to promote sexual health (Gold, Lim, Hellard, Hocking, & Keogh, 2010), had positive responses from participants, who particularly valued the informal language used by the promotion. In addition to this, participants were more likely to remember and share text messages that were "funny, rhymed, and/or tied into particular annual events." This positive response to informal language and humor could be used as a basis for future promotions. Participants were, however, relatively young (16 to 29 years old), and their positive response to humor may not carry over to other age demographics. There has been research completed on the feasibility of using texting in other treatment settings, such as with smoking cessation (Haug, Meyer, Schorr, Bauer, & John, 2009). Participants were willing to engage in and also maintain participation in a text message-based program; there was no significant difference in preference for intensity (i.e. number of text messages sent daily). Participants showed a willingness to utilize text messaging for personal treatment, which counters the possibility that texting may only be seen as a tool for enjoyment. Texting has a broad base of availability for its use and need not be limited to the social realm.

Texting has been tested as an aid for treating symptoms of mental disorders (Pijnenborg, Withaar, Evans, Bosch, & Brouwer, 2007). Text messages were sent to men suffering from schizophrenia who showed difficulty planning and remembering things. These text messages served as reminders of the men's daily activities. Men did seem to

benefit from these messages, and showed improvement in carrying out daily activities. This sort of cognitive impairment is not unique to schizophrenia, however, and it may prove to be effective in treating other disorders as well. This form of treatment works within the limitations of text messaging by using only brief reminders of activities. It also takes advantage of the constant accessibility of cellular phones, allowing the reminders to occur for the men at any time and place. Understanding the benefits and limitations of texting is important for utilizing it properly both in treatment and other fields. Texting has been used to aid in the recall of therapy goals for patients with brain injury (Culley & Evans, 2010). The treatment program was similar to that used for treating schizophrenia; participants were sent text messages reminding them of treatment goals and showed improve recall of their goals over participants in a control condition. While the treatment program was based on the assumption that consistent reminders will improve recall, its use of texting shows both that the assumption applies for that form of communication and that it can take advantage of the unique capabilities of texting. These reminders can be sent to the participants remotely, and will be available to them at any time or place. This eliminates a large amount of the difficulty in logistics for more traditional memory aids and shows that the uncontrolled circumstances in which the reminder is read and seen do not appear to change its effect.

The use of text messaging has been studied for its utility in an academic setting from an educator's standpoint. Texting has been used as a method to aid students' transition to university life (Harley, Winn, Pemberton, & Wilcox, 2007). Harley et al found that text messaging was the dominated use in comparison to other forms of

electronic communication. Students felt that text messaging was very important for maintaining social networks and providing emotional and social support. Based on this information, Harley et al support the use of a computer program allowing university staff to send text messages from their computers to students' phones, and believe that by adding these staff messages to the texting dialogue of students, social support can be enhanced and integration into university life can be eased. Texting has a lifestyle aspect as an ICT, and acts as both a support and a lifestyle itself, one which can be altered by adding to or changing its dialogue. Texting can be used to provide interactivity and greater motivation in education. Martinez-Torres, Toral, Barrero, & Gallardo (2007), found that the use of texting in a laboratory-based course allowed for greater amounts of both of these factors. Students in this course were able to utilize the technology being learned in the class to program their phone to send a text message. Interactivity and motivation levels both were shown to play an important role in learning performance. By taking advantage of the unique ability for texting to allow greater interactivity in a classroom setting, as well as the possibility of more motivational features, the course was able to show direct benefits of the technology for learning outcomes. Texting allows these characteristics with the ability for its users to communicate both instantaneously and unobtrusively, without interrupting the flow of the course. This allows the professor and students to interact on an individual level while still maintaining interactions with the rest of the group as well. Computer programs can be utilized with texting to provide learning opportunities (Day & Kumar, 2010). Research on student participation in a supply and business-based game showed a

strong positive reaction by students for the automation of the game using text messaging and a data base for calculations and information. Students were able to participate in the game by texting the database and receiving feedback with automated calculations on the game statistics and their actions within the game. This enabled students to focus on the strategy of the game as opposed to conducting calculations and maintaining bookkeeping for each action. While this game could have been simulated on a computer, the cellular phone format allowed students to participate with more immediacy and availability. However, this exercise did run on the assumption that all students had access to texting, and a small number of students with less access did give negative feedback on this. Automated texting services could be used as a way of not only communicating with students, but as a way of allowing students to directly interact with programs, remotely.

Texting has been used as a learning tool for new vocabulary (Cavus & Ibrahim, 2009). This research utilized a system known as the mobile learning tool (MOLT) as a way to introduce new vocabulary to undergraduate students. The results showed that students had greater word knowledge after the study than before it, and that the students enjoyed using the system. This finding links back to the concept of enjoyment while texting. It is possible that the actual structure and use of the MOLT system was enjoyable to students, or their enjoyment may have resulted simply from the use of text messaging. This component of enjoyment may prove important for future attempts to utilize text messaging as a learning tool. By planning for and incorporating enjoyment into the use of texting interventions and learning aids, educators and treatment

providers may be able to increase the effectiveness and acceptance of the learning aids and interventions. In addition to the use of text messaging for learning a primary language, texting has been utilized in aiding the learning of a second language (Lu, 2008). Students were presented with lessons on a second language in either print or with text messages. The results showed that students learned more from the text messages, in spite of the print material offering more detail. The students also reported positive attitudes toward learning vocabulary with their cellular phone. This research provides not only an example of the willingness of a group to utilize their cellular phone for learning, but also of the possibility of a cellular phone being superior to traditional learning; moreover, these students were members of a group that heavily utilized texting (Ling, 2010), which may be connected with their improved learning. The perceived intimacy of a texting conversation (Spagnolli & Gamberini, 2007) may provide an explanation for the greater retention, as students might pay more attention to text messages than to print material.

Text messaging has the ability to uniquely contribute to the maintenance and progression of close interpersonal relationships (Pettigrew, 2009). Users cited the aspects of texting being both more private than speaking aloud on cellular phones as well as allowing a more constant contact than voice communication. Given the intimate nature of these relationships, maintenance of privacy during conversation can be very important; this privacy allows the expression of thoughts, even in public, without the notice of others. The constant contact allowed by texting reflects this, as it is possible to maintain daily functioning and effectively multitask while holding a conversation via text

message, at least more so than during a voice conversation. Texting allows the dual expression of both autonomy and connectedness. It allows connected communication between partners while also creating physical autonomy as the partners are able to be separate and conduct other activities while remaining in contact. These factors distinguish texting from voice communication, showing that it allows unique forms of communication among its users.

The actual structure of a conversation via texting holds unique properties (Spagnolli & Gamberini, 2007). Some of the important characteristics of a conversation via texting are a lack of openings and closures, reciprocation on the part of both parties, and implicit or anticipated actions. These characteristics reflect several factors of the social presence of parties when using texting. The lack of openings and closures demonstrates a sense of constant availability, possibly due to the format of the technology, but also acknowledged implicitly by both parties. The reciprocation and implicit actions by both parties reflect a sense of equal commitment to the conversation, as well as an implicit understanding of each other by both parties. This social presence, in the form of immediacy and intimacy, reflects a unique aspect of communicating via texting and further sets it apart from other forms of communication.

Consequences of Texting

Using text messaging on a cellular phone requires different physical responses than communicating in person with someone through spoken conversation. Some of the physical responses that occur while texting may be detrimental, (Lin & Peper, 2009). While texting, people experience various symptoms of physical arousal, head and neck

pain, and hold their breath. These responses, which are enacted for stability while texting, may eventually lead to increased symptoms of muscle discomfort. This would seem to indicate a need to train people to lessen these responses while texting, but they would appear to be inherent to the act (need for stability). Thus, this finding brings up the issue of possible physical and mental detriments that arise from the use of ICTs, as well as the fact that they are unnoticed by their users. This creates a need both for further research on current ICTs and for research on future ICTs before introducing their use.

SELF-EFFICACY

Self-efficacy is a measure of a person's self-perceived ability to accomplish a task or perform. Self-efficacy can be further refined to reflect a number of specific tasks (e.g. mathematics self-efficacy, academic self efficacy, etc.), or it can be used as a general measure of a person's self-perceived capability to accomplish tasks or goals in general. Academic self-efficacy reflects an individual's self-perceived ability to accomplish tasks of an academic nature or in an academic setting.

Traits that Affect Self-Efficacy

One of the predictors of academic self-efficacy is prior academic performance (Elias & MacDonald, 2007). Elias and MacDonald found that prior academic performance predicted both academic self-efficacy and college performance. However, their study also found that academic self-efficacy explained a unique amount of variance beyond that explained by prior performance. This could reflect an exponential effect for academic performance and academic self-efficacy in which the academic performance

first informs the self-efficacy beliefs, which in turn go on to further predict aspects of future performance not predicted by prior performance. This study shows the unique character of academic self-efficacy as a predictive variable. Also, given the various factors that are known to affect academic self-efficacy, it raises the possibility of increasing it in spite of poor past performance. Within education, the classroom environment itself can predict self-efficacy (Fast, et al, 2010). Mathematics classrooms perceived by upper elementary school students to be more caring, challenging, and mastery oriented had higher levels of math self-efficacy. In addition to this, the math self-efficacy in turn predicted math performance. These factors of the classroom, when perceived by the students, corresponded to greater self-efficacy. This study can be utilized both as a proof of the effects of self-efficacy on academic performance, but also as a guideline for structuring classes in a way that increases self-efficacy. It is important to note that these classroom factors were perceived by the children, which could mean that perception is behind the higher performance as opposed to the actual classroom environment. It could also be the case that higher self-efficacy leads to these perceptions. Moreover, the current study does seem to indicate an effect of perceived classroom variables, which could guide future studies.

Self-efficacy has been shown to be affected by feedback, and the form of the feedback can also determine the extent to which self-efficacy is affected (Duijnhouwer, Prins, & Stokking, 2010). This study investigated whether feedback that included progress information had an effect on self-efficacy. Findings reflect that progress feedback did not by itself increase self-efficacy, but that a threshold number of progress

comments had to be reached in order for a significant increase to occur. This research shows the importance of understanding the level of feedback that needs to be given in order for an effect to occur on self-efficacy. The simple presence of feedback was not shown to be related to self-efficacy increases. This finding is important for understanding feedback's effect on self-efficacy, as well as for informing other research on self-efficacy. It is possible that other variables that may or may not affect self-efficacy also require a threshold to be reached before the impact occurs.

Self-Efficacy Effects

Self-efficacy has been shown to relate to a person's actual task performance (Sizoo, Jozkowskia, Malhotra, & Shapero, 2008). This self-efficacy, as a measure of student's belief that they could perform in a task, was shown to relate to a measure of anxiety over a course in finance. These measures are thought to be related due to lesser amounts of self-efficacy increasing anxiety about the course as students believe that they will be unable to complete the course. This research could indicate a more general relationship between anxiety and self-efficacy; as self-efficacy decreases, anxiety may increase. While this possibility is not shown by this study, it is important to consider it when looking at the effects that self-efficacy can have.

Self-efficacy can have an effect on general academic standing (Hsieh, Sullivan, & Guerra, 2007). Hsieh, Sullivan, and Guerra found that self-efficacy was positively related to academic standing. The authors noted that goal orientation was related to academic standing, with mastery goals being positively related to academic standing. In addition to this, students with high self-efficacy who were on low academic standing had more

performance avoidance goals. This research demonstrates the importance of looking at self-efficacy in combination with other variables. If a person's goal is one that relates to higher performance, it is possible that high self-efficacy will relate to higher performance. Conversely, it is possible that a goal that is not related to higher performance will not result in high performance even if self-efficacy is high.

Vancouver and Kendall (2006) found that self-efficacy was actually negatively related to motivation and exam performance when examined at the within-person level. This result reflected a positive relationship between self-efficacy and performance at the between-persons level and may reflect a tendency at the individual level for self-efficacy to act as a form of overconfidence, causing students to perform at a lower level as a way of "coasting" on past performance. The study found a positive relationship between past performance and self-efficacy. If this possibility of self-efficacy to cause coasting within the individual is the case, it would require greater scrutiny for fluctuations in self-efficacy in individuals. The finding of a positive relationship between self-efficacy and performance at the between person's level may reflect a more global tendency for self-efficacy to have positive effects on performance, on average.

Academic self-efficacy is related to other variables within the context of a university setting (Chemers, Hu, & Garcia, 2001). Academic self-efficacy was both directly and indirectly related to various aspects of academic performance and adjustment. Along with optimism, academic self-efficacy directly positively related to academic performance. The two variables influenced expectations and coping perceptions, which in turn were positively related to classroom performance, health,

and satisfaction and commitment to remain in school; expectations and coping perceptions also negatively related to stress. These findings implicate the wide variety of variables affected by academic self-efficacy. The indirect relations through expectations and coping perceptions show the preliminary importance of academic self-efficacy. The study focused on first-year university students, and their beginning perceptions of ability and optimism affected a wide spectrum of their functioning and performance in the university. This information is important in identifying preliminary indicators of strong and poor performance in the university setting. Another study found a relationship between self-efficacy and academic adjustment (Brady-Amoon & Fuertes, 2011). The study found that self-efficacy was positively correlated with adjustment. Brady-Amoon and Fuertes examined self-ratings on abilities as an independent construct to self-efficacy and found that, while correlated, the constructs appeared to be distinct. The authors found that self-efficacy was related to academic performance. Brady-Amoon and Fuertes found no association between SAT scores and GPA, indicating that self-efficacy is a stronger predictor; they attribute this result to the diversity of their sample when compared to others. This finding, if replicated, could have important implications for academic institutions on judging potential academic performance of their students.

Traits of Self-Efficacy

Self-efficacy has been shown to have a mediating effect on the relationships between some variables and academic performance (Thijs & Verkuyten, 2008). Thijs and Verkuyten found that experiences of peer victimization were negatively associated with

both class-based and test-based academic achievement. However, this effect was mediated by self-efficacy. Victimized students appeared to do more poorly due to lower self-efficacy than due to the victimization itself. This research demonstrates that self-efficacy can be isolated as a variable when conducting measures to improve its' related constructs such as academic performance. Although peer victimization was shown to be related to poor academic performance, the ultimate effect was a result of self-efficacy. Given that self-efficacy is not an either/or occurrence like victimization, and the fact that self-efficacy has been shown to be positively affected by other factors, this means that academic performance as predicted by self-efficacy can be improved. It further conveys that the effect that peer victimization has on academic performance may not necessarily be a permanent one.

FEEDBACK

Performance feedback is the communication of an individual or group's effectiveness at a task. This communication can be given through a number of methods, including in-person, via phone, or electronically with the use of ICTs. Feedback can be given as a combination of these methods. While feedback can be divided into positive or negative, generally, it can convey other more neutral information. Negative feedback is feedback that communicates that the task was not performed adequately, while positive feedback is feedback that communicates that a task was performed adequately or better. This definition can shift, however, given the context and expectations of the individual or group being given feedback.

Effects of Feedback

Performance feedback has been shown to affect self-efficacy and anxiety (Daniels & Larson, 2001). The authors found that giving pre-arranged false feedback on counseling performance to master's-level counselors in training resulted in changes in both self-efficacy and anxiety. Negative feedback resulted in decreased self-efficacy and increased anxiety, while positive feedback resulted in increased self-efficacy and decreased anxiety. This increase in anxiety could have interesting effects on people with pre-existing issues with social anxiety, possibly increasing the existing social anxiety. Given the social component of feedback when given in person, this could contribute to the social anxiety. There could be a component of the importance of the act on which the feedback is being given. Given that counselors are responsible both for their own progress and for helping their clients, this raises the perceived importance of their work and thus contribute to increased anxiety levels when negative feedback is received. Miller and West (2010) found that positive feedback did increase self-efficacy and performance expectations while negative feedback decreased them. Attention to the task being evaluated was shown to have an interaction between feedback, age, and control beliefs. Older adults who received high performance feedback displayed higher attention to the task than their peers.

Performance feedback can have a number of effects on self-efficacy based on perceptions of expectation discrepancies with actual performance, perceptions of justice, and satisfaction (Nesbit & Burton, 2006). Perceptions of justice represent the participant's satisfaction based on performance feedback they receive and their self-

perceived performance; feelings of injustice arise when there is a discrepancy between self-perceived performance and performance feedback. In particular, it was found that students with negative perceptions of justice had lower self-efficacy and satisfaction after receiving poor feedback than those who did not have perceptions of injustice. If students with perceptions of injustice received moderate to high feedback, their self-efficacy actually rose. This presents a complicated picture in terms of the effects of feedback and perceived justice. Seemingly, persons with perceptions of injustice receive the greatest effect on self-efficacy from feedback, both positive and negative. This again demonstrates the importance of individual variables on the interpretation of feedback. It demonstrates the effects that feedback can have not only on future performance, but on other individual variables, such as self-efficacy and satisfaction. Feedback has been shown to contribute to positive and negative affect among workers receiving job performance feedback (Belschak & Hartog, 2009). Specifically, positive feedback was shown to elicit positive affect, while negative feedback was shown to elicit negative affect. This negative affect was increased if the feedback was presented publically, though positive public feedback had no effect on positive affect. This research adds to the consequences and effects that feedback can have on a people, but also adds the extra variable of public versus private feedback. As previously stated, feedback is not given in a vacuum, and the context of both the individual receiving the feedback as well as the environment in which the feedback is given can both have effects on the feedback's outcome. In addition to this, feedback has an effect on future work behaviors, with negative feedback being related to a desire to leave the job and

purposeful poor performance, and positive feedback being related to purposeful better performance. These show a more conscious decision by the person receiving feedback on how to react to it, which is in contrast to some of the less conscious reactions to feedback such as satisfaction and self-efficacy. This demonstrates that feedback can affect a person both consciously and unconsciously.

Negative feedback has been shown to produce reactions that result in lower work performance, in spite of the person receiving the feedback being capable of higher performance (Ilgen & Davis, 2000). Ilgen and Davis looked at ways to deliver negative feedback which could mitigate this outcome. They found that negative feedback resulted in two main choices for the recipient: the choice of whether to continue putting effort into the task, and the choice of how to improve their performance if they do continue their effort. The authors suggest that framing the task as a learning one, minimizing aspects of competitiveness, and minimizing stable internal attributions to failure could all aid in mitigating lower performance. Further, providing guidance on the second choice of how to improve future performance was thought to be important. There can be some debate on the practicality of delivering realistic but negative feedback when the feedback is shown to lead to lower future performance. However, this effect does have the possibility of being moderated by the way in which the negative feedback is given. This could require greater effort in giving negative feedback than positive on the part of the person delivering the feedback, such as providing guidance on how to improve future efforts. Performance feedback has the potential to cause lasting effects in performance, which no longer require feedback to continue

(Rosenblum, Gordon, & Wuestefeld, 2000). The research found that performance feedback used to guide accuracy in an auditory time-to-arrival task improved performance over a session with no feedback, and that a later session in which that feedback was not given showed continued heightened levels of performance. This research indicates that performance feedback can be used to guide recipients toward improved performance and that this guide can persist when the feedback is no longer being used. This may be due to a learning threshold for the task, which once passed, is easily maintained. Even if this is the case, however, this performance increase would likely not have occurred without the performance feedback, which served as a catalyst. There could be other areas in which a one-time session performance feedback would allow for permanent gains in performance. This research adds the implication that performance feedback does not necessarily need to be maintained in all cases.

Feedback can serve as a catalyst for a person's goal orientation's relationship with performance to change (VandeWalle, Cron, & Slocum, Jr., 2001). Research demonstrates that three types of goal orientations showed relationships with performance in a series of two tasks after feedback was provided for the first. A learning goal orientation (the participant had a goal of learning through the task) showed a positive relationship with performance and an avoiding orientation showed a negative relationship. A proving goal orientation (the participant had a goal of proving their ability through the task) showed a decrease from positive to nonsignificant, however. This could be a result of the first trial fulfilling the goal of "proving" oneself, resulting in decreased effort in the second trial. While these goal orientations did appear to affect

performance, feedback did cause a change in this relationship for one of them. This change in relationship may be due to fulfilling the goal orientation, which indicates that goals specifically relating to feedback are going to be more strongly affected by it.

Performance feedback can have an indirect effect on people, with its effect on one characteristic leading to the influence of another (Tolli & Schmidt, 2008). Research has shown that performance feedback influences self-efficacy, which in turn influences goal revision. Performance feedback's influence on self-efficacy actually interacts with attributions to produce the effect on self-efficacy. Although this study showed that positive feedback produced increased self-efficacy and negative feedback produced decreased self-efficacy, with both internal and external attributions, the two variables still displayed an interaction. Further, the study showed that self-efficacy was positively related to goal level. This study demonstrates the interactions that feedback can have at multiple levels interacting with other variables, such as attributions or self-efficacy to influence change in others.

What Affects Feedback

The immediacy of feedback may play a role in its effectiveness (Ho & Whitehill, 2009). A study of clinical practicum students in speech-language pathology showed that students who received immediate verbal feedback in a group showed better performance on a clinic evaluation form than students who received delayed written feedback. In addition to immediacy, this study may indicate the importance of verbal versus written, and group versus individual feedback. Any or all of these variables could contribute to the effect that feedback had on performance. Using ICTs for feedback

would be able to aid in some of the characteristics of the immediate verbal feedback in a group, but would also have difficulty with others. ICTs would lose some of the face-to-face social interaction of verbal feedback and a group, but this could be mitigated by public discussion in electronic format of the feedback. The feedback would also be available in a more immediate manner with ICTs, which could provide written feedback via text message or another ICT.

There are a number of relationships between feedback favorability and number of feedback agents on the perception of task competence and of the feedback's accuracy (Stone & Stone, 1984). More favorable (positive) feedback was shown to increase self-perceptions of task competence, whereas less favorable (negative) feedback was shown to decrease perceptions of feedback accuracy. In addition, the number of persons delivering feedback had a positive relationship with self-perceptions of task competence. This results in several interesting issues. First, it demonstrates the ability of feedback to change feelings of task competence, and this effect is increased with the number of persons giving this same feedback. However, the perceived accuracy of the feedback relating to how positive it is poses a problem for giving accurate feedback in cases of actual poor performance. If the feedback is not considered to be accurate, difficulties can arise for both the recipient and deliverer of the feedback. This research shows the malleability of feedback reactions to what would appear to be objective data, based on what the data is actually saying, and the consensus by others on the data.

When using computer-based feedback, it is important to remember the differences that it may have from person-generated feedback. Karlsson, Liljestrom, and Juslin (2009) examined student reactions to computer versus teacher feedback on the emotional content of the student's musical performances. They found that students judged teacher feedback as higher both when they believed that it came from a teacher, and when the feedback actually did come from a teacher. The students rated both rating systems as easy to understand, but found teacher feedback to be more detailed. Students also preferred the teacher feedback due to it offering encouragement, examples, and explanations for the students. This research shows the importance of understanding the aspects of feedback that are most appreciated when designing computer feedback. Computer feedback has a number of advantages over in-person feedback, including better objectivity, and greater mobility and lesser constraints on time and place. However, computer feedback can be improved by studying the differences between it and in-person feedback, as this research reflects.

Methods of Delivering Feedback

It is now possible to give feedback utilizing ICTs. It appears that this feedback is able to improve performance, when paired with face-to-face feedback (Reedy, Luiselli, Thibadeau, 2001). A study in which staff in a human service organization received data feedback on their completion of certain recording procedures, along with a performance review by a supervisor, showed an increase in the relevant procedures when compared to a baseline. This study demonstrates the basics of how ICTs can be used to aid and enhance feedback procedures. At this basic level, ICTs can aid in the

creation of hard data which enable a person to see objective and quantifiable reports on his or her performance.

FACE VALIDITY

Face validity has a particular impact in regards to personality tests (Sartori, 2010). Sartori divides personality tests into two categories: projective techniques and psychometric instruments. Sartori had subjects comparing these two categories and stating their preferences. The subjects acknowledged that psychometric instruments are "credible and scientific," but preferred projective techniques. This preference was strongest for females, people younger than 22, and lower-educated participants. This study reveals a conflict between statistically validated measures versus the preference of the people being measured by them. While the face validity of a measure does not appear to impact its other validities, it could cause issues with rapport or willingness to accept test results, although these possibilities are not indicated by the current study.

Face validity may be affected by the format in which a test is conducted (Chan & Schmitt, 1997). Chan and Schmitt found that face validity was higher for a test conducted by video as opposed to one conducted by paper-and-pencil. This research allows for the possibility of face validity being affected by the ICTs. A test conducted with an ICT may possess greater face validity than an equivalent test being conducted by traditional paper-and-pencil. This implication may even stretch to the judged validity of feedback received by ICT versus in-person.

THE PRESENT STUDY

The purpose of this investigation is to examine the possible interaction effect of cellular phone delivery method on the known effect of feedback. This investigation adds to the literature by investigating both the possibility of differential communicated information by cellular phone as well as finding whether this difference applies to a known effect. The consequences of these possible effects on self-efficacy and performance were discussed previously. This study divides subjects into groups receiving either positive or negative feedback by either voice mail or text message. Given the previous research on feedback, it is hypothesized that positive feedback will relate to improved performance while negative feedback will relate to worse performance. It is also hypothesized that, given the literature, positive feedback will relate to increased self-efficacy while negative feedback will relate to decreased self-efficacy. In addition to this effect of feedback on self-efficacy, it is hypothesized that higher self-efficacy will relate to higher scores on the verbal measure, while lower self-efficacy will relate to lower scores on the verbal measure. Although there is a scarcity of research on the contextual aspects of information communicated via cellular phone and text message, it is hypothesized that type of feedback delivery will have an interaction with feedback type. The direction of this effect is not hypothesized, due to the lack of previous research to guide the decision. Finally, given the research on perceptions of justice in regards to feedback, a measure of face validity is included to approximate the perception of justice (Chory & Westerman, 2009) toward the measure. It is hypothesized that positive feedback will be related to a higher perception of face

validity while negative feedback will relate to a lower perception of face validity, and that delivery type will have an interaction with this effect.

CHAPTER 3

METHOD

SUBJECTS

Fifty-two participants were chosen from a pool of Eastern Kentucky University undergraduate students attending courses on campus. The participants signed up for the study using an online system. Participants enrolled in psychology courses participate in research as part of their course grade, and were free to choose from a variety of studies on the online listing. Participants were also solicited to participate in the study by the experimenter, who briefly detailed the study and demonstrated how to sign up for it online. The demographics of the participants should reflect that of the general undergraduate student populace of Eastern Kentucky University.

PROCEDURES

During recruitment for the study, participants were asked to bring a personal, cellular phone capable of receiving both voice and text messages. At the beginning of the study, participants provided their phone number and were sent a test message on their phone. Participants were run in a group of no more than twenty participants in a single room. Typical group sizes were one to four participants, but the largest amount of participants run at a single time was twelve. For this research design, participants were divided into four main groups: Positive Feedback via Text; Positive Feedback via Voicemail; Negative Feedback via Text; and Negative Feedback via Voicemail.

During the actual study, participants in each condition were instructed on the task being given to them; they were told that they would be given their feedback for the

task on their cellular phone rather than in person. The participants were told that they would be taking a test on verbal ability that reflects overall performance in college, as well as measures on how they perceive themselves and how they perceive the verbal ability test. Participants were asked for their cellular phone number at the start of the study and told that the experimenter's copy of the number would be deleted upon completion of the study session. Participants were randomly assigned to a group, given an ID number to write on their test forms, and then were sent a text or voice message, depending on their group (i.e. participants in the positive voice group received a voice test message). The system sending the messages was a paid online service that could send text messages or pre-recorded voice messages. Due to the nature of cellular service and the online service, participants experienced a delay of one to five minutes between the message being sent on the service, and the receipt of the message. Once each participant's phone number was confirmed to work, the participants were then administered this measure. Participants were randomly assigned to receive Form 1 or Form 2 of the verbal measure first, followed by the other form.

Once all participants in the group had completed their first set of measures, the examiner entered their scores into a spreadsheet on a portable computer. These scores were not actually calculated, but served as a screen to show that the experimenter was entering the participants' scores into the computer. The participants then received feedback based on their condition, again with a 1 to 5 minute delay between the service sending the message and the receipt of the message by the participant. During this time, participants were encouraged not to talk to each other or communicate with

anyone on their cellular phones. After each participant was confirmed to have received their feedback and understood it, the second set of measures was administered. After all participants completed the second set of measures, the experimenter briefly explained the purpose of the study and deleted participants' phone numbers from the service.

MEASURES

The participants were given a measure of performance in the form of verbal synonyms and antonyms. This method was chosen due to its similarity to verbal analogies used on the ACT and SAT tests, with which most college students should be familiar; in addition, this similarity is thought to lend a level of credibility to the participants being told that this test reflects their academic potential.

Questions were chosen from a book of practice antonyms and synonyms (Dermott, 2002) due to their moderate level of difficulty. Due to this level of difficulty, it was thought that participants would be able to accept having higher or lower scores due to the false feedback they received, as well as not being so difficult as to not allow for an improvement in score.

Form equivalency was calculated by administering the full set of questions to a class of 25 students. The percent of students who answered each question correctly was calculated, and each form was designed to have an equivalent number of questions with correct percentages.

The measure of self-efficacy chosen for this investigation was a set of Likert Scale-style statements asking about the participant's self-perceived capabilities and

abilities to perform in college; these statements were adapted from a measure created by Lane and Lane (2001), and are a measure of academic self-efficacy. Lane and Lane reported a test-retest reliability for this measure, but they did not report the internal consistency values. The adaptations for the measure consisted of changes from British dialect and terms to American ones (e.g. “re-sits” changed to “retakes”), as well as changing the width of the responses (i.e. from 10 responses to 5). The first four statements of the measure contribute to a basic academic self-efficacy score, and the last three statements were looked at separately, as they each represent an expected level of grades (i.e. 90-100%, 80-90%, 70-80%). The lowest score for the first four questions would be a total of 4, while the highest would be a total of 20. A high score represents high academic self-efficacy while a low score represents low academic self-efficacy. The modified academic self-efficacy scale had a Cronbach’s alpha of .65 and is considered an internally reliable scale (Devellis, 1991). The small number of items in the scale could have affected the reliability coefficient in that it has been shown that Cronbach’s alpha estimation of reliability increases with scale length (Cronbach, 1951; Voss, Stem, and Fotopoulus, 2000). Questions were presented identically before and after completing the verbal measure.

The question with respect to face validity is the same Likert Scale format as those on self-efficacy. The first statement reflects how the participant perceives the upcoming test’s ability to show academic potential while the post-test question asks the same thing about the now-completed test; this question was created for this study.

The order of measures for the first part of the test was the self-efficacy questions, followed by the face-validity question, followed by the verbal measure. The second set of questions was in inverse order, with the verbal measure first, followed by face validity, followed by the self-efficacy questions. The self-efficacy and validity measures were presented first in order to gauge those factors based on the participant's experience before taking the measure, while the second verbal measure was presented immediately after the feedback in order to take advantage any possible immediacy effect.

(All measures used are included within the Appendices)

CHAPTER 4

RESULTS

The table below (Table 1) shows frequencies for feedback type and feedback delivery method.

Table 1
Frequencies of Feedback Type and Delivery

	Frequency	
	Voice Feedback	Text Feedback
Positive Feedback	13	13
Negative Feedback	13	13

A Repeated Measures ANOVA found that there was no significant effect of feedback type or delivery on test measure scores ($F (1, 48) = .90$, $p = .35$). In addition, it was found that there was no significant difference between scores on the first and second test ($F (1, 48) = .90$, $p = .35$). To avoid practice effects, two forms of the vocabulary test were created, and these forms were counter-balanced across participants. There was a significant difference between the mean scores of each form ($F F (1, 48) = 5.09$, $p = .03$). An ANOVA showed that there were no significant differences between the groups based on which form they took first, $F (1, 50) = 0.22$, $p = .63$. As a result of the non-equivalent forms, each participant was assigned a new score by taking the average score of the form for which they took their first or second test and subtracting it from their score on that form, and analyzing these new "centered" scores. A repeated measures ANOVA of these scores found that mean scores on the first test ($M = 2.19$) were significantly higher than those on the second test ($M = 1.69$), but these scores showed no significant effect for feedback type or delivery. However, an interaction was found between feedback type and delivery for these scores; feedback

given by voice was shown to have both a stronger positive effect and negative effect ($F(1, 48) = 6.209$, $p = .016$) than feedback given by text. Positive voice feedback caused a greater increase in performance as opposed to the decrease from positive text feedback, and negative voice feedback caused a greater decrease in performance than negative text feedback (See Figures 1 and 2). See Table 2 for means and standard deviations of these scores.

Table 2

Means and Standard Deviations of Verbal Measure Scores

	Positive Voice Feedback		Positive Text Feedback		Negative Voice Feedback		Negative Text Feedback	
	Means	Std. Dev.	Means	Std. Dev.	Means	Std. Dev.	Means	Std. Dev
Pre-Feedback Test Scores	7.38	2.14	6.31	2.14	7.54	3.01	6.92	1.71
Post-Feedback Test Scores	7.85	2.51	5.46	2.15	7.23		6.54	2.11
Form 1 Scores	7.46	2.37	6.46	2.47	8.08	3.79	6.85	1.86
Form 2 Scores	7.77	2.32	5.31	1.65	6.69	3.07	6.62	1.98
Centered Pre-Feedback Scores	0.01	2.37	0.01	2.47	0.01	3.07	-0.01	1.86
Centered Post-Feedback Scores	0.31	2.31	-1.15	1.65	-1.38	3.68	-0.23	1.98

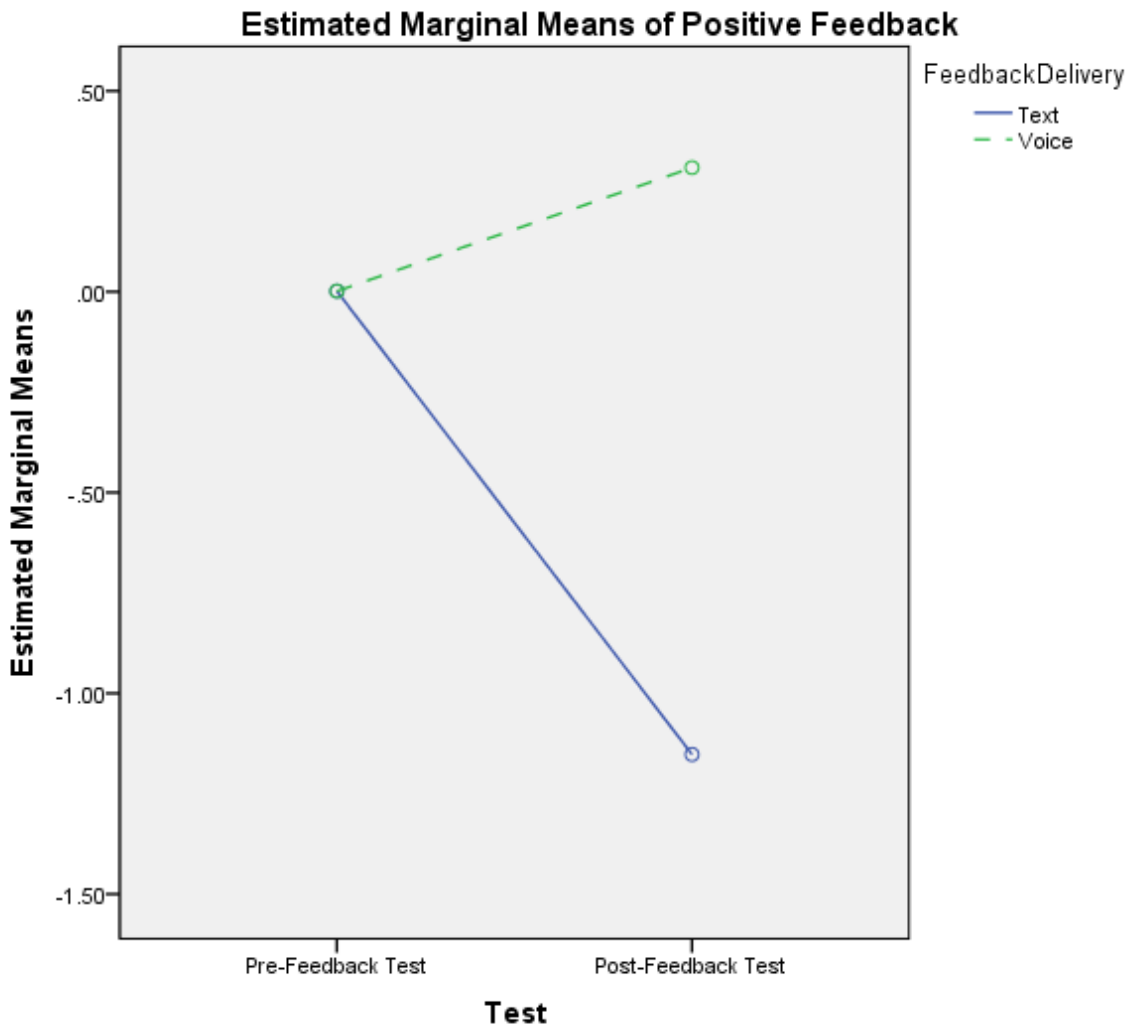

Figure 1 Pre-Feedback Test and Post-Feedback Test Comparison of Participants Receiving Positive Feedback by Use of Centered Scores for Verbal Measure

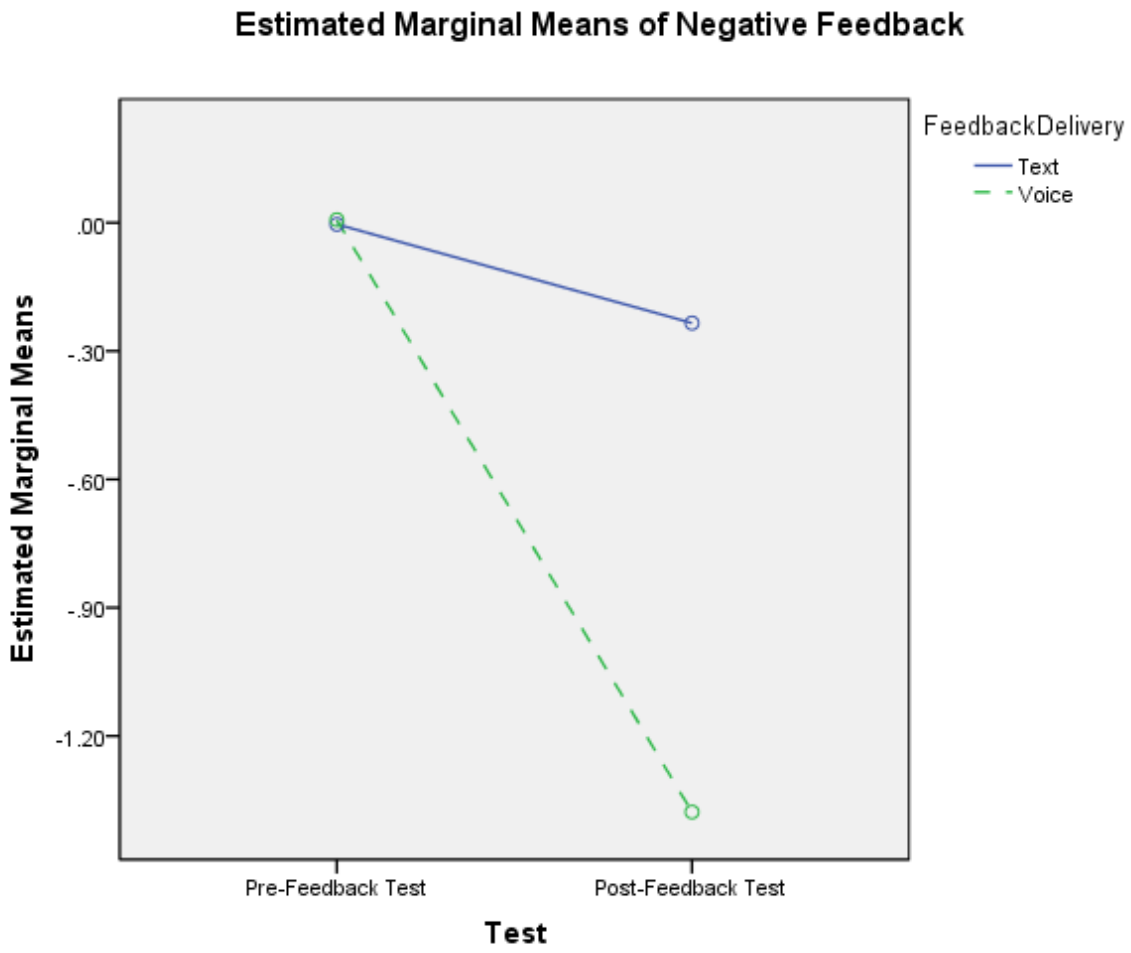

Figure 2 Pre-Feedback Test and Post-Feedback Test Comparison of Participants Receiving Negative Feedback by Use of Centered Scores for Verbal Measure

The self-efficacy questions were effectively divided into two measures, one comprised of the first four statements, and a second measure composed of the last three, which were analyzed individually. A repeated measures ANOVA was calculated for the sum of scores on the first four questions of the five-point Likert scale measurement of self-efficacy and feedback method or delivery (See Table 3 for means and standard deviations). There was no significant difference found between the pretest measure of self-efficacy and the post-test measure of self-efficacy ($F(1, 48) = 1.76$, $p =$

.19), nor was there an effect of feedback type or delivery (F (1, 48) = .325, p = .807). The latter three questions of the self-efficacy measure had their differences between pre- and post-feedback calculated, and an average was created. An ANOVA was calculated for this average and found no significant effect on the scores for Feedback Type (F (1, 48) = 0.18, p = .68), Feedback Delivery method (F (1, 48) = 0.49, p = .49) or an interaction between the two (F (1, 48) = 0.20, p = .89) There was also no significant difference found between pre- and post-test questions about the participants' belief that they would receive an A (90%-100%) grade on future assignments or their belief that they would receive a B (80%-90%) grade. However, there was a significant difference found between participants' pre- and post-test questions that they believed they would receive a C (70%-80%) grade on future assignments (F (1, 48) = 6.857, p = .012). The mean scores of the participants' post-test answers were actually higher (M = 3.154) than the pretest answers (M = 3.000). There was no effect on these scores by feedback type or delivery, however.

Table 3

Means and Standard Deviations of Self-Efficacy Scores

	Positive Voice Feedback		Positive Text Feedback		Negative Voice Feedback		Negative Text Feedback	
	Means	Std. Dev.	Means	Std. Dev.	Means	Std. Dev.	Means	Std. Dev
Self-Efficacy Pre-Feedback	16.77	2.01	15.54	1.85	16.31	1.75	16.69	2.18
Self-Efficacy Post-Feedback	16.38	1.76	15.85	1.82	16.08	2.02	16.23	2.35
Future Grades 90-100% Pre-Feedback	2.92	0.64	2.85	0.80	2.92	0.64	2.85	0.99

Table 3 (Continued)

	Positive Voice Feedback		Positive Text Feedback		Negative Voice Feedback		Negative Text Feedback	
	Means	Std. Dev.	Means	Std. Dev.	Means	Std. Dev.	Means	Std. Dev.
Future Grades 90-100% Post-Feedback	2.92	0.76	3.00	1.00	3.15	0.55	2.92	1.04
Future Grades 80-90% Pre-Feedback	3.92	0.64	3.54	0.78	3.85	0.55	3.23	1.24
Future Grades 80-90% Post Feedback	3.85	0.55	3.62	0.65	3.85	0.69	3.46	1.27
Future Grades 70-80% Pre-Feedback	2.85	1.28	3.23	1.24	3.23	1.24	2.69	1.25
Future Grades 70-80% Post-Feedback	3.08	1.26	3.38	1.39	3.31	1.18	2.85	1.34

Participants' belief that the measure reflected their academic potential actually decreased from pre- (M = 2.963) to post-test (M = 2.327), as shown by a repeated measures ANOVA ($F(1, 48) = 28.74$, $p < .001$). No significant difference was found for the pretest and post-test beliefs as affected by feedback type or delivery. See Table 4 for descriptive statistics.

Table 4

Means and Standard Deviations of Face Validity Scores

	Positive Voice Feedback		Positive Text Feedback		Negative Voice Feedback		Negative Text Feedback	
	Means	Std. Dev.	Means	Std. Dev.	Means	Std. Dev.	Means	Std. Dev
Pre-Feedback Face Validity	3.46	0.97	2.92	1.12	2.85	1.14	2.62	1.12
Post-Feedback Face Validity	3.08	0.86	2.92	1.19	1.77	1.01	1.54	0.66

There were multiple significant correlations between the variables of the various measures, primarily between pre- and post-test measures, as well as the first and second administration of the measures themselves. The pre-test self-efficacy score correlated with the score on both the first (R= .388, p = .005) and second (r = .434, p = .001) verbal test scores (See Table 5), as well as the scores on form 2 (r = .276, p = .048). The post-test self-efficacy scores score also correlated with the pre- (r = .378, p = .006) and post-test (r = .319, p = .021) scores on the verbal measure

Table 5
Self-Efficacy Correlations

		SEPreScore	SEPostScore	PreTest	PostTest
Self-Efficacy Pre-Feedback	Pearson Correlation	1	.871**	.388**	.434**
	Sig. (2-tailed)		.000	.005	.001
	N	52	52	52	52
Self-Efficacy Post-Feedback	Pearson Correlation	.871**	1	.378**	.319*
	Sig. (2-tailed)	.000		.006	.021
	N	52	52	52	52
Verbal Test Score Pre-Feedback	Pearson Correlation	.388**	.378**	1	.695**
	Sig. (2-tailed)	.005	.006		.000
	N	52	52	52	52
Verbal Test Score Post-Feedback	Pearson Correlation	.434**	.319*	.695**	1
	Sig. (2-tailed)	.001	.021	.000	
	N	52	52	52	52

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

CHAPTER 5

DISCUSSION

While this study has not shown the expected results of feedback type directly affecting test performance, it has shown a correlation between performance and self-efficacy, as well as an interaction between feedback type and delivery's effect on test performance. It is important to note that the significantly higher scores both on one form over another, as well as on the first form given, indicate issues within the study that will be discussed further. However, the interaction between feedback type and delivery, as well as the correlation of self-efficacy with performance are both interesting findings. Of note also is the result that positive feedback provided by text message actually resulted in decreased performance, though not significantly. Given the generally low average performance, especially in comparison to the positive feedback score, participants may have found the text message less believable than the voice recording, resulting in lower subsequent performance. Given the lack of significance, this result could also simply be a quirk of the results. The higher scores on the post-test question for the participant's belief that they will receive C's on future assignments may reflect a diminished sense of optimism on the participant's part upon being given actual experience with a test of verbal ability. Given the lower scores that participants had on the second measure, these lowered expectations may reflect a readjustment of the participant's beliefs to match their perceived performance.

The interaction effect found for feedback type and feedback delivery on test performance appears to show that receiving feedback by voice has a stronger effect, for

good or ill. This may reflect a greater propensity for participants to listen or attend to feedback presented by voice, or it may reflect a greater level of authority or accuracy attributed to voice feedback by participants.

The correlations found between the variables show that pre- and post-test measures all seem to be related to their counterparts. Notable correlations include those between the pre- and post-test self-efficacy scores and the scores on the actual measures of verbal ability, which would seem to indicate that higher self-efficacy is related to higher scores on the measures. The negative correlation between the pretest question on the ability of the measure to predict academic potential and the score on the first measure may indicate that participants preemptively distanced themselves from the validity of the measure before actually taking it, perhaps due to previous poor performance. The lack of correlation with the second measure may indicate that participants, upon actually being exposed to the measure, recognized its validity in spite of their lower performance.

The hypothesis that positive feedback would improve performance while negative feedback would decrease it was not proved by this study. The method of delivery also did not have the hypothesized effect on scores. However, the hypothesized interaction between feedback type and feedback delivery was shown, as was the hypothesis that higher self-efficacy would relate to higher test scores.

The primary difference between this study and previous findings (Daniels & Larson, 2001; Miller & West, 2010; Nesbit & Burton, 2006; Ilgen & Davis, 2000) is the lack of effect of positive or negative feedback on performance or self-efficacy. This

result may be due to the difference both between the first and second test given, and/or the score difference between forms; both of these differences may have contributed to the lack of significant effect. The difference between the first and second test given may be a result of fatigue for the participants, given the lower second score, but this finding may also indicate the lack of a practice effect confound, or at least that one is obscured by a larger effect of fatigue. A final possibility for the lack of change in self-efficacy is that it may be more of a long-term trait, one which is not susceptible to immediate feedback. Self-efficacy may have seen a change if more long-term or continuous feedback was provided.

The primary limitation of this study, as mentioned above, is the difference shown between both the first and second test, and the forms of the test. This effect could be rectified by administering the second test at a later time or date, as well as further work on a more equivalent first and second form for the test itself. In addition, this study primarily relies on subjective data provided by the participants; gaining more objective data for analysis such as current GPA, hours spent on the phone/text messages sent, and other information may prove useful for further studies. Future studies that look at the effect of electronic feedback on academic self-efficacy may want to further modify the academic self-efficacy scale to produce a higher reliability coefficient. In addition, a future study would likely need to utilize a larger number of participants, as the effects of feedback delivery may be too small to be seen with this study's number of participants, if such effects exist. Given that the reliability found for

the self-efficacy measure was at the lower level of the acceptable range, future research may also want to utilize a longer measure with a higher reliability score.

This study does provide an intriguing result in regards to the interaction between feedback type and delivery. While this result would need to be replicated in future studies, most importantly in studies using equivalent forms, it does show an important possibility. In essence, assuming that the person giving feedback wants to garner optimal performance, he or she should give positive feedback by voice and negative feedback by text, in order to maximize and minimize positive and deleterious effects, respectively. This obviously holds important consideration for research into the substitution of ICTs for practices such as supportive dialogues (Taylor, 2011). Future research on this effect could also look at the use of texting versus voicemail for clinical treatments, such as those used for smoking cessation (Haug, et al, 2009) schizophrenia (Pijnenborg, et al, 2007) and brain injury (Cully & Evans, 2010).

Future research could also take into account more demographic variables, such as gender or ethnicity, as well as using different measures of performance. The inclusion of gender is especially important given the possible gender divide that exists for ICTs (Joiner, Littleton, Chou, & Morahan-Martin, 2006). It could also be important to look at some of the factors for people that make them more or less likely to use texting or their cellular phone (Lu, Deng, & Weng, 2010; Reid & Reid, 2010; Reid & Reid, 2007; Jin & Park, 2010; Ling, 2010; Kim, Kim, Park, & Rice, 2007). Given the research on the texting language (Green, 2007; Perea, Acha, & Carreiras, 2009; Spagnolli & Gamberini, 2007), it

could be useful to see how providing feedback written in that manner may affect results.

It would also be important to look at other areas affected by performance feedback, such as goal orientation (VandeWalle, Cron, & Slocum, Jr., 2001), future effort investment (Venables & Fairclough, 2009), and some of the indirect effects that feedback can have (Tolli & Schmidt, 2008). There is a possibility that the lack of effect of performance feedback in this study was caused by another factor, such as participant goal (Cianci, Schaubroeck, & McGill, 2010), immediacy of feedback (Ho & Whitehill, 2009), or interpersonal dependency orientation (Bornstein, 2006).

REFERENCES

Assar, S., Amrani, R. E., & Watson, R. T. (2010). ICT and education: A critical role in human and social development. *Information Technology For Development*, *16*(3), 151-158.

Ayyagari, R., Grover, V., & Purvis, R. (2011). TECHNOSTRESS: TECHNOLOGICAL ANTECEDENTS AND IMPLICATIONS. *MIS Quarterly*, *35*(4), 831-858.

Bassi, M., Steca, P., Fave, A., & Caprara, G. (2007). Academic Self-Efficacy Beliefs and Quality of Experience in Learning. *Journal Of Youth & Adolescence*, *36*(3), 301-312.

Belschak, F. D., & Den Hartog, D. N. (2009). Consequences of Positive and Negative Feedback: The Impact on Emotions and Extra-Role Behaviors. *Applied Psychology: An International Review*, *58*(2), 274-303.

Bornstein, R. F. (2006). Self-schema priming and desire for test performance feedback: Further evaluation of a cognitive/interactional model of interpersonal dependency. *Self & Identity, 5*(2), 110-126.

Brady-Amoon, P., & Fuertes, J. N. (2011). Self-efficacy, self-rated abilities, adjustment, and academic performance. *Journal Of Counseling & Development*, *89*(4), 431-438.

Carroll, J. (2011). From Encyclopaedias to Search Engines: Technological Change and its Impact on Literacy Learning. *Australian Journal Of Language & Literacy*, *34*(2), 27-34.

Cavus, N., & Ibrahim, D. (2009). m-Learning: An experiment in using SMS to support learning new English language words. *British Journal Of Educational Technology*, *40*(1), 78-91.

Chemers, M. M., Hu, L., & Garcia, B. F. (2001). Academic self-efficacy and first year college student performance and adjustment. *Journal Of Educational Psychology*, *93*(1), 55-64.

Cianci, A. M., Schaubroeck, J. M., & McGill, G. A. (2010). Achievement of Goals, Feedback, and Task Performance. *Human Performance, 23*(2), 131-154.

Cook, S. E. (2004). NEW TECHNOLOGIES AND LANGUAGE CHANGE: Toward an Anthropology of Linguistic Frontiers. *Annual Review Of Anthropology*, *33*(1), 103-115.

Culley, C., & Evans, J. J. (2010). SMS text messaging as a means of increasing recall of therapy goals in brain injury rehabilitation: A single-blind within-subjects trial. *Neuropsychological Rehabilitation*, *20*(1), 103-119.

Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297-334.

Daniels, J. A., & Larson, L. M. (2001). The Impact of Performance Feedback on Counseling Self-Efficacy and Counselor Anxiety. *Counselor Education & Supervision*, *41*(2), 120-130.

Day, J. M., & Kumar, M. (2010). Using SMS text messaging to create individualized and interactive experiences in large classes: A beer game example. *Decision Sciences Journal Of Innovative Education*, *8*(1), 129-136.

Dermott, B. (2002). *501 synonym & antonym questions*. New York: LearningExpress.

Devellis, R. F. (1991). Scale development: theory and application. *Newbury Park: Sage Publications.*

Duijnhouwer, H., Prins, F. J., & Stokking, K. M. (2010). Progress feedback effects on students' writing mastery goal, self-efficacy beliefs, and performance. *Educational Research & Evaluation*, *16*(1), 53-74.

Elias, S. M., & MacDonald, S. (2007). Using Past Performance, Proxy Efficacy, and Academic Self-Efficacy to Predict College Performance. *Journal Of Applied Social Psychology*, *37*(11), 2518-2531.

Farrell, L., & Holkner, B. (2006). Making language work in hybrid workspaces: three tensions. *Studies In Continuing Education*, *28*(3), 305-320.

Fast, L. A., Lewis, J. L., Bryant, M. J., Bocian, K. A., Cardullo, R. A., Rettig, M., & Hammond, K. A. (2010). Does Math Self-Efficacy Mediate the Effect of the Perceived Classroom Environment on Standardized Math Test Performance?. *Journal Of Educational Psychology*, *102*(3), 729-740.

Gold, J., Lim, M. C., Hellard, M. E., Hocking, J. S., & Keogh, L. (2010). What's in a message? Delivering sexual health promotion to young people in Australia via text messaging. *BMC Public Health*, *10*792-802.

Green, J. (2007). Language: Intrtxtly. *Critical Quarterly, 49*(3), 124-128.

Harley, D., Winn, S., Pemberton, S., & Wilcox, P. (2007). Using texting to support students' transition to university. *Innovations In Education & Teaching International*, *44*(3), 229-241.

Haug, S., Meyer, C., Schorr, G., Bauer, S., & John, U. (2009). Continuous individual support of smoking cessation using text messaging: A pilot experimental study. *Nicotine & Tobacco Research*, *11*(8), 915-923.

Ho, D. L., & Whitehill, T. (2009). Clinical supervision of speech-language pathology students: Comparison of two models of feedback. *International Journal Of Speech-Language Pathology*, *11*(3), 244-255.

Hsieh, P., Sullivan, J. R., & Guerra, N. S. (2007). A Closer Look at College Students: Self-Efficacy and Goal Orientation. *Journal Of Advanced Academics*, *18*(3), 454-476.

Ilgen, D. R., & Davis, C. A. (2000). Bearing Bad News: Reactions to Negative Performance Feedback. *Applied Psychology: An International Review*, *49*(3), 550.

Jin, B., & Park, N. (2010). In-Person Contact Begets Calling and Texting: Interpersonal Motives for Cell Phone Use, Face-to-Face Interaction, and Loneliness. *Cyberpsychology, Behavior & Social Networking*, *13*(6), 611-618.

Joiner, R. R., Littleton, K. K., Chou, C. C., & Morahan-Martin, J. J. (2006). Gender and information communication technology. *Journal Of Computer Assisted Learning*, *22*(5), 317-319.

Karlsson, J., Liljeström, S., & Juslin, P. N. (2009). Teaching musical expression: effects of production and delivery of feedback by teacher vs. computer on rated feedback quality. *Music Education Research*, *11*(2), 175-191.

Kim, H., Kim, G., Park, H., & Rice, R. E. (2007). Configurations of relationships in different media: FtF, email, instant messenger, mobile phone, and SMS. *Journal of Computer-Mediated Communication, 12*(4), 1183-1207.

Lane, J., & Lane, A. (2001). SELF-EFFICACY AND ACADEMIC PERFORMANCE. *Social Behavior & Personality: An International Journal*, *29*(7), 687.

Lin, I., & Peper, E. (2009). Psychophysiological Patterns During Cell Phone Text Messaging: A Preliminary Study. *Applied Psychophysiology & Biofeedback*, *34*(1), 53-57.

Ling, R. (2010). Texting as a life phase medium. *Journal of Computer-Mediated Communication, 15*(2), 277-292.

Lu, M. M. (2008). Effectiveness of vocabulary learning via mobile phone. *Journal Of Computer Assisted Learning*, *24*(6), 515-525.

Lu, Y., Deng, Z., & Weng, B. (2010). Exploring factors affecting Chinese consumers' usage of short message service for personal communication. *Information Systems Journal, 20*(2), 183-208.

Martínez-Torres, M. R., Toral, S. L., Barrero, F. F., & Gallardo, S. S. (2007). Improving learning performance in laboratory instruction by means of SMS messaging. *Innovations In Education & Teaching International*, *44*(4), 409-422.

Miller, L., & West, R. L. (2010). The Effects of Age, Control Beliefs, and Feedback on Self-Regulation of Reading and Problem Solving. *Experimental Aging Research*, *36*(1), 40-63.

Nesbit, P. L., & Burton, S. (2006). Student justice perceptions following assignment feedback. *Assessment & Evaluation In Higher Education*, *31*(6), 655-670.

Pettigrew, J. (2009). Text Messaging and Connectedness Within Close Interpersonal Relationships. *Marriage & Family Review*, *45*(6-8), 697-716.

Perea, M., Acha, J., & Carreiras, M. (2009). Eye movements when reading text messaging (txt msgng). *Quarterly Journal of Experimental Psychology, 62*(8), 1560-1567.

Pijnenborg, G. M., Withaar, F. K., Evans, J. J., van den Bosch, R. J., & Brouwer, W. H. (2007). SMS text messages as a prosthetic aid in the cognitive rehabilitation of schizophrenia. *Rehabilitation Psychology*, *52*(2), 236-240.

Reedy, P., Luiselli, J. K., & Thibadeau, S. (2001). Improving staff performance in a residential child-care setting using computer-assisted feedback. *Child & Family Behavior Therapy*, *23*(1), 43-51.

Reid, D. J., & Reid, F. M. (2007). Text or Talk? Social Anxiety, Loneliness, and Divergent Preferences for Cell Phone Use. *Cyberpsychology & Behavior, 10*(3), 424-435.

Reid, F. M., & Reid, D. J. (2010). The expressive and conversational affordances of mobile messaging. *Behaviour & Information Technology, 29*(1), 3-22.

Rosenblum, L. D., Gordon, M. S., & Wuestefeld, A. (2000). Effects of Performance Feedback and Feedback Withdrawl on Auditory Looming Perception. *Ecological Psychology*, *12*(4), 273.

Sartori, R. (2010). Face validity in personality tests: psychometric instruments and projective techniques in comparison. *Quality & Quantity*, *44*(4), 749-759.

Sizoo, S., Jozkowskia, R., Malhotra, N., & Shapero, M. (2008). The Effects of Anxiety and Self-Efficacy on Finance Students. *Journal Of Instructional Psychology*, *35*(4), 347-356.

Spagnolli, A., & Gamberini, L. (2007). Interacting via SMS: Practices of social closeness and reciprocation. *British Journal Of Social Psychology*, *46*(2), 343-364.

Stone, E. F., & Stone, D. L. (1984). The effects of multiple sources of performance feedback and feedback favorability on self-perceived task competence and perceived feedback accuracy. *Journal Of Management*, *10*(3), 371-378.

Sweeny, S. M. (2010). Writing for the Instant Messaging and Text Messaging Generation: Using New Literacies to Support Writing Instruction. *Journal Of Adolescent & Adult Literacy*, *54*(2), 121-130.

Taylor, T., Hester, E., & Wilson, L. S. (2011). Video conferencing vs talking face-to-face: is video suitable for supportive dialogue?. *International Journal Of Therapy & Rehabilitation*, *18*(7), 392-403.

The Nielsen Company. (2010). *2010 media industry fact sheet*. Retrieved from http://blog.nielsen.com/nielsenwire/press/nielsen-fact-sheet-2010.pdf

Thijs, J., & Verkuyten, M. (2008). Peer Victimization and Academic Achievement in a Multiethnic Sample: The Role of Perceived Academic Self-Efficacy. *Journal Of Educational Psychology*, *100*(4), 754-764.

Tolli, A. P., & Schmidt, A. M. (2008). The role of feedback, casual attributions, and self-efficacy in goal revision. *Journal Of Applied Psychology*, *93*(3), 692-701.

Unsworth, L. (2008). Multiliteracies, E-literature and English Teaching. *Language & Education: An International Journal*, *22*(1), 62-75.

Vancouver, J. B., & Kendall, L. N. (2006). When self-efficacy negatively relates to motivation and performance in a learning context. *Journal Of Applied Psychology*, *91*(5), 1146-1153.

VandeWalle, D., Cron, W. L., & Slocum, J. r. (2001). The role of goal orientation following performance feedback. *Journal Of Applied Psychology*, *86*(4), 629-640.

Venables, L., & Fairclough, S. (2009). The influence of performance feedback on goal-setting and mental effort regulation. *Motivation & Emotion, 33*(1), 63-74.

Voss, K.E., Stem, D.E., Jr. & Fotopoulos, S. (2000). A comment on the relationship between coefficient alpha and scale characteristics. *Marking Letters*, 11(2), 177-191.

Walsh, M. (2010). Multimodal literacy: What does it mean for classroom practice?. *Australian Journal Of Language & Literacy*, *33*(3), 211-239.

APPENDIX A:

Script for Running Thesis

Research Procedure Scripts

Participant Check-in

Participants will be assigned an ID number and randomly assigned to a feedback type and delivery method group. Participants will also provide their cellular phone number, which will be stored in an electronic document on a USB drive along with the participant ID number and experimental group. Participants will then be sent a test text or voice message (the same type of delivery as their assigned group). Participants will be asked to have their cellular phones turned on and to not answer any phone calls or texts they receive during the session unless it is an emergency. Participants will be asked to at this time tell people if possible to not text or call them for the next hour.

Study Introduction

"This study is going to look at your performance on a measure of verbal ability. This measure is thought to reflect your performance potential in college. The average college student scores 75% on this measure. Your scores are going to be calculated electronically, and will then be given to you by a text message or voicemail. You will also be asked some questions about how you feel you will be able to perform in college, as well as how accurate you believe this measure is. Once everyone has completed this, I will leave the room to enter your scores. You will then receive your score by text message or voice message. This score will restate the average college student's score of 75%, followed by your percentage correct and a one-word descriptor of how you did. After your score is sent to you, you will then be given the second half of the measure, as well as a second set of questions about your thoughts on college performance and how accurate the measure is. After everyone has completed this measure, I will debrief all of you, answer questions, and we will be finished. I would like to ask all of you to please refrain from talking to each other or talking to anyone on your cell phones from now until the completion of this session. This session should last around one hour. I would like to tell you now that the message you receive on your phone during this session may incur a charge from your cellular provider. I will not be reimbursing you for any charges made to your cellular bill as a result of this message. You will only receive up to two messages from me as during this session, after which time my copy of your phone number will be erased. The system I am using to score your measures will not sell or disclose your phone number to any outside parties. If you are not comfortable with completing this study, you may discontinue it at this time and still receive credit."

First Half Instructions

"I'm going to give you a copy of the questions about your feelings on your ability to perform in college. Please fill out your ID number on your scantron in the name section. Please answer each question honestly in a way that reflects how you are feeling *at this moment*. Once you have completed the questions, raise your hand and I will come collect your sheet. If you have any questions, please raise your hand and I will speak to you individually."

Once all sheets have been collected

"I'm going to give you a copy of the actual measure now. Please fill out your ID number on your scantron in the name section. Please answer each question as accurately as you can. Please do not leave any answers blank; guess if you have to. Questions must be filled out in pencil. Please use one of the provided pencils if you do not have one. There are 20 questions for the actual measure, and the last page contains a question about how well you think this measure reflects your potential at this moment. Once you have completed every question, please raise your hand and I will come collect your sheets. If you have any questions, please raise your hand and I will speak to you individually. "

Scoring

Once all first-half measures have been collected

"I am going to leave the room to enter the scores into the computer. Someone else will stay in the room to make sure that there is no talking. This should take about five minutes, and once they have been entered, you will receive a voice or text message telling you your score. Whether you receive a voicemail or text message is randomly determined. Once you receive your message, please do not allow other people to see or hear your score. Do not tell your score to anyone else. If you do not receive a score, if you cannot hear your received message, or if your text message is distorted in some way, please let me know. I will take your ID number and attempt to have your score sent again. If there is another problem, you will move on without receiving your score. While I am out of the room, please do not talk to anyone else in this room or talk to anyone on your cell phone or text anyone. I will be gone for around five minutes."

Messages Sent:

Examiner leaves for five minutes and sends messages electronically

Positive Feedback: "You performed very well. You correctly answered 85% of questions on this measure. The average student correctly answers 75% of questions on this measure."

Negative Feedback "You performed very poorly. You correctly answered 65% of questions on this measure. The average student correctly answers 75% of questions on this measure."

Second Half Instructions

"I am now going to pass out the second half of the measure. Please fill out your ID number on your scantron in the name section. Please answer each question as accurately as you can. Please do not leave any answers blank; guess if you have to. Questions must be filled out in pencil. Please use one of the provided pencils if you do not have one. There are 20 questions for the actual measure, and the last page contains a question about how well you think this measure reflects your potential *at this moment*. Once you have completed every question, please raise your hand and I will come collect your sheets. If you have any questions, please raise your hand and I will speak to you individually."

Once all measures are completed

"I'm going to give you a second copy of the questions about your feelings on your ability to perform in college. Please fill out your ID number on your scantron in the name section. Please answer each question honestly in a way that reflects how you are feeling *at this moment*. Once you have completed the questions, raise your hand and I will come collect your sheet. If you have any questions, please raise your hand and I will speak to you individually."

APPENDIX B:

Verbal Measure Form 1

Antonym and Synonym Questions FORM 1

Read each question carefully and select the word that is most similar or dissimilar in meaning to the word provided. Do not skip any questions. Guess if you have to.

1) Delirious is most similar to
a. manic
b. calm
c. tasty
d. suspicious

2) Isolation is most similar to
a. fear
b. plentitude
c. solitude
d. disease

3) Outfit is most similar to
a. indoors
b. strong
c. special
d. furnish

4) Lure is most similar to
a. tickle
b. decoy
c. resist
d. suspect

5) Punctual is most dissimilar to
a. close
b. tardy
c. sloppy
d. precious

6) Cautious is most dissimilar to
a. reasonable
b. careful
c. illogical
d. reckless

7) Perilous is most dissimilar to
a. disciplined
b. similar
c. safe
d. honest

8) Infirm is most similar to
a. hospital
b. weak
c. short
d. fortitude

9) Lull is most similar to
a. pause
b. noise
c. boring
d. mark

10) Stingy is most dissimilar to
a. wasteful
b. democratic
c. spiteful
d. liberal

11) Impudent is most similar to
a. cautious
b. haphazard
c. gleeful
d. insolent

12) Malign is most similar to
a. evil
b. malicious
c. slander
d. grandiose

13) Lambaste is most similar to
a. marinade
b. commotion
c. censure
d. tickle

14) Tepid is most dissimilar to
a. dispassionate
b. scalding
c. crisp
d. clever

Read each question carefully and select the word that is most similar or dissimilar in meaning to the word provided. Do not skip any questions. Guess if you have to.

15) Solemnity is most similar to
a. lightheartedness
b. gravity
c. diligence
d. sleepiness

APPENDIX C:

Verbal Measure Form 2

Antonym and Synonym Questions FORM 2

Read each question carefully and select the word that is most similar or dissimilar in meaning to the word provided. Do not skip any questions. Guess if you have to.

1) Delude is most dissimilar to
a. drought
b. clever
c. enlighten
d. enrage

2) Omit is most similar to
a. recluse
b. neglect
c. mistake
d. destroy

3) Resilient is most dissimilar to
a. stubborn
b. careless
c. substantial
d. flimsy

4) Mutiny is most similar to
a. rebellion
b. currency
c. sailor
d. hassle

5) Naïve is most similar to
a. rural
b. secular
c. unsophisticated
d. sultry

6) Entice is most dissimilar to
a. piece
b. repulse
c. attract
d. repeat

7) Vacillate is most dissimilar to
a. decide
b. teeter
c. dilate
d. please

8) Kinetic is most dissimilar to
a. cold
b. static
c. lewd
d. foolish

9) Kowtow is most dissimilar to
a. snub
b. pull
c. fawn
d. forage

10) Rudimentary is most similar to
a. crass
b. gracious
c. deliberate
d. primitive

11) Pitched is most similar to
a. undone
b. retracted
c. heated
d. lovely

12) Largesse is most similar to
a. greatness
b. generosity
c. miniscule
d. clumsiness

13) Insidious is most dissimilar to
a. repellant
b. pure
c. charming
d. delicious

14) Decorum is most similar to
a. etiquette
b. merit
c. parliament
d. slipshod

Read each question carefully and select the word that is most similar or dissimilar in meaning to the word provided. Do not skip any questions. Guess if you have to.

15) Succor is most dissimilar to
a. genius
b. abet
c. injure
d. deciduous

APPENDIX D:

Face Validity Measures

Measure of Potential (FORM 1)

Please circle the number that applies to how strongly you agree or disagree with the following statements, *at this moment*.

1) I believe that this measure I am going to take reflects my potential to succeed in college.

1 Strongly Disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly Agree

Measure of Potential (Form 2)

Please circle the number that applies to how strongly you agree or disagree with the following statements, *at this moment*.

2) I believe that this measure that I took reflects my potential to succeed in college.

1 Strongly Disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly Agree

APPENDIX E:

Self-Efficacy Measure

Measure of Self-Views FORM 1 and 2

Please circle the number that applies to how strongly you agree or disagree with the following statements, *at this moment*.

1) I can cope with the intellectual demands of college.

1 Strongly Disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly Agree

2) I can make sufficient effort to meet the demands of college.

1 Strongly Disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly Agree

3) I can manage my time to meet the demands of college.

1 Strongly Disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly Agree

4) I will pass assignments/exams the first time – i.e. no retakes.

1 Strongly Disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly Agree

5) I will attain grades for the rest of this semester of between 90% to 100%.

1 Strongly Disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly Agree

6) I will attain grades for the rest of this semester of between 80% to 90%.

1 Strongly Disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly Agree

7) I will attain grades for the rest of this semester of between 70% to 80%.

1 Strongly Disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly Agree