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Dysfunctional Text Messaging as Related to Social Anxiety, Self-Esteem, Emotional Intelligence, and Attentional Control

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Dysfunctional Text Messaging as Related to Social Anxiety, Self-esteem, Emotional Intelligence, and Attentional Control

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Sean Nelson

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Abstract

Despite the widespread and increasing use and popularity of text messaging since the mid 1990's, the extent of the psychological literature regarding this technology is scarce. Chief amongst these underexplored areas is the relationship that text messaging, as a mode of Nonverbal Asynchronous Communication, has with Verbal Synchronous Communication abilities. For this study, these abilities have been operationalized as social anxiety, self-esteem, emotional intelligence, and attentional control. The available research implies a relationship between these concepts. Despite mostly theoretical links in the literature, no study had attempted to measure many of these relationships empirically. This study examined the relationship between text messaging, social anxiety, self-esteem, emotional intelligence, and attentional control, and explored the nature of these relationships. Participants responded to scales measuring self-perception of text message dependency, problem use of text messaging, and the variables operationalizing Verbal Synchronous Communication abilities. Results of the study show that many of these factors do correlate with dysfunctional text messaging. Implications of these findings, limitations of the study, and suggestions for future research are discussed.

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Dysfunctional text messaging as related to social anxiety, self-esteem, emotional intelligence, and attentional control

Text messaging, also called short message service messaging (SMS), has been an expanding component of world culture since the mid-1990's. In fact, it can be seen as one of the most ubiquitous forms of communication ever developed and a defining technology of our time (Campbell & Park, 2008). Texting is often seen as a necessary tool in day to day discourse. Although specific numbers are difficult to pinpoint and are subject to change, it was reported in 2011 that approximately 83% of American adults own cell phones, with 73% sending and receiving text messages at least occasionally (Smith, 2011). Young adults are far more likely to engage in text messaging than the general population, with 95% owning a cell phone, 97% of them using the text message feature, and with an average of 109.5 texts per day (Smith, 2011). In addition, a study conducted in 2008 revealed that university students spent 60 minutes per day text messaging (Ehrenberg, Juckes, White, & Walsh, 2008). The literature review that follows presents a case for the relationship between text messaging and levels of social anxiety, self-esteem, emotional intelligence, and attentional control. These concepts, and their relevance within text messaging literature, will be discussed.

Popular Research Regarding Text Messaging

Despite the pervasiveness and popularity of text messaging, especially with young people, research involving text messaging is surprisingly scarce. The majority of this literature involves the effects of text messaging on driving ability, text messaging as it

relates to writing ability and language, the effects of text messaging in the classroom, and text messaging as a means of electronically conducting therapy (Harrison, 2011; Hosking, Young, & Regan, 2009; Kemp, Wood, & Waldron, 2014; Drouin, 2011; Gingerich & Lineweaver, 2014; Wei, Wang, & Klausner, 2012; Joyce & Weibelzahl, 2011; Aguilera & Muñoz, 2011). Researchers have shown that people experience clear impairments in driving performance while text messaging (Drews, Yazdani, Godfrey, Cooper, & Strayer, 2009). Despite these impairments, and the inherent dangers involved with distracted driving, research has found that 91% of U.S. college students report using text messaging while driving (Harrison, 2011). Children who are poor readers typically spend more minutes per day on their phones compared to their more literate counterparts (Coe & Oakhill, 2011). Text messaging in the classroom is negatively correlated with students' grade point average (Junco, 2012). Finally, text messaging has been used as a tool in the treatment of psychological issues such as bulimia nervosa and substance use disorders (Shapiro, Bauer, Andrews, Pisetsky, Bulik-Sullivan, Hamer, & Bulik, 2010; Gonzales, Anglin, & Glik, 2014). Research into such topics is both pragmatic and informative. With the amount of texting that takes place in the United States, especially among young people, it is important to know how it impacts grades, literacy, and driving ability. However, there is a dearth of research into the more interpersonal effects of text messaging.

Measuring Dysfunctional Text Messaging

Research into text messaging is relatively new. Terms used to capture an unhealthy relationship with text messaging have included addiction, problem use,

pathological use, dependence, and compulsive use. Authors are often vague as to what these terms specifically entail, the interpretation of these terms is rarely uniform, and research into any one term is limited. Thus, we conceptualized an unhealthy relationship with text messaging with the blanket term of 'dysfunctional text messaging.' Dysfunctional text messaging refers to a habit of text messaging which impairs one's daily functioning or notably effects psychological well-being. Within the text messaging literature, there are three popular methods of determining dysfunctional use of text messaging. In the interests of accurately portraying the issue, the current study used two of these methods. The first popular method assesses the level of *dependence* that a person has regarding text messaging (Morrill, Jones, & Vaterlaus, 2013; Lu, Watanabe, Liu, Uji, Shono, & Kitamura, 2011). Although this concept of 'text message dependency' is not included in the widely used Diagnostic and Statistical Manual of Mental Disorders, the inclusion of gambling disorder leaves open the possibility of a similar diagnosis for media addictions such as text messaging. In the limited literature on the subject, text messaging dependence is largely viewed not as a disorder per se, but as a dependent tendency toward a particular behavior in relation to usage of the communication media (Igarashi, Motoyoshi, Takai, & Yoshida, 2008). This idea incorporates the notion that dependence is related to compulsive text messaging behavior. This behavior is often reinforced by the need to gain approval for intimate friends, although there are certainly other factors involved. The current study used a self-report measure of text messaging dependence called the Self-perception of Text-Message Dependency Scale to measure this construct. This measure assessed emotionally sensitive responsiveness to text messages, self-perception regarding compulsive use of text messages, and the level of

fear of disruption of relationships when without text messaging capabilities (Igarashi et al., 2008).

The second of these methods involves measurement of what has been called *problem use* of text messaging. This concept, even within the text messaging literature, is rarely studied. However, the concept of problem use is based on research assessing problem use of other forms of media such as mobile phones in general (Bianchi & Phillips, 2005) and internet-based media such as video games, and social networking websites (Ekinci, 2014). The conceptualization of problem use of text messaging lies in its use of a comparison of substance addictions to non-substance addictions. A large portion of this concept is based on Griffith's model of addiction, which is biopsychosocial in nature and includes six key factors: salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse (Griffiths, 2005; Rutland, Sheets, & Young, 2007).

The final frequently used method for assessing dysfunctional text messaging is through the use of questionnaires gathering data regarding the amount of texts one sends or receives during a set amount of time, the age at which one began using mobile phones or text messaging, the amount of time spent text messaging per day, and monthly fees associated with texting. This is often compared to the results of another questionnaire which measures text messaging dysfunction to provide supplementary information, but has also been used by itself (Lu, Katoh, Chen, Nagata, & Kitamura, 2014; Murdock, 2013). However, this was not used as a measure of dysfunctional text messaging, as there is no way to ascertain whether self-reports of text messaging frequency were reliable,

given the popularity, ease of use, and speed of the medium. In addition, text messaging volume is not necessarily indicative of dysfunctional use.

Face-to-Face Communication

There are two very different styles of communication at play when conceptualizing the state of contemporary communication. In this study, we introduce two concepts: Verbal Synchronous Communication and Nonverbal Asynchronous Communication. Verbal Synchronous Communication refers to communication in which one's voice is the primary instrument, and which is heavily dependent on turn-taking. Until very recently in human history, this was virtually the only effective means of communication. When using this term, this study is primarily referring to face-to-face communication and telephone communication, although other methods do exist. In contrast, Nonverbal Asynchronous Communication refers to communication in which there is no usage of voice whatsoever, and in which turn-taking is largely unimportant. When using this term, this study will focus on text messaging, although other methods, such as instant messaging and social media are quite popular as well.

It would seem as if popularity and accessibility of technologies such as text messaging have diminished the importance of Verbal Synchronized Communication skills to some degree in casual social discourse. People seem to, at least partially, meet their social needs without the need to speak to another person (Erwin, Turk, Heimberg, Fresco, & Hantula, 2004). However, in classrooms, most workplaces, in close romantic and social relationships, and child raising, Verbal Synchronized Communication skills remain of great importance. We can predict that a lack of these skills would make one

less likely to succeed in many life dimensions. In the 21st century, it seems that one must have an affinity for both forms of communication in order to effectively navigate the current communicative landscape.

The aim of this research endeavor was to determine if text messaging problem use and dependency affect competency in Verbal Synchronous Communication. Verbal Synchronous Communication is a complex concept, and can be measured in many different ways. For the purposes of this study, we conceptualized Verbal Synchronous Communication competency using four variables. These variables include levels of social anxiety, self-esteem, emotional intelligence, and attentional control. The rationale consists of the notion that each of these variables weighs heavily on one's ability to conduct Verbal Synchronous Communication. These variables are discussed below.

Social Anxiety

The concept of shyness has so much in common with social anxiety that the terms are often used interchangeably. Specifically, social anxiety is defined as "a state of anxiety resulting from the prospect or presence of interpersonal evaluation in real or imagined social settings" (Leary, 1983, p.67). In contrast to shyness, all instances of social anxiety can be characterized by concerns regarding how the individual is being evaluated and perceived by others (Leary & Schlenker, 1981). Social anxiety can also include symptoms such as a general uncomfortable feeling which influences one's ability to interact in social situations, and is often related to depressive symptoms (Pierce, 2009).

Human beings are usually motivated to achieve a sense of belonging. We feel the need to 'fit in' somewhere socially in life. In the past, much of the goal of 'fitting in'

required mostly face-to-face conversations to accomplish. The United States postal service got its start in the late 18th century, reducing the need to travel very long distances to communicate, while simultaneously serving as an alternative to face-to-face conversations. Technological advances in the early 20th century strengthened Verbal Synchronous Communication even further with the advent and popularity of the telephone. Not only did the telephone offer voice communication, which is something that letters could not, it was also cheaper, easier, and much, much faster to communicate in this way. The 21st century has brought many changes with it, but few are quite as powerful and defining as the widespread use and marked popularity of cellular telephones and text messaging. Cell phones served as an attractive alternative to face-to-face conversations, given that people could make phone calls anywhere at any time. Text messaging seems to have acted as a sort of synthesis of letters and telephones, bringing us almost full circle. Text messages retain the instant communication of telephones while sharing with letters that distinct lack of voice. In our new world, in which most Americans are 'plugged in' to media such as text messaging, Facebook, Twitter, and online gaming, Verbal Synchronous Communication is more easily circumvented than ever before.

As mentioned previously, people with high levels of social anxiety are anxious about how they will be evaluated and perceived by others in real or imagined social settings. In that light, it is no surprise that research suggests that people who are socially anxious use text-based communication over cell phones or computers to meet needs for interpersonal communication, while avoiding feared aspects of social situations (Erwin, 2004). High levels of social anxiety can be characterized not only by a fear of social

interactions but also of performance situations, behavioral avoidance of these situations, and physiological arousal such as trembling, sweating, and a racing heart (Aderka, McLean, Huppert, Davidson, & Foa, 2013).

The key here is that Verbal Synchronous Communication may provide a sort of 'training ground' for social skills. Verbal Synchronous Communication is multimodal in nature and uses quite a bit of nonverbal communication; speakers use tone and volume of voice, as well as facial and body gestures (Dohen, Schwartz, & Bailly, 2010). In addition to mutual attention and turn-taking, it also involves psychological, social, and affective aspects of interaction, and is greatly affected by the physical environment in which the exchange takes place (Dohen et. al., 2010). A general theme in the research into why people use text messaging services points to the idea that people appreciate the level of control that this medium gives them in interactions (Madell & Muncer, 2007). In addition, people tend to recognize the value of communication options such as text messaging when attempting to control situations which have the potential to threaten positive impressions of themselves (O'Sullivan, 2000).

In effect, research indicates that preference for text messaging is largely motivated by a desire for control. Text messaging allows us to communicate asynchronously, allowing the user to take as much time as they want to respond. The lack of visual and auditory cues, as well as a nonshared physical environment, allow for a greater degree of impression management, and makes deception easier. Individuals with a high degree of social anxiety may be inclined to use this sort of technology to control social situations, as it allows them to fulfill social needs without the standard interpersonal risks involved. In fact, one study revealed that high school students were

more likely to talk to people online or with text messaging when they had higher levels of social anxiety (Pierce, 2009). In addition, a questionnaire surveying people, mostly from the United Kingdom, found that socially anxious people tend to prefer texting to voice calls (Reid & Reid, 2007). However, a preference for controlling communication in the interest of interpersonal safety by people with high levels of social anxiety removes many opportunities to practice social skills. This may promote social skills deficits, which would likely increase anxiety regarding social situations, creating a vicious cycle. It should be noted, however, that one Malaysian study found that, without taking personality factors into consideration, social anxiety was not a significant predictor of text messaging frequency (Lee, Tam, & Chie, 2013). Although the subject has been touched upon, research between social anxiety and text messaging is greatly lacking, especially in the United States.

Self-Esteem

Self-esteem is often defined as "the positive or negative evaluations of the self, as in how we feel about it." (Smith & Mackie, 2007). Self-esteem is said to form fairly early in the course of human development, remaining fairly constant over time, and being resistant to change (Campbell, 1990). People with higher levels of self-esteem are typically able to resist manipulation, trust their own capacity for solving problems, and be sensitive to the needs and feelings of others (Hamachek, 1971). Conversely, people with low self-esteem can be characterized by an exaggerated fear of mistakes, marked self-criticism, perfectionism, pessimism, and envy (Gill, 1980). Simply put, one can conceptualize self-esteem largely by the concept of security. The lower self-esteem

becomes, the more insecure the individual is, and vice versa. In addition, research shows that levels of self-esteem correlate positively with levels of happiness (Baumeister, Campbell, Krueger, & Vohs, 2003).

Despite the importance of self-esteem in living a psychologically healthy and fulfilling life, the literature regarding the relationship between self-esteem and text messaging is practically nonexistent. One of the only articles touching upon the issue reported that people with low self-esteem prefer Instant Message communication to text messaging (Ehrenberg, et al., 2008). Another study revealed that people with low self-esteem tend to prefer e-mail communication more than people with high self-esteem, with this preference being reversed for face-to-face communication (Joinson, 2004). The author of that study also found a stronger preference for e-mail when there was a greater chance of interpersonal rejection. Although these are all communication tools which leave out verbal synchronous interactions, this tells us little about the relationship between text messaging and level of self-esteem.

The aforementioned need for control in conversations reflects an interpersonal approach which is self-protective, rather than self-enhancing. Individuals with lower self-esteem scores are typically less likely to take risks, to focus attention on themselves, and are more likely to focus on their own negative qualities (Baumeister, Tice, & Hutton, 1989). The same authors describe self-protection as corresponding to a fear of failure and a cautious, evasive approach to interpersonal interactions. In short, they are more likely to be self-protective, rather than self-enhancing. Indeed, research has shown that people with high self-esteem typically view negative feedback as a challenge, rather than a threat (Seery, Blascovich, Weisbuch, & Vick, 2004). It therefore comes as little surprise that

research has shown that low self-esteem is a risk factor for the development of social anxiety (Acarturk, Smit, de Graaf, van Straten, ten Have, & Cuijpers, 2009). Given the similarities in approaches to communication style, namely an emphasis on safety over healthy risk-taking, we should expect social anxiety and low self-esteem to be similarly related to text messaging.

Emotional Intelligence

Two components of personality that can be viewed as fundamental to the concept of personality itself include the cognitive and the emotional systems (Mayer & Salovey, 1995). Standards of intelligence usually refer to cognitive performance and little else. When these measurements of intelligence are applied to the evaluation of emotions, they tend to come up lacking. Salovey and Mayer (1990) were the first to use the term 'emotional intelligence,' and they conceptualized it as encompassing three categories of adaptive abilities: appraisal and expression of emotion, regulation of emotion, and utilization of emotions in solving problems. They defined the concept specifically as, "the capacity to reason about emotions, and of emotions to enhance thinking. It includes the abilities to accurately perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth" (Mayer & Salovey, 1997, p.5). The authors went on to create a revised model of emotional intelligence consisting of four branches of emotional intelligence; the first being perception, appraisal and expression of emotion, the second being emotional facilitation of thinking, the third being understanding, analyzing, and employing emotional knowledge, with the final branch

being the reflective regulation of emotions to further emotional and intellectual growth. These branches are associated with different stages of abilities, with individuals mastering these stages in sequential order.

This study used a self-report measure of emotional intelligence based on Salovey and Mayer's original 1990 model. The authors of this tool point out that while both the original and revised models are the most cohesive and comprehensive models of emotional intelligence, the original model is better equipped to conceptualize the various dimensions of one's current state of emotional development (Schutte, Malouff, Hall, Haggerty, Cooper, Golden, & Dornheim, 1998). As an added benefit, most of the dimensions of other models can be integrated into this earlier model as well.

Studies approaching the issue of the relationship between emotional intelligence and Nonverbal Asynchronous Communication are scarce, but present. In a study by Casale, Tella, & Fioravanti (2013) researchers found a negative relationship between emotional intelligence and internet addiction. They also found that the lower the level of assertiveness, self-reliance, and self-directedness, the higher the importance of controllability in social relationships. This idea of controllability is important to mention because it overlaps with the notion that people tend to prefer text messaging over face-to-face conversations or phone calls. In another study in Spain, researchers found that lower levels of emotional intelligence were related to maladaptive use of internet and mobile phones (Beranuy, Oberst, Carbonell, & Chamarro, 2009). The nature of the measurement of mobile phone abuse was such that no information regarding the specific role of text messaging could be gleaned from it, leaving the relationship between text messaging and emotional intelligence unknown. However, given that internet communication and text

messaging are both forms of Nonverbal Asynchronous Communication, and given that text messaging is a feature which is by definition incorporated into mobile phones, it would seem likely that emotional intelligence has a meaningful relationship with text messaging. Finally, another study found that levels of emotional intelligence positively predicted dysfunctional preoccupation, which the authors described as the problematic use of internet, computer gaming, video gaming, and gambling, in clinical and special needs samples (Parker, Summerfeldt, Taylor, Kloosterman, & Keefer, 2013). The general theme of these articles suggests that it is likely that emotional intelligence would be negatively correlated with dysfunctional text messaging. However, no study has yet analyzed this issue specifically.

Attentional Control

The final variable which influences one's ability to conduct Verbal Synchronous Communication is called attentional control. This term refers to one's ability to control attention voluntarily, and it is often considered to be a major function of executive processes (Derryberry & Reed, 2002). The term has also been conceptualized by the same authors as a sort of general capacity to control attention in relation to negative, as well as to positive reactions. Neuroimaging research incorporating attentional control scale scores uncovered activity in the rostral anterior cingulate and the dorsomedial prefrontal cortex, which reinforces the current conception of attentional control as associated primarily with anterior executive control areas of the brain (Derryberry & Reed, 2002; Mathews, Yiend, & Lawrence, 2004).

Measurement of attentional control has generally been divided into two broad categories: performance measures and self-report measures. Measurement of performance ability regarding attentional control is typically attempted with the Test of Variables of Attention, or T.O.V.A. test. This is a computerized test used to assess visual information processing skills and attention problems (Levine, Waite, & Bowman, 2013). Self-report measurement of attentional control is usually accomplished with a questionnaire called the attentional control scale, as this is the most popular and seemingly efficacious self-report scale.

The attentional control scale incorporates two major attentional control functions: focusing and shifting (Judah, Grant, Mills, & Lechner, 2014). These functions were uncovered when an analysis of the factor structure of the attentional control scale revealed these core constructs (Ólafsson, Smári, Guðmundsdóttir, Ólafsdóttir, Harðardóttir, & Einarsson, 2011). Attention focusing refers to one's ability to focus their attention when faced with distraction (Ólafsson et al., 2011). More specifically, it is defined as, "the capacity to intentionally hold the attentional focus on desired channels and thereby resist unintentional shifting to irrelevant or distracting channels" (Derryberry & Rothbart, 1988). This concept is easily conceptualized when one attempts to do things such as studying in a loud setting, driving a car with a particularly disruptive passenger on board, or trying to work while hungry. Attention shifting is defined as, "the capacity to intentionally shift the attentional focus to desired channels, thereby avoiding unintentional focusing on particular channels" (Derryberry & Rothbart, 1998). It refers to the flexible control of thought, and shifting or switching between different tasks (Ólafsson et al., 2011).

This study used a self-report measure of attentional control which measures voluntary attentional focusing and attentional shifting. One reason for selecting a self-report measure over the T.O.V.A. is for the sake of convenience. The self-report measure does not require permission and does not require special equipment. The only piece of research in the literature connecting the topic of attentional control with text messaging was a study by Levine et al. (2013) in which they used the T.O.V.A. to compare attentional control with text messaging frequency and time until response to text messages. In that sample, text messaging use was not correlated with the performance measure of attentional control. It appears that more research is needed regarding the link between performance measures of attentional control and text messaging. More importantly however, the relationship between dysfunctional text messaging and scores on the attentional control scale is yet to be assessed.

Text messaging allows us constant nonverbal asynchronous interaction with one another. Often times, this seems to come at the expense of attention to the world around us. Studies into the relationship between texting and driving, and texting and school performance shed light on the idea that texting and the idea of being connected at all times requires more attention of us than we can sometimes afford. In a study by Przybylski & Weinstein (2013), the authors conceptualized text messaging as providing a continual sense of connection to the wider social world which draws attention away from real-world events. In the study, two individuals would have a conversation. In one condition, there would be a cell phone in the room. This cell phone was not owned by either party, and it was always turned off. The participants in this condition reported lower relationship quality and less closeness with their partners after the interaction than

participants in the other condition in which no cell phone was present. These findings imply the taxing of attentional resources due to the mere presence of a cell phone, which hindered the ability of participants to give the verbal synchronous conversation the attention that would be optimal. Given the sheer amount of time that most individuals spend around cell phones each day, not to mention the frequency of texting discussed earlier, it would seem as if the effect of the medium on face-to-face interactions has been significant.

Attentional control is linked to emotional intelligence in the sense that major theoretical views on the subject propose that individuals with lower levels of executive attention control are poor at regulating emotions (Derryberry & Rothbart, 1988; Eysenck, Derakshan, Santos, & Calvo, 2007). In a Polish study, Fajkowska & Derryberry (2010) found strong, systemic relationships between attentional control and measures of arousal, temperament, motivation, and emotionality. They also mentioned that good attentional control may protect individuals from emotional disorders by regulating conceptual, perceptual, and response processing. Thus, attentional control is relevant to the study of anxiety as well. Research has shown that lower scores on attentional focusing, indicating a poorer ability to focus attention and resist distraction, are associated with higher levels of anxiety (Reinholdt-Dunne, Mogg, & Bradley, 2013; Ólafsson et al., 2011). As an added note, these same studies also found that lower scores on attentional shifting predicted higher depression scores.

Present study

We operationalized Verbal Synchronous Communication skills as consisting primarily of varying levels of social anxiety, self-esteem, emotional intelligence, and attentional control. It is evident that research into the relationship between text messaging and any of these four factors ranges from between insufficient to nonexistent. The effects of text messaging on many facets of human psychology are scarcely explored, if at all. Though still a young field of research, the emphasis on text messaging as it relates to the classroom, driving, reading, and writing ability, has limited many other meaningful avenues of exploration. Given the current thorough assimilation of Nonverbal Asynchronous Communication into our daily lives, and the fact that Verbal Synchronous Communication is still essential, research into the relationship between the two is of great importance.

Of interest in this study was the extent to which dysfunctional text messaging is correlated with self-reported social anxiety, self-esteem, emotional intelligence, and attentional control, with which we have operationalized Verbal Synchronous Communication ability. The relationship between dysfunctional text messaging and social anxiety is empirically underexplored. In contrast, the relationship between dysfunctional text messaging and self-esteem, emotional intelligence, and attentional control appears to be empirically unexplored. The present study investigated the possibility that dysfunctional text messaging results in deficits in Verbal Synchronous Communication skills, conceptualized as face-to-face or telephone conversations.

Based on previous findings, it was hypothesized that levels of dysfunctional text messaging would be positively correlated with levels of social anxiety (Hypothesis 1).

Conversely, it was also hypothesized that levels of dysfunctional text messaging would be negatively correlated with levels of self-esteem (Hypothesis 2), emotional intelligence (Hypothesis 3), and attentional control (Hypothesis 4).

Method

Participants

Participants consisted entirely of undergraduate students from Eastern Illinois University enrolled in an Introduction to Psychology course. A total of 184 participants were recruited for this study, all of whom received course credit for their participation. There were two criteria for the removal of participants' data. The first criterion was completing the study in less than eight minutes, an amount of time considered too short to adequately comprehend and honestly answer the entirety of the questions. The second criterion consisted of individuals who did not answer all of the questions in the study. Thirty-seven participants were excluded from this study for one, or both, of these reasons. Thus, this left a final sample of 147 participants.

This remaining sample consisted of 36 males (24.4%) and 111 females (75.6%). This sample also consisted of 106 (72.1%) participants who were White/Caucasian, 27 (18.4%) participants who were Black/African-American, 8 (5.4%) participants who were Hispanic/Latino, 4 (2.7%) participants who were Asian, and 2 (1.4%) participants who identified themselves as American Indian or Alaska Natives.

Procedure

Participants were recruited through the SONA system. After signing an informed consent form, the participants were given questionnaires to complete in the psychology laboratory of the physical sciences building at EIU via computers running Qualtrics. Credit was awarded to students through the SONA system.

Measures

Self-perception of Text-Message Dependency Scale (STDS). The STDS is a 15-item self-report questionnaire designed to measure the way in which participants perceive their use of text messaging, along with their attitudes toward compulsive use of text messages in the context of interpersonal relationships (Igarashi et al., 2008). It is a short version of the original 40-item self-perception of text-message dependency scale (Igarashi, Motoyoshi, Takai, & Yoshida, 2005). Participants are asked to rate each item on a 5-point scale, which ranges from a score of 1 (*strongly disagree*) through a score of 5 (*strongly agree*). The highest possible score is 75, with the lowest being 15. Studies such as Lu et al. (2014) simply state that higher scores on the measure indicate greater dependency on text messaging.

This scale includes three subscales composed of five items each. The first, the Emotional Reaction Subscale, measures sensitive responses to text messages (e.g., "I feel anxious when people don't immediately reply to my text message"). The Perception of Excessive Use Subscale is described as measuring self-perception about compulsive use of text messages (e.g., "I use text messages even while I am talking with friends"). The final subscale, the Relationship Maintenance Subscale, consists of items which are

related to the fear of disruption of relationships without text messages (e.g., "I think my relationships would fall apart without text messages"). Factor analysis by Igarashi (2008) found that factors in the short-version scale corresponded to those in the original scale; they found Cronbach's alphas consisting of .85 to .78, whereas a study by Lu et al. (2011) found alphas consisting of .91 to .90, indicating good internal consistencies of each factor of the STDS. Test-retest reliability analysis over a five month time period by Lu et al. (2014) reveals fair correlational values for Emotional Reaction and Excessive Use subscale scores, at between .70 and .51 and between .75 and .49, respectively, and poor correlational values for Relationship Maintenance subscale scores, at between .29 and .58. Given the lack of tools to assess the problem of dysfunctional text messaging, and the fact that this is the tool most used in the literature by far, this can be seen as acceptable for the time being.

SMS Problem Use Diagnostic Questionnaire (SMS-PUDQ). The SMS-PUDQ is an 8-item self-report questionnaire developed by Rutland et al. (2007) used to assess behaviors indicative of text messaging addiction. Participants are asked the extent to which each item describes them on a Likert scale from 1 (*very inaccurate*) to 5 (*very accurate*). In this case, higher scores are associated with higher levels of addiction. It consists of eight items adapted from a measure of problematic internet use by Young (2004) for use with text messaging. The measure is based on Griffiths' model of addiction, which consists of six key factors present in all addictions: salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse (Griffiths, 2005). Salience is defined in this context as when the relevant activity becomes the most

important activity in the person's life and dominates their thinking, feelings, and behavior. The survey is divided into two levels of dysfunction: Pathological Use and Problem Use, with Problem Use being less severe. Items in the Pathological Use subscale produced an alpha of .84, whereas items in the Problem Use subscale produced an alpha of .87, showing good internal consistency. Although a high total score on the SMS-PUDQ may be indicative of problem use, scores derived on these two components can be further employed as subscales to assess a relative level of pathology (Rutland et al., 2007). Pathological Use contains items which assess relapse (e.g., "I have repeatedly made unsuccessful efforts to control, cutback, or stop text messaging use"), mood modification (e.g., "I use text messaging as a way of escaping from problems or of relieving a bad mood [e.g., feelings of helplessness, guilt, anxiety, depression]"), withdrawal (e.g., "I feel restless, moody, depressed, or irritable when attempting to cut down or stop text messaging use"), and two items that measure interpersonal conflict (e.g., "I have jeopardized or risked the loss of a significant relationship, job, educational, or career opportunity because of using text messaging"; "I have lied to family members, therapists, or others to conceal the extent of involvement with text messaging"). Problem Use consists of two items describing salience (e.g., "I feel preoccupied with using text messaging [I think about previous text messaging activity or anticipate next opportunity to use text messaging]"; "I use text messaging longer than originally intended"), one that focuses on preoccupation with text messaging use, one that focuses on compulsivity of text messaging use. It also contains an item describing tolerance (e.g., "I feel the need to use text messaging with increasing amounts of time to achieve satisfaction"). In a study by Buckner, Castille, & Sheets (2012), they replaced every instance of the term 'SMS'

with 'text messaging'. Due to the antiquated status of the term 'SMS', this seems to be the best course of action, and the same action was performed in this study.

Demographic Information. This survey was constructed for the purposes of this study and includes a series of questions meant to gather background information regarding the participant and their text messaging behaviors. Questions include age, gender, race, how long the participant has been text messaging, estimated number of text messages sent per day and week, estimated number of text messages received per day and week, estimated amount of time spent engaged in texting per day and week, and classroom text messaging frequency.

Social Anxiety Questionnaire for Adults (SAQ-A30). The SAQ-A30 is a 30-item self-report questionnaire which was developed to measure specific and general social anxiety symptoms in adults from clinical and non-clinical populations (Caballo, Salazar, Arias, Irurtia, & Calderero, 2010). Participants are given scenarios and are asked about the level of unease, stress, or nervousness they would exhibit on a Likert-type scale from 1 (*not at all or very slight*) to 5 (*very high or extremely high*). Total scores lie between 30 and 150. Higher scores on this inventory reflect higher levels of social anxiousness. Recommended cut-off scores for general anxiety are different between genders, due to the mean being higher for women. The recommended cut-off score for social phobia in males is 92, with the recommended score being 97 for females. The questionnaire contains five factors with six questions per factor. These factors include Speaking in Public and Talking With People in Authority (e.g., "Having to speak in class,

at work, or in a meeting"); Interactions With The Opposite Sex (e.g., "asking someone I find attractive to dance"); Assertive Expression of Annoyance, Disgust, or Displeasure (e.g., "having to ask a neighbor to stop making noise"); Criticism and Embarrassment (e.g., "making a mistake in front of other people"); and Interactions With Strangers (e.g., "maintaining a conversation with someone I've just met"). Cronbach's alphas for these factors lie between .86 and .78, with the total measure resulting in a value of .93, showing good internal consistency (Caballo, Salazar, Irurtia, Arias, & Hoffman, 2012).

Rosenberg Self-Esteem Scale. The Rosenberg Self-Esteem Scale is a 10-item self-report inventory designed to measure global self-worth by assessing positive and negative feelings regarding the self. Its history can be traced back as far as 1965, and it is a widely used instrument for measuring self-esteem even today (Rosenberg, 1965; Joinson, 2004). Items are answered on a 4-point Likert-type scale format ranging from strongly agree to strongly disagree, with higher scores indicating a higher level of self-esteem. Researchers testing reliability among six assessments found test-retest reliability through the Heise procedure to be .88, indicating good reliability (Robins, Hendin , & Trzesniewski, 2001). In addition, factor analysis of the items point to a single general factor, signifying this scale as a uni-dimensional assessment of self-esteem (Gray-Little, Williams, & Hancock, 1997).

Emotional Intelligence Scale (EIS). The EIS is a 33-item self-report questionnaire, based on the Salovey and Mayer (1990) conceptualization of emotional intelligence which was described above (Schutte et al., 1998). The measure uses a 5-point

scale, ranging from a score of 1 (*strongly disagree*) to a score of 5 (*strongly agree*). The total range of possible scores lies between 33 and 165, with a higher score indicating a higher level of emotional intelligence, and vice versa. An underlying factor structure was reported by the authors of this tool. These three factors include the individual's perception of the extent to which they can appraise, express and regulate emotions in themselves and others, and use emotions in solving problems. Test-retest reliability with 28 students after a two week interval was acceptable at .78. Schutte et al. (1998) reported Cronbach's alphas ranging from .90 to .87, which is indicative of good internal consistency. Lastly, despite previous claims that measures of emotional intelligence are confounded by personality factors and cognitive abilities; the EIS was found to be distinct from personality measures and cognitive ability as not to make it redundant with those constructs, according to the authors. It should be noted that scores on the EIS were significantly correlated with the personality dimension of openness to experience, but it was not so highly correlated as to be redundant (Schutte et al., 1998). Indeed, one would intuitively expect an emotionally intelligent person to be open to new experiences.

Attentional Control Scale (ACS). The ACS is a 20-item self-report questionnaire used to assess executive control of attention. It was developed by Derryberry & Reed in 2001 to measure the two most relevant factors in the assessment of voluntary attentional control: attentional focusing and attentional shifting. These terms were discussed in greater detail earlier in the literature review. Participants are asked to indicate the degree to which the statement is characteristic or true of them, and items are scored on a 4-point Likert-type scale format ranging from 1 (*almost never*) to 4 (*always*),

with higher scores indicating a higher level of attentional control. The internal consistency of the total ACS was reported by Ólafsson et al. (2011) to have a Cronbach's alpha of .84, while the Focusing factor was indicated to be at .82. These show good internal consistency, while the Shifting factor showed reasonable consistency at .68. A Polish study found that the test-retest reliability of the items comprising the ACS after one month were moderate, with test-retest coefficients from .45 to .73 per item, with a total score of .61 for the entirety of the ACS (Fajkowska & Derryberry, 2010). Due to item 9 having no significant correlations with other items, and based on Ólafsson's recommendation to do so, item 9 did not count toward the overall score in this study. This leaves 19 items which combine to form the final score, leaving the range of possible scores between 19 and 76.

Results

Internal Consistency and General Results Regarding Scales

After reverse scoring negatively worded items from each of the scales, an analysis of internal consistency was conducted on each scale and subscale. Cronbach's alphas for each measure are displayed below in Table 1.

Table 1

Internal Consistency of the Measures (N = 147)

Measure	Cronbach's Alpha
STDS	.83
STDS Emotional Reaction	.76

STDS Perception of Excessive Use	.81
STDS Relationship Maintenance	.73
SMS-PUDQ	.78
SMS-PUDQ Pathological Use	.76
SMS-PUDQ Problem Use	.63
SAQ-A30	.92
SAQ-A30 Speaking in Public / Authority	.84
SAQ-A30 Interactions with the Opposite Sex	.84
SAQ-A30 Assertive Expression	.78
SAQ-A30 Criticism and Embarrassment	.76
SAQ-A30 Interactions with Strangers	.76
Rosenberg Self-esteem Scale	.88
Emotional Intelligence Scale	.87
Attentional Control Scale	.81
Attentional Control Scale: Focusing	.81
Attentional Control Scale: Shifting	.51

The alphas for the measures were generally consistent with results from the literature. A notable exception includes the SMS-PUDQ Problem Use subscale, which exhibited a much lower alpha than reported in its original research (Griffiths, 2005). In addition, the Attentional Control: Shifting subscale, reported with an alpha of .68 in the literature, exhibited a lower .51 alpha in this study (Ólafsson et al., 2011). In addition, the means and standard deviations of the scales and subscales are displayed below in Table 2.

Table 2

Means and Standard Deviations of the Measures (N = 147)

Measure	*M*	*SD*	Possible Range of Scores
STDS	48.20	7.99	15 - 75
STDS Emotional Reaction	16.70	3.51	5 - 25
STDS Perception of Excessive Use	19.44	3.61	5 - 25
STDS Relationship Maintenance	12.07	3.51	5 - 25
SMS-PUDQ	17.78	5.51	8 - 40
SMS-PUDQ Pathological Use	9.52	3.98	5 - 25
SMS-PUDQ Problem Use	8.25	2.47	3 - 15
SAQ-A30	87.84	18.69	30 - 150
SAQ-A30 Speaking in Public / Authority	18.22	5.24	6 - 30
SAQ-A30 Interactions with the Opposite Sex	18.39	4.93	6 - 30
SAQ-A30 Assertive Expression	16.90	4.67	6 - 30
SAQ-A30 Criticism and Embarrassment	18.97	4.40	6 - 30
SAQ-A30 Interactions with Strangers	15.36	4.39	6 - 30
Rosenberg Self-esteem Scale	29.49	5.18	10 - 40
Emotional Intelligence Scale	123.69	12.57	33 - 165

Attentional Control Scale	47.05	7.41	19 - 76
Attentional Control Scale: Focusing	21.79	4.85	9 - 36
Attentional Control Scale: Shifting	25.26	3.68	10 - 40

Correlations

Pearson correlations were the major analyses used in this study. That being said, correlations between the many factors presented were conducted. The different variables exhibited widely different relationships with one another. See Table 3 below.

Table 3

Correlations Between Measures (N = 147)

Variable	1	2	3	4	5	6
1: STDS	-					
2: STDS Emotional Reaction	+	-				
3: STDS PEU	+	.350***	-			
4: STDS RM	+	.450***	.241**	-		
5: SMS-PUDQ	.573***	.476***	.358***	.460***	-	
6: SMS-PUDQ Pathological Use	.413***	.349***	.190*	.395***	+	-
7: SMS-PUDQ Problem Use	.613***	.499***	.492***	.390***	+	.914***

8: SAQ-A30	.194*	.232**	-.016	.225**	.177*	.140
9: SAQ-A30 Authority	.208*	.168*	.074	.230**	.179*	.135
10: SAQ-A30 Opposite Sex	.205*	.244**	.014	.208*	.203*	.190*
11: SAQ-A30 Assertiveness	.105	.147	-.014	.106	.025	-.007
12: SAQ-A30 Criticism	.129	.240**	-.057	.111	.141	.069
13: SAQ-A30 Strangers	.106	.118	-.100	.225**	.143	.159
14: Rosenberg Self-Esteem Scale	-.246**	-.308***	-.023	-.227**	-.348***	-.327***
15: Emotional Intelligence Scale	.057	-.047	.222**	-.052	-.131	-.218**
16: Attentional Control Scale	-.209*	-.100	-.131	-.241**	-.209*	-.161
17: ACS Focusing	-.299***	-.186*	-.203*	-.285***	-.241**	-.183*
18: ACS Shifting	-.029	.044	.002	-.111	-.104	-.084
19: Frequency of class texting	.394***	.364***	.366***	.157	.260***	.182*

*** $p < .001$, ** $p < .01$, * $p < .05$, + indicates a correlational relationship which could not be calculated due to shared items.

Variable	7	8	9	10	11	12
7: SMS-PUDQ Problem Use	-					
8: SAQ-A30	.169*	-				
9: SAQ-A30 Authority	.181*	+	-			
10: SAQ-A30 Opposite Sex	.146	+	.588***	-		
11: SAQ-A30 Assertiveness	.067	+	.475***	.474***	-	
12: SAQ-A30 Criticism	.203*	+	.544***	.485***	.559***	-
13: SAQ-A30 Strangers	.063	+	.601***	.632***	.506***	.439***
14: Rosenberg Self-Esteem Scale	-.249**	-.449***	-.386***	-.285***	-.359***	-.462***
15: Emotional Intelligence Scale	.059	-.138	-.163*	-.073	-.080	-.078
16: Attentional Control Scale	-.206*	-.334***	-.380***	-.149	-.299***	-.242**
17: ACS Focusing	-.242**	-.330***	-.373***	-.154	-.321***	-.249**
18: ACS Shifting	-.096	-.238**	-.273***	-.097	-.180*	-.160
19: Frequency of class texting	.287***	.025	.100	.004	-.036	.092

*** $p < .001$, ** $p < .01$, * $p < .05$, + indicates a correlational relationship which could not be calculated due to shared items.

Variable	13	14	15	16	17	18
13: SAQ-A30 Strangers	-					
14: Rosenberg Self-Esteem Scale	-.284***	-				
15: Emotional Intelligence Scale	-.148	.469***	-			
16: Attentional Control Scale	-.243**	.374***	.322***	-		
17: ACS Focusing	-.197*	.382***	.208*	+	-	
18: ACS Shifting	-.229**	.251**	.374***	+	.502***	-
19: Frequency of class texting	-.072	.065	.143	-.141	-.179*	-.047

*** $p < .001$, ** $p < .01$, * $p < .05$, + indicates a correlational relationship which could not be calculated due to shared items.

Hypothesis 1 predicted that levels of dysfunctional text messaging would be positively correlated with levels of social anxiety. A correlational analysis showed that there was a significant positive relationship between self-perception of text message dependency and social anxiety ($r = .19, p = .02$). There was also a significant positive correlation between problem use of text messaging and social anxiety ($r = .18, p = .03$). However, after multiple regression analyses were performed, social anxiety was no longer significant with either self-perception of text message dependency or problem use of text messaging.

Hypothesis 2 predicted that levels of dysfunctional text messaging would be negatively correlated with levels of self-esteem. A correlational analysis uncovered a significant negative relationship between self-perception of text message dependency and self-esteem ($r = -.25$, $p = .003$). In addition, there was also a significant negative relationship between problem use of text messaging and self-esteem ($r = -.35$, $p < .001$). After multiple regression analyses were performed, a significant negative relationship was retained between both self-perception of text message dependency and self-esteem and between problem use of text messaging and self-esteem.

In hypothesis 3, the expectation was that levels of dysfunctional text messaging would be negatively correlated with levels of emotional intelligence. A correlational analysis was performed which resulted in a non-significant relationship between self-perception of text message dependency and emotional intelligence ($r = .06$, $p = .49$). Also, a non-significant relationship between problem use of text messaging and emotional intelligence ($r = -.13$, $p = .11$) was found. However, after performing multiple regression analyses, a significant and positive relationship emerged between self-perception of text message dependency and emotional intelligence. A non-significant relationship between problem use of text messaging and emotional intelligence was retained.

Finally, hypothesis 4 consisted of the expectation that levels of dysfunctional text messaging would be negatively correlated with levels of attentional control. The correlational analysis performed showed a statistically significant, negative correlation between self-perception of text message dependency and attentional control ($r = -.21$, $p = .01$). In addition, a statistically significant, negative correlation between problem use of

text messaging and attentional control (r = -.21, p = .01) was also uncovered. Given the nature of the attentional control construct, namely, the marked differences between attentional focusing and attentional shifting, correlational analyses were also performed on focusing and shifting separately. Attentional focusing was significantly negatively correlated with self-perception of text message dependency (r = -.30, p < .001). Also, it was significantly negatively correlated with problem use of text messaging (r = -.24, p = .003). However, attentional shifting did not evince significant relationships with either self-perception of text message dependency (r = -.03, p = .73) or problem use of text messaging (r = -.10, p = .21). After performing multiple regression analyses, a negative correlation between self-perception of text message dependency and attentional control approached significance, and a non-significant relationship between problem use of text messaging and attentional control was found.

It should also be noted that the Self-perception of Text-Message Dependency Scale (STDS) and the SMS Problem Use Diagnostic Questionnaire (SMS-PUDQ) were significantly positively correlated with one another (r = .57, p < .001). Another observation consisted of the finding that the question indicating the frequency with which people use text messaging in classrooms was significantly positively correlated with STDS scores (r = .39, p < .001) and SMS-PUDQ scores (r = .26, p = .001), and negatively correlated with Attentional Control Focusing (r = -.18, p = .03).

Multiple Regressions and Miscellaneous Data

In addition to correlations, a multiple regression analysis was conducted to examine how the following psychological traits predicted text message dependence:

social anxiety, self-esteem, emotional intelligence, and attentional control. Results show that this set of predictors accounted for 12.7% of the variance in text message dependency, $F(4,142) = 5.167$, $p = .001$. Self-esteem accounted for most of the variance in text messaging dependence (8%), $p = .006$. Emotional intelligence also contributed significantly to the variance (6%), $p = .007$. Attentional control approached significance, and accounted for some of the variance (3%), $p = .056$. Thus, the lower one's self-esteem and attentional control, and the higher their emotional intelligence, the more likely they are to endorse text messaging dependence. A summary of the results of the multiple regression analysis is found below in Table 4.

Table 4

Summary of Multiple Regression Analysis for Variables Predicting Text Messaging Dependence (N = 147)

Variable	*B*	*SE B*	*β*
Social Anxiety	.020	.039	.047
Self-esteem	-.428	.154	-.278*
Emotional Intelligence	.158	.058	.248*
Attentional Control	-.183	.095	-.170

Note. $R^2 = .127$; *adjusted* $R^2 = .102$

* $p < .05$

Another multiple regression analysis was conducted in order to examine how these four aforementioned traits predicted problem use of text messaging. In this model, the results showed that this set of predictors accounted for 13.1% of the variance in problem use of text messaging, $F(4,142) = 5.355$, $p < .001$. Self-esteem was the only psychological trait which contributed significantly to the variance (11.5%), p = .001. Thus, lower self-esteem leads to people being more likely to endorse problem use of text messaging. A summary of the results of the multiple regression analysis is found below in Table 5.

Table 5

Summary of Multiple Regression Analysis for Variables Predicting Problem Use of Text Messaging (N = 147)

Variable	*B*	*SE B*	*β*
Social Anxiety	.000	.027	-.001
Self-esteem	-.360	.106	-.339*
Emotional Intelligence	.027	.040	.061
Attentional Control	-.076	.065	-.102

Note. $R^2 = .131$; *adjusted* $R^2 = .107$

* $p < .05$

Responses to the demographics questions were varied and worthy of note. When asked when they first began text messaging, participants reported a range from between five years old and eighteen years old. In other words, all participants reported having used text messaging by 18 or younger. Participants were also asked about frequency of text messaging use, but the data was so inconsistent that it is not useful in this study. Participants were asked how frequently they use text messaging in class, and the responses to this inquiry are available below in Table 6.

Table 6

Frequency of Text Messaging in Class ($N = 147$)

Categories	Frequency	Percentage (%)
Never	14	9.5
Rarely	28	19.1
Sometimes	51	34.7
Often	40	27.2
All of the time	14	9.5

T-tests for independent means comparing males and females were conducted on social anxiety and self-esteem. At an alpha level of .05, results show that females ($M = 90.79$, $SD = 18.74$) exhibited higher levels of social anxiety than did males ($M = 78.75$, $SD = 15.52$), $t(145) = -3.49$, $p = .001$ (two-tailed). In addition, results show that, at an alpha level of .05, females ($M = 28.69$, $SD = 5.19$) exhibited lower levels of self-esteem than did males ($M = 31.94$, $SD = 4.39$), $t(145) = 3.38$, $p = .001$ (two-tailed).

Discussion

This paper examined the relationship between dysfunctional text messaging (as measured by text messaging dependence and problem use of text messaging), social anxiety, self-esteem, emotional intelligence, and attentional control. Both correlational analyses and multiple regression analyses were conducted in order to examine the relationships between these various factors. T-tests were also used to examine the data. The discussion that follows is based on the findings of these analyses.

Text Messaging and Social Anxiety

It was predicted that dysfunctional text messaging and social anxiety would be correlated positively. In other words, the stronger the level of social anxiety, the more likely one is to exhibit an unhealthy relationship with text messaging. As mentioned previously, a good deal of the rationale behind this prediction was the finding that people with higher social anxiety tend to avoid feared aspects of social situations and that text messaging is an effective way of controlling the level of interpersonal risk involved with a conversation (Erwin, 2004). Results from this study further supported this relationship. Positive correlations were obtained between social anxiety scores and both self-perception of text message dependency and text messaging problem use scores.

As discussed earlier, Verbal Synchronous Communication is a multimodal form of discourse which uses tools such as facial and body gestures, and the physical environment. Thus, this finding has significant implications. If people are using text messaging to avoid social anxiety, text messaging could be seen as a dysfunctional coping mechanism. A lack of practice of key social skills through excessive text

messaging could potentially increase or maintain social anxiety, given that there are less opportunities for desensitization and reality testing of feared scenarios.

It should be noted that multiple regression analyses indicated that social anxiety did not contribute a significant amount of variance to the model with either self-perception of text messaging dependence or problem use of text messaging. The lack of variance that social anxiety accounts for was a surprising finding. This suggests that, when attempting to address dysfunctional text messaging, other avenues of explanation may be more fruitful. It is important to point out that much more research needs to be conducted regarding the nature of dysfunctional text messaging and the complex relationship that it might have with social anxiety before many interventions will be empirically tenable.

Text Messaging and Self-esteem

It was predicted that dysfunctional text messaging and self-esteem would be correlated negatively. To put that another way, the higher the level of one's dysfunctional relationship with text messaging, the lower one's self-esteem. The correlational results of this study further supported this relationship. Significant negative correlations were obtained between self-esteem scores and both self-perception of text message dependency and text messaging problem use scores. People with higher levels of self-esteem are typically able to resist manipulation, trust their own capacity for solving problems, and be sensitive to the needs and feelings of others (Hamachek, 1971). People lower in self-esteem often exhibit an exaggerated fear of mistakes, marked self-criticism, perfectionism, pessimism, and envy (Gill, 1980). A meaningful similarity in

communication style between social anxiety and self-esteem can be described as the tendency to emphasize safety over healthy risk-taking. This similarity led to the prediction that they would be similarly related to dysfunctional text messaging. Indeed, as expected from the literature, social anxiety and self-esteem were strongly negatively correlated.

Multiple regression analyses also indicated the strength of the relationship between self-esteem and dysfunctional text messaging. In both the self-perception of text messaging dependence and the problem use of text messaging models, self-esteem was statistically significant and was the variable which accounted for the majority of the variance. This finding implies that self-esteem may have a more important relationship with dysfunctional text messaging than the other variables measured. Given the strong opportunity for impression management in text messaging, coupled with a tendency for a person with low self-esteem to exhibit a fear of failure and a cautious approach to interpersonal interactions, we can speculate that many people with low self-esteem frequent this communication medium for these reasons (Baumeister, Tice, & Hutton, 1989).

Text Messaging and Emotional Intelligence

It was also predicted that dysfunctional text messaging and emotional intelligence would be correlated negatively. In other words, the less emotionally intelligent someone is, the more likely they are to have an unhealthy relationship with text messaging. A good deal of the rationale behind this hypothesis was based on studies measuring this construct with regard to other forms of Nonverbal Asynchronous Communication, such as the

internet, and with regard to mobile phones in general (Beranuy et al., 2009). Correlational analyses did not support this hypothesis. Emotional intelligence was not significantly correlated with either self-perception of text message dependency scores or text messaging problem use scores.

Curiously enough, when performing multiple regression, while a non-significant relationship was retained between emotional intelligence and problem use of text messaging, emotional intelligence exhibited a statistically significant positive relationship with text messaging dependence and accounted for a good deal of the variance. This was an unanticipated finding, as it was not consistent with the correlations, and as it seems counterintuitive that a higher level of text message dependency is related to a higher level of emotional intelligence. The most likely explanation for the difference in results between the Pearson's correlations and the multiple regression results in this case is the influence of suppressor variables. Given the high level of correlation between the independent variables, they all contributed to removing the error variance from emotional intelligence. By eliminating the error variance, they increase the predictive value of this variable. Although social anxiety and attentional control both contributed as impure suppressor variables, self-esteem was the primary suppressor variable, capable of removing enough error variance from emotional intelligence to make it statistically significant. This is likely the case, as emotional intelligence and self-esteem are highly correlated with each other.

Given the introspective nature of emotional intelligence, perhaps this means that people who are more capable of accurately perceiving and assessing their relationship with text messaging also know themselves better and report more accurately. This finding

suggests that the relationship between text messaging and emotional intelligence should be further explored, and that there is a possibility that it is a relevant factor regarding text messaging dependence.

Text Messaging and Attentional Control

Finally, it was predicted that dysfunctional text messaging and attentional control would be negatively correlated. Results from the correlational analyses supported this hypothesis. Attentional control, the ability to control one's attention voluntarily, showed an inverse correlational relationship with both dysfunctional text messaging scales. Given the ability of the mere presence of a mobile phone to negatively impact the quality of a face-to-face interaction, along with the importance of attentional control in all social engagement, these results were not particularly surprising (Przybylski & Weinstein, 2013). It should be noted that the multiple regression analyses uncovered a non-significant relationship between attentional control and problem use of text messaging, but that a relationship between attentional control and text messaging dependency did approach significance.

Attentional focusing was significantly negatively correlated with both measures of dysfunctional text messaging, and all subscales of those measures, while attentional shifting was not a statistically significant factor in any of them. Attentional focusing is a construct defined as, "the capacity to intentionally hold the attentional focus on desired channels and thereby resist unintentional shifting to irrelevant or distracting channels" (Derryberry & Rothbart, 1988). Thus, as this ability to hold focus decreased, dysfunctional text messaging increased. The results of these analyses seem to imply that

one's ability to multitask is somewhat irrelevant to text messaging dysfunction, and that text messaging may create a vicious cycle in which one's attention is constantly being drawn to it. This unintentional attention shifting would necessarily lead to reduced cognitive resources in other areas, such as face-to-face communication. This also serves to help explain the good deal of research showing the impairment of driving performance while text messaging, and why people are inclined to do it, even though they are often well aware that it is inadvisable and dangerous (Drews et al., 2009).

Limitations

There are a number of limitations regarding the methodology of this study that should be addressed. To begin, of the 184 initial participants, 37 of them had data that, for some reason or another, needed to be deleted. Participant data was deleted in the event of one of two conditions. The first reason for deleting data was participants completing the process in less than eight minutes. Pilot testing of this study made it clear that proper reading and answering of the questions should take more time than that. The second condition was participants failing to answer all of the questions during the experiment.

Another much more pertinent problem was the homogeneity of the sample. Gender was imbalanced, with only 36 of the remaining 147 participants being male. Race was also an issue. Of the remaining 147 participants, 106 of them were white, and 27 of them were black or African-American. These limitations meant that reporting any measurements of gender or racial differences in this study would have been ill-advised.

This is a disappointment, as differences in gender and race with regard to text messaging may be an important avenue for research in such an underexplored topic.

Assessing the frequency with which participants send and receive text messages and the time they spend engaged in the activity proved troublesome. Data varied very widely, and many results were temporally impossible. It is not a surprise that people are not good reporters of their own text messaging use, but these results were clearly not helpful. Early on, an objective of this study was to somehow gain access to participants' phone records for a more objective analysis of their text messaging habits. Unfortunately, this proved logistically impossible for this study.

Directions for Future Research

Due to the newness of the issues, and the scarcity of research regarding unhealthy text messaging relationships, any research is encouraged at this juncture. Results from this study have indicated that there are meaningful relationships between text messaging dysfunction and social anxiety, self-esteem, and attentional control. Researchers may do well to look further into how these variables interact with text messaging and with each other. Specifically, causal relationships between dysfunctional text messaging and these variables would be highly useful in finding ways to address the issues of text messaging dependence and problem use of text messaging, perhaps in clinical samples.

In addition, this study used self-report measures of text messaging activity which may not have been recorded accurately. The Self-perception of Text-Message Dependency Scale and the SMS Problem Use Diagnostic Questionnaire are relatively new measures of the constructs that they are intended to capture. Given that, an objective

measurement of text messaging activity would help to validate them as valuable instruments, as well as provide a good deal of relevant detail regarding the impact of text messaging on face-to-face social situations and the variables measured in this study. In addition, a more direct measurement of Verbal Synchronous Communication abilities would be a helpful supplement.

Finally, given the popularity of cell phones and text messaging amongst children, a study similar to this would be advised in a grade school sample. This study was primarily addressing the issue of dysfunctional text messaging as it relates to Verbal Synchronous Communication abilities. Since children can be understood as novices in the world of face-to-face communication, always learning from their experiences, and peers, it is not a difficult stretch to imagine that the relationships between these factors and dysfunctional text messaging affect them as well. Also, if we are interested in assessing unhealthy relationships with text messaging in children as well as adults, it may be wise to find out if construction of an age-appropriate measure of this construct would be helpful.

Conclusion

In summation, this study concerned itself with exploring relationships between text messaging, a mode of Nonverbal Asynchronous Communication, and Verbal Synchronous Communication abilities. These abilities were operationalized into social anxiety, self-esteem, emotional intelligence, and attentional control. Given the speed at which the medium of text messaging has become a ubiquitous one, a great deal of this radical shift in communication style remains unknown to us. This research, in attempting

to explain a small part of such a complex relationship, stands as a reminder that there is still much that needs to be done in the area of text messaging research, which is still very much in its infant stages. This research suggests that dysfunctional text messaging and undesirable values of high social anxiety, low self-esteem, and a lack of attentional control are significantly related to each other. However, due to the correlational nature of this study, causal studies into these issues should be pursued.

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Appendix A

Self-perception of Text Message Dependency Scale (STDS)

Please indicate the degree to which the statement is characteristic or true of you

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.) After sending a text-message, I check my mailbox repeatedly to see if I had received a response	☐	☐	☐	☐	☐
2.) I feel disappointed if I don't get a reply to my message immediately	☐	☐	☐	☐	☐
3.) I feel anxious when people don't immediately reply to my text-message	☐	☐	☐	☐	☐
4.) I often check my mailbox to see if I had a new text-message	☐	☐	☐	☐	☐
5.) I feel disappointed if I don't receive any text-messages	☐	☐	☐	☐	☐
6.) I sometimes send text-messages while engaging in a conversation with another person	☐	☐	☐	☐	☐
7.) I sometimes spend many hours on text-messages	☐	☐	☐	☐	☐
8.) I often exchange many text-messages in a short period of time	☐	☐	☐	☐	☐
9.) I use text-messages even while I am with friends	☐	☐	☐	☐	☐
10.) I consider myself a	☐	☐	☐	☐	☐

quick-typist on mobile phones					
11.) I cannot maintain new friendships without text-messages	☐	☐	☐	☐	☐
12.) I cannot form any new relationships without using text-messages	☐	☐	☐	☐	☐
13.) I think my relationships would fall apart without text-messages	☐	☐	☐	☐	☐
14.) Without text-messages, I would not be able to contact friends whom I cannot meet on a daily basis	☐	☐	☐	☐	☐
15.) Without using test-messages, I cannot say what is on my mind	☐	☐	☐	☐	☐

Appendix B

SMS Problem Use Diagnostic Questionnaire (SMS-PUDQ)

Text Messaging Survey

The following are phrases describing people's Text Messaging behaviors. Please use the rating scale below to describe how accurately each statement describes *you*; Very Inaccurate (VI), Moderately Inaccurate (MI), Neither Inaccurate nor Accurate (N), Moderately Accurate (MA), or Very Accurate (VA). Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Please read each statement carefully, and then check the corresponding box.

VI = Very Inaccurate
MI = Moderately Inaccurate
N = Neither Inaccurate nor Accurate
MA = Moderately Accurate
VA = Very Accurate

Answer the following questions about text-messaging

	VI	MI	N	MA	VA
1. I feel preoccupied with using text-messaging (I think about previous text-messaging activity or anticipate next opportunity to use text-messaging).	☐	☐	☐	☐	☐
2. I feel the need to use text-messaging with increasing amounts of time to achieve satisfaction.	☐	☐	☐	☐	☐
3. I have repeatedly made unsuccessful attempts to control, cut back, or stop text-messaging use.	☐	☐	☐	☐	☐
4. I feel restless, moody, depressed, or irritable when attempting to cut down or stop text-messaging use.	☐	☐	☐	☐	☐
5. I use text-messaging longer than originally intended.	☐	☐	☐	☐	☐
6. I have jeopardized or risked the loss of a significant relationship, job, educational, or career opportunity because of text-messaging.	☐	☐	☐	☐	☐
7. I have lied to family members, therapists, or others to conceal the extent of involvement with text-messaging.					

	☐	☐	☐	☐	☐
8. I use text-messaging as a way of escaping from problems or of relieving a bad mood (e.g., feelings of helplessness, guilt, anxiety, depression).	☐	☐	☐	☐	☐

Appendix C

Demographic Questionnaire

What is your age? _____

Circle the answer which best describes your sex:

Male Female

Circle the answer which best describes your race:

Hispanic or Latino American Indian or Alaska Native Asian

Black or African American Native Hawaiian or Pacific Islander White

When did you first begin using text messaging services?

On average, how many text messages would you say you *send* per day? _____

On average, how many text messages would you say you *send* per week? _____

On average, how many text messages would you say you *receive* per day? _____

On average, how many text messages would you say you *receive* per week? _____

On average, how much time would you say you spend engaged in text messaging

(writing, reading, sending, checking, etc.) per day? _____

On average, how much time would you say you spend engaged in text messaging (writing, reading, sending, checking, etc.) per week? _____

How frequently would you say you use test messaging in class?

Never	Rarely	Sometimes	Often	All of the time
☐	☐	☐	☐	☐

Appendix D

Social Anxiety Questionnaire for Adults (SAQ-A30)

Below are a series of social situations that may or may not cause you UNEASE, STRESS or NERVOUSNESS. Please select the circle that best reflects your reaction in terms of unease, stress, or nervousness.

If you have never experienced the situation described, please **imagine** what your level of UNEASE, STRESS, or NERVOUSNESS might be if you were in that situation, and rate how you imagine you would feel by selecting the corresponding option.

Please rate all the items and do so **honestly**; do not worry about your answer because there are no right or wrong ones. Thank you very much for your collaboration.

1. Greeting someone and being ignored

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

2. Having to ask a neighbor to stop making noise

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

3. Speaking in public

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

4. Asking someone attractive of the opposite sex for a date

Not at all or very slight
Slight
Moderate
High

Very High or Extremely High

5. Complaining to the waiter about my food

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

6. Feeling watched by people of the opposite sex

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

7. Participating in a meeting with people of authority

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

8. Talking to someone who isn't paying attention to what I am saying

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

9. Refusing when asked to do something I don't like doing

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

10. Making new friends

Not at all or very slight
Slight

Moderate
High
Very High or Extremely High

11. Telling someone that they have hurt my feelings

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

12. Having to speak in class, at work, or in a meeting

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

13. Maintaining a conversation with someone I've just met

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

14. Expressing my annoyance to someone that is picking on me

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

15. Greeting each person at a social meeting when I don't know most of them

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

16. Being teased in public

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

17. Talking to people I don't know at a party or a meeting

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

18. Being asked a question in class by the teacher or a superior in a meeting

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

19. Looking into the eyes of someone I have just me while we are talking

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

20. Being asked out by a person I am attracted to

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

21. Making a mistake in front of other people

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

22. Attending a social event where I only know one person

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

23. Starting a conversation with someone of the opposite sex that I like

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

24. Being reprimanded about something I have done wrong

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

25. While having dinner with colleagues, classmates, or workmates, being asked to speak on behalf of the entire group

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

26. Telling someone that their behavior bothers me and asking them to stop

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

27. Asking someone I find attractive to dance

Not at all or very slight
Slight
Moderate

High
Very High or Extremely High

28. Being criticized

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

29. Talking to a superior or a person in authority

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

30. Telling someone I am attracted to that I would like to get to know them better

Not at all or very slight
Slight
Moderate
High
Very High or Extremely High

Appendix E

Rosenberg Self-Esteem Scale

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

1.) On the whole, I am satisfied with myself.

Strongly Agree Agree Disagree Strongly Disagree

2.) At times I think I am no good at all.

Strongly Agree Agree Disagree Strongly Disagree

3.) I feel that I have a number of good qualities.

Strongly Agree Agree Disagree Strongly Disagree

4.) I am able to do things as well as most other people.

Strongly Agree Agree Disagree Strongly Disagree

5.) I feel I do not have much to be proud of.

Strongly Agree Agree Disagree Strongly Disagree

6.) I certainly feel useless at times.

Strongly Agree Agree Disagree Strongly Disagree

7.) I feel that I'm a person of worth, at least on an equal plane with others.

Strongly Agree Agree Disagree Strongly Disagree

8.) I wish I could have more respect for myself.

Strongly Agree Agree Disagree Strongly Disagree

9.) All in all, I am inclined to feel that I am a failure.

Strongly Agree Agree Disagree Strongly Disagree

10.) I take a positive attitude toward myself.

Strongly Agree Agree Disagree Strongly Disagree

Appendix F

Emotional Intelligence Scale (EIS)

Please indicate the degree to which the statement is characteristic or true of you

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.) I know when to speak about my personal problems to others	☐	☐	☐	☐	☐
2.) When I am faced with obstacles, I remember times I faced similar obstacles and overcame them	☐	☐	☐	☐	☐
3.) I expect that I will do well on most things I try	☐	☐	☐	☐	☐
4.) Other people find it easy to confide in me	☐	☐	☐	☐	☐
5.) I find it hard to understand the non-verbal messages of other people	☐	☐	☐	☐	☐
6.) Some of the major events of my life have led me to re-evaluate what is important and not important	☐	☐	☐	☐	☐
7.) When my mood changes, I see new possibilities	☐	☐	☐	☐	☐
8.) Emotions are one of the things that make my life worth living	☐	☐	☐	☐	☐
9.) I am aware of my emotions as I experience them	☐	☐	☐	☐	☐
10.) I expect good things to happen	☐	☐	☐	☐	☐
11.) I like to share my emotions with others	☐	☐	☐	☐	☐
12.) When I experience a positive emotion, I know how to make it last	☐	☐	☐	☐	☐

13.) I arrange events others enjoy	☐	☐	☐	☐	☐
14.) I seek out activities that make me happy	☐	☐	☐	☐	☐
15.) I am aware of the non-verbal messages I send to others	☐	☐	☐	☐	☐
16.) I present myself in a way that makes a good impression on others	☐	☐	☐	☐	☐
17.) When I am in a positive mood, solving problems is easy for me	☐	☐	☐	☐	☐
18.) By looking at their facial expressions, I recognize the emotions people are experiencing	☐	☐	☐	☐	☐
19.) I know why my emotions change	☐	☐	☐	☐	☐
20.) When I am in a positive mood, I am able to come up with new ideas	☐	☐	☐	☐	☐
21.) I have control over my emotions	☐	☐	☐	☐	☐
22.) I easily recognize my emotions as I experience them	☐	☐	☐	☐	☐
23.) I motivate myself by imagining a good outcome to tasks I take on	☐	☐	☐	☐	☐
24.) I compliment others when they have done something well	☐	☐	☐	☐	☐
25.) I am aware of the non-verbal messages other people send	☐	☐	☐	☐	☐
26.) When another person tells me about an important event in his or her life, I almost feel as though I have	☐	☐	☐	☐	☐

experienced this event myself					
27.) When I feel a change in emotions, I tend to come up with new ideas	☐	☐	☐	☐	☐
28.) When I am faced with a challenge, I give up because I believe I will fail	☐	☐	☐	☐	☐
29.) I know what other people are feeling just by looking at them	☐	☐	☐	☐	☐
30.) I help other people feel better when they are down	☐	☐	☐	☐	☐
31.) I use good moods to help myself keep trying in the face of obstacles	☐	☐	☐	☐	☐
32.) I can tell you how people are feeling by listening to the tone of their voice	☐	☐	☐	☐	☐
33.) It is difficult for me to understand why people feel the way they do	☐	☐	☐	☐	☐

Appendix G

Attentional Control Scale (ACS)

Please indicate the degree to which the statement is characteristic or true of you

	Almost Never	Sometimes	Often	Always
1.) It's very hard for me to concentrate on a difficult task when there are noises around.	☐	☐	☐	☐
2.) When I need to concentrate and solve a problem, I have trouble focusing my attention.	☐	☐	☐	☐
3.) When I am working hard on something, I still get distracted by events around me.	☐	☐	☐	☐
4.) My concentration is good even if there is music in the room around me.	☐	☐	☐	☐
5.) When concentrating, I can focus my attention so that I become unaware of what's going on in the room around me.	☐	☐	☐	☐
6.) When I am reading or studying, I am easily distracted if there are people talking in the same room.	☐	☐	☐	☐
7.) When trying to focus my attention on something, I have difficulty blocking out distracting thoughts.	☐	☐	☐	☐
8.) I have a hard time concentrating when I'm excited about something.	☐	☐	☐	☐
9.) When concentrating I ignore feelings of hunger or thirst.	☐	☐	☐	☐

10.) I can quickly switch from one task to another.	☐	☐	☐	☐
11.) It takes me a while to get really involved in a new task.	☐	☐	☐	☐
12.) It is difficult for me to coordinate my attention between the listening and writing required when taking notes during lectures.	☐	☐	☐	☐
13.) I can become interested in a new topic very quickly when I need to.	☐	☐	☐	☐
14.) It is easy for me to read or write while I'm also talking on the phone.	☐	☐	☐	☐
15.) I have trouble carrying on two conversations at once.	☐	☐	☐	☐
16.) I have a hard time coming up with new ideas quickly.	☐	☐	☐	☐
17.) After being interrupted or distracted, I can easily shift my attention back to what I was doing before.	☐	☐	☐	☐
18.) When a distracting thought comes to mind, it is easy for me to shift my attention away from it.	☐	☐	☐	☐
19.) It is easy for me to alternate between two different tasks.	☐	☐	☐	☐
20.) It is hard for me to break from one way of thinking about something and look at it from another point of view.	☐	☐	☐	☐

Appendix H

Informed Consent Form

CONSENT TO PARTICIPATE IN RESEARCH

Text Messaging and Factors Involving Communication

You are invited to participate in a research study conducted by Sean Nelson (Principle Investigator and graduate student in clinical psychology) in fulfillment of a requirement for a master's degree in clinical psychology from the Psychology Department and Eastern Illinois University.

Your participation in this study is entirely voluntary. Please ask questions about anything you do not understand, before deciding whether or not to participate.

• PURPOSE OF THE STUDY

This study is designed to assess text messaging behavior and its relationship with various psychological factors.

• PROCEDURES

If you volunteer to participate in this study, you will be asked to complete a brief demographic questionnaire, including questions about age, sex, and ethnic background. Then you will complete two questionnaires including questions about text messaging. Next, you will complete a questionnaire that measures your level of social anxiety. Next, you will complete a questionnaire measuring your self-esteem. In the remainder of the study, you will be asked to complete a questionnaire assessing emotional qualities, and a questionnaire measuring attention. After completing these questionnaires, the study will be over. Questions should take 30 minutes to complete.

• POTENTIAL RISKS AND DISCOMFORTS

Certain questions may provoke discomfort. If you experience discomfort as a result of participation in this study, you are welcome to make an appointment at the EIU Counseling Center. You can visit them on the first floor of the Human Services Building Monday through Friday from 8:00 am-4:30 pm. You may also contact them at 217-581-3413. In case of emergency please call the Counseling Center at 217-581-3413. For emergencies after-hours and on weekends, you may reach a local crisis counselor at 1-866-567-2400. Also know that you can end your participation in this study at any time without consequence.

- **POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY**

There are no explicit benefits to participating, beyond the experience of having participated in psychological research. However, participation may shed light on the role of text messaging in various psychological domains.

- **INCENTIVES FOR PARTICIPATION**

Opportunities for extra credit in psychology course

- **CONFIDENTIALITY**

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of storing the informed consent forms, which are the only forms with identifying information, is a locked filing cabinet in the psychology laboratory. The only people who will have access to any responses will those directly involved in analyzing the results of the study.

- **PARTICIPATION AND WITHDRAWAL**

Participation in this research study is voluntary and not a requirement or a condition for being the recipient of benefits or services from Eastern Illinois University or any other organization sponsoring the research project. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind or loss of benefits or services to which you are otherwise entitled.

- **IDENTIFICATION OF INVESTIGATORS**

If you have any questions or concerns about this research, please contact:

Principal Investigator: Sean Nelson, B.A.: Senelson@eiu.edu

Faculty Sponsor: Russell Gruber, Ph.D.: 217-581-6614, regruber@eiu.edu

- **RIGHTS OF RESEARCH SUBJECTS**

If you have any questions or concerns about the treatment of human participants in this study, you may call or write:

Institutional Review Board
Eastern Illinois University
600 Lincoln Ave.
Charleston, IL 61920
Telephone: (217) 581-8576
E-mail: eiuirb@www.eiu.edu

You will be given the opportunity to discuss any questions about your rights as a research subject with a member of the IRB. The IRB is an independent committee composed of members of the University community, as well as lay members of the community not connected with EIU. The IRB has reviewed and approved this study.

I voluntarily agree to participate in this study. I understand that I am free to withdraw my consent and discontinue my participation at any time. I have been given a copy of this form.

_____
Printed Name of Participant

_____ _____
Signature of Participant Date

Appendix I

Debriefing Form

Thank you for your participation in this research on the relationship between text messaging, social anxiety, self-esteem, emotional intelligence, and attentional control. The scales were designed to measure each of these domains.

Despite widespread use of this form of media, there is very limited research regarding problematic use or dependence on text messaging services. Research suggests that individuals who regularly use text messaging can have problematic or dependent relationships with this form of communication. Research further suggests that, as text messaging is non-verbal and asynchronous, meaning that there is no voice or turn-taking involved, many individuals prefer this medium to protect themselves from feared aspects of social situations, such as judgments by others. This line of research also suggests that people who used text messaging frequently may prefer the control that text messaging gives them in social situations and its impression management capabilities. These findings suggest a pattern of avoidance of feared social situations which, while acting as a buffer from anxiety, reduce the possibility of training in these social skills by engaging in them until the person can feel comfortable. It is thought that this lack of practice may serve to make these situations even more uncomfortable over time. Research also suggests that the mere presence of a cell phone draws attention away from face-to-face social interactions by unconsciously reminding people of the wider social world.

The hypothesis included the expectation that dysfunctional text messaging would correlate positively with social anxiety. This means that when rates of dysfunctional text messaging increase, levels of social anxiety should be expected to increase. We also predicted a negative correlation between dysfunctional text messaging and self-esteem, emotional intelligence, and attentional control. This means that when rates of dysfunctional text messaging increase, levels of each of these psychological factors should decrease.

Your participation was important in helping researchers learn how text messaging impacts human psychology. The findings in this study should help shed light on the complex, and still largely unknown relationships between text messaging and communication.

This research is ongoing. At your request, Sean Nelson or Dr. Russell Gruber will be happy to provide a summary of the research results when the study is completed. All results are grouped together; therefore, individual results are not available. Your participation will remain confidential.

If you have any additional questions regarding this research, including questions about any of the above terms or how they relate to text messaging, please contact Sean Nelson at senelson@eiu.edu or Dr. Russell Gruber at (217) 581-6614 or regruber@eiu.edu.