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Exploring Generational Differences in Text Messaging Usage and Habits

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By

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APPROVAL PAGE

We hereby certify that this dissertation, submitted by Daniel Long, conforms to acceptable standards and is fully adequate in scope and quality to fulfill the dissertation requirements for the degree of Doctor of Philosophy.

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Members of society today embrace multiple communication media for various purposes and intents. Text messaging has been identified as the medium of choice for continual relationship maintenance and text messaging from mobile devices overshadows all other media forms for the support of social connections. Text messaging is changing everything from how operators market their plans to how advertisers and service providers reach consumers. But just as technology usage of social media and internet access are different across generational boundaries, text messaging usage and habits may also be different for various generational groups. The majority of peer-reviewed research regarding text messaging usage habits has focused on adolescent and young adult users with less attention on text messaging usage habits by older adults; there is a scarcity of peer-reviewed research examining cross-generation text messaging habits and texting usage patterns. The primary goal of this study was to assess the similarities and differences in text messaging usage habits, purposes, and support of social connections differentiated by five of the commonly designated generational groups in America; the Post-War Silent Generation, Baby Boomers, Generation X, Millennials, and Generation Z. A mixed methods study provided data on the text messaging usage habits of members of the generational groups using a pool of adult college students, members of the researcher's LinkedIn network, and data from a survey service to determine to what extent differences and similarities exist between users' text messaging usage habits within each generational group. Results indicated generational group membership has a significant effect on a participant's messaging volume (UV), text messaging partner choices (TMPC), and text messaging social habits (SH), regardless of gender, education level, or employment status. The older the generational group, the more likely they are to prefer talking over texting and to have issues with the device interface. The Post-War Silent generation texts their spouses the least of any group, while Generation X texts their spouses the most, and all generational groups with the exception of Generation Z would limit texting while driving. Generational characteristics seem to have some influence over texting behaviors. Contributions to the existing body of knowledge in the human computer interaction field include an investigation of factors that contribute to each generational group's willingness to embrace or reject the text messaging medium, and an investigation into the into how each generation views and exploits the texting medium.

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Chapter 1

Introduction

Background

One very important developmental task in adolescence and young adulthood is learning how to create and maintain friendly, intimate, and meaningful relationships with peers, family, and other social contacts (Koutamanis et al., 2013). Initially, such communications were face-to-face, but juxtaposed with the need for such communication and interaction has been the use of the prevailing distance communications technologies of the time to facilitate non-face-to-face social interaction. From the postal system, telegraphs, telephones, e-mail, and the Internet (Winston & Winston, 1998), to social networking sites and the current mobility and ubiquity of interactive communications using smart mobile devices, people have always embraced technology to facilitate their interactions with others.

A prevalent technology medium often employed is that of text messaging in order to maintain those social connections (Reid & Reid, 2007; Valkenburg & Peter, 2011). While parents in previous generations fretted about the number of hours teens spent on the telephone, "today's teens aren't spending hours on landlines, but they are still conversing … sending text messages to friends. Both entertainment and sociality are key reasons why teens invest so much energy in their online activities" (Boyd, 2014, p. 79).

However, the perception that using such technology is the domain of only the young is not supported; the use of technology to support social connections permeates across generational boundaries (Gell et al., 2015; Boot et al., 2015). Although initially embraced by younger adults, older adults have emerged as an important information communication technology (ICT) consumer group; ICT is enabling older adults' abilities to maintain connectivity with family and friends, to access health services, and to augment participation in both leisure and routine activities (Boot et al., 2015). Technology continues to evolve and to saturate more and more aspects of social communication channels, but the value and importance of social connections, connections to other people, has not lessened (Putnam, 1993; Glaeser et al., 2002; Carver et al., 2018).

Of the information communication technologies currently available, text messaging or SMS text messaging, is particularly popular among older adults as opposed to e-mail and is the most frequently used mobile phone feature (Gell et al., 2015). Research indicates this may stem primarily from the fact little technological expertise is required for sending and receiving SMS text messages (Gell et al., 2015; Zhou et al., 2014); typing on a QWERTY keyboard is a skill with which most adults already have some familiarity. Although voice assistance (voice-to-text) applications are becoming more widespread and appear to provide the most positive experience for entering text data across all generations (Smith & Chaparro, 2015), their large-scale adoption has not yet been observed, as there are still few well-defined scenarios for such adoption and widespread usage is not likely soon (Yap, 2012). However, before investing time and resources to make SMS and other texting technologies more accessible and useable

across the different age groups, the usage habits and patterns of the various generations among the population need to be fully examined and compared.

This study is organized in the following manner. First, a statement of the specific problem that has been researched will be presented. Addressed next are the main research questions, as well as the relevance and significance of the research. A literature review of related areas of research is presented within each of the relevant areas: generational groups, as designated by five of the six commonly designated living generational groups in America; the Post-War Silent Generation, Baby Boomers, Generation X, Millennials, and Generation Z); text messaging, and social relationship maintenance, denoting any gaps in the literature. Specific barriers, issues, limitations, and assumptions are described and methodology for the research and analysis approaches are discussed and defended. Finally, the research results and conclusions are presented, followed by a discussion of the implications, and recommendations for future studies.

Problem Statement

The research problem addressed by this study is that although every generational group participates in text messaging on smart devices, there is little specific research investigating whether or not their text messaging usage habits are similar in terms of volume, choice of texting partners, or urgency and purpose of communication across those generations. The scant existing research is contradictory, inconsistent, dated, or at best, inconclusive.

Some studies indicate little differences in the learning characteristics of technology use between generations. In one study, the conclusion that “there is a digital

divide of technology use based on generations is not substantiated empirically" (Lai & Hong, 2014, p. 726). Other research complements this as well; perceived usability ratings for physical QWERTY text input among both younger and older smart device users differed by less than 10% (Smith & Chaparro, 2015). Issues associated with texting while driving have long been the subjects of many researchers (Ling, 2004; Rosenberger, 2013; Takao et al., 2009; Watkins et al., 2011; White et al., 2004; Billieux, 2012), but only one specifically addresses driving and texting habits combined with the age of the participants: research in 2013 by the AAA Foundation for Traffic Safety, using data collected in 2013 from 2,325 licensed drivers 16 and older indicated although those over the age of 60 were least likely to use a cell phone while driving, 72% of those between 40 and 59 admitted to using their cell phones while driving. This was compared to 58% of teens, and concluded adult drivers are by far the likeliest age group to admit to using their phone while driving (AAA Foundation, 2014). Age does not seem to be a strong consideration when it comes to cellular technology - consumers of all ages seem to have embraced cell phones. As of January, 2017, over 95% of all Americans own a cell phone of some kind. This includes 97% of adults between the ages of 50 and 64, and 80% of adults 65 and older (Pew Research Center, 2017). Another study conducted by Guo, Dobson and Petrina (2008) did not find any significant differences in university students aged 20 to over 40 on self-perceptions of information technology competence.

Other studies come to very different conclusions, finding younger individuals to be more likely to make contacts with a text message whereas older individuals are more likely to call or use an email or other social media networks for same sex friends (Forgays et al., 2014), and generational differences were found to be strong determinants

in attitudes and choices regarding technology - older adults also reported being less anxious than other groups if they realized they had left their cell phone at home and were less likely than younger groups to report technology had significantly altered how they communicate with others (Van Volkom et al., 2014). Younger people have been depicted as *digital natives* (Prensky, 2001; Becker, 2009; Chen & Yan, 2016; Čičević et al., 2016; Kitzing et al., 2009; Sherman et al., 2013) while older people have been described as *digital immigrants* (Prensky, 2001; Boyd, 2014; Chen & Yan, 2016; Frederick et al., 2014; Lepp et al., 2014; Sherman et al., 2013).

Dissertation Goal

This mixed methods research has been conducted to assess and compare the usage of the text messaging medium in support of social relationship maintenance across various generations, to better understand the similarities and differences in generational usage habits in support of the fulfillment of social needs. An examination of the usage habits of the participants with respect to volume of usage, selection of conversation partners, various text messaging social habits, (support connection for business, emotional support, life-event coordination and maintaining relationships) and with respect to usage, contact urgency, has been done to determine similarities and differences in these habits across generations. To accomplish this, data was solicited via a survey using a pool of randomly recruited adult college students and their extended social networks as well as members of the researcher's LinkedIn social media network, and their extended social networks. In addition, in order to ensure an adequate statistical sample representative of the population, supplementary surveys were solicited through the survey service Survey Monkey. These surveys, administered online, consisted of

various questions that solicited information about the participants' usage volumes, usage purposes, and choices of texting partners, as well as several demographic indicators. Many similar studies have utilized a collegiate pool as their survey data source (Ahn & Shin, 2013; Bian & Leung, 2015; Čičević et al., 2016), and more recently, social networking service platforms such as Facebook and LinkedIn have been found to be an effective method to recruit individuals (Lohse, 2013; Brooks and Churchill, 2010) and to offer a way to construct snowball samples for exploratory work (Bhutta, 2012). For the purposes of this study, "text messaging usage habits" refer to the regular and established tendencies, practices, purposes, volumes, and partner selections with which a participant employs the text messaging medium to support social interaction.

After a detailed analysis was performed and the quantitative data was assessed, a supplemental qualitative study was conducted. This was accomplished by interviewing a selection of between four and six persons from each of the five generational groups to further delineate any commonalities or differences that might have occurred among the variables, and to assist in determining the usage behaviors of the generational groups and the possible motivations behind these behaviors.

Research Questions

Research questions were used to determine what, if any, current correlations exist between text messaging usage habits of participants and social connections across generational groups, using the participant's generational group as a control variable:

RQ1: How does a person's generational group affect their text messaging usage habits?

RQ2: How does a person's generational group affect their text messaging usage habits when controlling for gender?

RQ3: How does a person's generational group affect their text messaging usage habits when controlling for employment status?

RQ4: How does a person's generational group affect their text messaging usage habits when controlling for education level?

RQ5: What are the behaviors and characteristics of the various generational groups with regard to text messaging usage habits?

Relevance and Significance

The study is relevant as it seeks to facilitate a better understanding of how, how often, and to what purpose (why) various generations utilize text messaging in support of social and professional relationship network maintenance, and event scheduling. In viewing these interactions through the lens of social exchange theory it suggests people engage in social interaction in anticipation it will lead to social rewards: improved status, peer approval, admiration, and respect (Blau, 1964). Building reputation appears to be a strong motivator towards encouraging active engagement (Donath, 1999), and in online organizations and communities outside the workplace, people intimated they increased status by responding with some frequency (Lakhani & von Hippel, 2003). Thus, the perception that contributing knowledge will enhance one's reputation and status may motivate individuals to contribute their valuable, personal knowledge to others in the network. This understanding of interpersonal disclosure in online social networking is a superlative application of social networking theory (Posey et al., 2010); reciprocation and mutual satisfaction are the principle benefits of engagement, and privacy concerns were

juxtaposed with the desire for interpersonal awareness in driving the use of self-disclosure technologies in the context of instant messaging (Lowry et al., 2011).

Complementing this viewpoint are several studies supporting the use of the social capital theory in examination of social media interactions; “evidence that the use of smartphones for different purposes (especially for information seeking, sociability, and utility) … significantly impacted social capital building” (Bian & Leung, 2014, p. 1), “online communication with the mobile phone is positively related to various indicators of subjective well-being and bonding and bridging capital” (Chan, 2015, p. 96), and when text messaging conversations occurring between face-to-face meetings were found to positively impact bonding social capital (Stephens et al., 2017).

Viewed in the social capital and social exchange context, other research has shown understanding the possible usage differences between the various generations can assist in the design of better and more targeted interfaces which are easier to learn, more likely to be used and more useful (Gould & Lewis, 1983 This will assist in the design of more relevant and directed services catering to the overall consumer base, helping to ensure technology is not an obstacle, but an enhancement and augmentation to communication (Thrunher, 2004).

From a practical point of view, this research is important for any organization relying on text messaging communications with employees, business partners, or customers. This addresses the current scarcity of peer-reviewed research examining cross-generation text messaging habits and texting usage patterns. It will help to advance current research in technology support of social relationship maintenance and facilitate an increase in the body of knowledge regarding various generations’ behaviors as they relate to their awareness, habits, and practices in the context of socially-mediated technology-

assisted relationship maintenance. Recognizing these patterns and ultimately having better understanding of their clients can help developers to design better interfaces which more accurately address the needs of multiple generations of users. Designing with the end-user in mind, with a "thorough understanding of the diverse community of users and the tasks that must be accomplished" (Shneiderman, & Plaisant, 2017, p. 13) can encourage and assist interface designers in creating more usable and suitable designs, as well as provide social support systems and organizations with a better understanding of how various generations use the texting medium. By fully understanding the relationship between technology and those it serves, developers will be better positioned to create technology which will better serve the needs and requirements of the user community.

Barriers and Issues

The objectives of this research have been to determine the effect a person's generational group may have on text messaging usage habits, and whether there are any usage correlations with regard to demographic indicators such as gender, employment status, or education level. One realized barrier for this study was obtaining access to a sufficient number of valid participants willing to complete the survey. This was addressed by soliciting input from multiple input sources: a collegiate pool, a social media pool, the extended networks of all participants, and the additional supplemental data provided by the engagement of a professional survey service, Survey Monkey, to ensure a sufficient number of generational group responses.

Another potential barrier concerned the validity and appropriateness of the survey questions and scales to be used to test each of the proposed constructs. To address this, an expert Delphi committee was employed to review the survey questions for bias,

ambiguous wording or other issues. Initial pass responses from the five committee members indicated no bias within the questions but noted other concerns and considerations. It was the opinion of the committee that the Likert scale employed would be more accurate and meaningful to the participants using the nomenclature of "never-rarely-sometimes-often-always" rather than a "strongly agree-agree-neither agree nor disagree-disagree-strongly disagree". There was also a concern from one committee member that one of the questions was potentially an outlier. Discussion and clarification of the purpose of the question led to the conclusion that it was in the same context as another question in the survey and not an outlier, as both questions are determinants of acceptable and unacceptable texting behavior in various social settings. General clean-up and consistency checks in the formatting and punctuation in the participation letter and in the survey were also addressed by the committee, and after several iterations, committee consensus was achieved.

Assumptions, Limitations, and Delimitations

There were several assumptions regarding the participant responses. It was assumed that participants would complete the survey in its entirety, be reasonably accurate in their recollection of their text-messaging usage frequencies, be honest in reporting their text-messaging habits, and be active users of the text-messaging medium on a mobile device.

Several possible limitations to this research exist which must be considered and addressed. To combat the limiting issue of low completion rates, a pilot study was conducted first to improve on the number of questions, question sequencing, formatting,

and clarity (Fan & Yan, 2010). Although the student population selected was ethnically, culturally, and generationally diverse, there was a concern that it might not offer significant diversity in terms of economics and education: there may be inherent class bias or underrepresentation of some social class memberships. This concern was somewhat alleviated by the inclusion of snowball sampling and usage of the third-party survey service to compensate for this and to provide a better social class cross section. Another concern was the limiting factor associated with survey participants being required to have reached 18 years of age to participate in the study. Members of Generation Z, those born in 1996 or later (Novak, 2012; Zemke et al., 2000; Carrier et al., 2009; Kitch, 2003; Twenge, 2014; Underwood, 2017), may be underrepresented in the student population and LinkedIn connections. Although obtaining a significant number of participants was not an issue, those persons surveyed that were between the ages of 18 and 21 are effectively representing all persons born after 1995. They may not necessarily provide a significantly strong cultural identity with their Generation Z group peers under the age of 18. Another delimitation employed by the study was the exclusion of those born prior to 1927. The difficulty in finding a sufficient number of constituents of this group coupled with their relatively small percentage of the overall population make it necessary and valid to remove them from consideration as participants in this study. The random elimination of many survey respondents in order to stratify the sample to be representative of the generational groups proportional to the population could potentially skew the results. It was felt that this would be a more accurate approach than to have over-representation of any of the generational groups.

Definition of Terms

Generational Group - In America, there are six living generations, distinct groups of people, with different likes, dislikes, and attributes. They have had collective experiences as they aged and therefore have similar ideals. The six commonly designated living generational groups in America are; the GI Generation, those born before 1928; the Post-War Silent Generation, born between 1928 and 1945; the Baby Boomers, born between 1946 and 1965; Generation X, born between 1966 and 1978; Millennials, born between 1979 and 1995; and Generation Z, born after 1995 (Novak, 2012)

Text messaging partner choices (TMPC) - the primary targets and partners with whom a participant exchanges text messages (Forgays, Hymnam, and Schrieber, 2013) such as friends, family, spouse or significant others, work-related, sales and coupon messages, or messaging alerts from healthcare practitioners or emergency alerts.

Text messaging social habits (SH) - the use of texting for business, emotional support, relationship maintenance, or coordination of events, and the urgency of response to texts for those connection purposes.

Text messaging usage habits - The combination of a person's text messaging volume (UV), their choice of texting partners (TMPC), and the social habits they maintain (SH) with respect to the texting medium.

Text messaging usage volume (UV) – the number of text messages sent and received by a participant in a given time.

Summary

Chapter one served to introduce this study, identify the research problem to be addressed, and present a theoretical foundation. The research problem that this study addressed was that although every generational group participates in text messaging on smart devices, there is little specific research investigating whether or not their text messaging usage habits are similar in terms of volume, choice of texting partners, or urgency and purpose of communication across those generations. Text messaging has been identified as the medium of choice for multiple generational groups for the maintenance of relationships, social connections, scheduling of life events, and to offer emotional support. It surpasses all other media forms with regard to the support of social connections.

This chapter also presented a measurable research goal and four specific research questions addressed by the study. The main goal of this study was to assess and compare the usage of the text messaging medium in support of social relationship maintenance across various generations, in order to better understand the similarities and differences in support of the fulfillment of social needs. The usage habits of the participants with respect to volume of usage, selection of conversation partners, text messaging social habits, were examined to determine similarities and differences in these habits across generations.

The relevance and significance of this study were also presented in this chapter. This study's relevance stems from a need to have a better understanding of how, how often, and to what purpose (why) various generations utilize text messaging in support of social and professional relationship network creation and maintenance, and the

scheduling of life events. The significance of this study is that it documented key usage patterns across the generations, which can be used to for developers to design more targeted interfaces and for social support organizations to provide a better experience and more directed services to their clients.

The final sections of the chapter included a discussion of the known limitations, delimitations, barriers, and issues associated with this study. The chapter concluded with a definition of terms used in the study, along with their acronyms.

Chapter 2

Review of the Literature

Introduction

In this chapter, a literature review was presented to review the relevant literature associated with the maintenance of social connections through the medium of text messaging, the categorization of populace into generational groups and the characteristics of such groups, and support of the text messaging technology as the medium of choice above all others for non-collocational interactions for maintaining social communication networks. This review provided an understanding about these areas, illustrating what is already recognized about these constructs, and supports the framework of the hypothesis and research questions, in so doing creating a solid foundation for this study.

Social Connections through Texting

Supporting studies indicated social connections continue to provide people with resources (Valenzuela et al., 2009) and the emerging adulthood core developmental tasks are still much the same today as they have been in the past (Pempek, et al., 2009). A review of the extant literature has many examples of technology mediated communication (TMC), and computer mediated communication (CMC) to support social communications for satisfaction or gratification (Auter 2007; Boyd 2014; Grellhesl & Punyanunt-Carter 2012; Hall & Baym 2012; Lepp et al. 2014; Quan-Haase & Young

2010; Caughlin, J, Basinger, E., & Sharabi, 2016). Technology in the form of text messaging is often used to maintain those social connections useful for identity development. Maintenance of social relationships is a task for which text messaging is reportedly ideally suited: text messaging is the preferred medium of relationship maintenance (Reid & Reid, 2007), and can augment opportunities to learn and rehearse social skills in a less inhibited virtual environment (Valkenburg & Peter, 2011). In a study in China, the formation and maintenance of personal relationships were found to be the most important use of texting technology (Xia, 2012). Another area of research focused upon the addictive nature of mobile devices (Odaci & Çelik, 2013; Salehan & Negahban, 2013; Sultan 2014), or on the user's dependency on mobile devices (Hall & Baym, 2012; Igarashi et al., 2008; Lapointe et al., 2013; Toda et al., 2008), but these studies are not specific to text messaging as the medium.

Text messaging has become a powerful tool for communication, especially among young adults, from adolescent through college (Lenhart, 2010). It is a convenient, easy to use, low cost communication method; consequently, people have become reliant upon text messaging to maintain daily relationships with friends, family and other acquaintances, as well as being a significant vehicle for establishing their own identity. Skierkowski and Wood (2012), in researching the frequencies and patterns of alternative behaviors, non-compliance, and anxiety measured during separate restriction periods among a group of high and low text users, ages 18–23, illustrated how text messaging has been perceived by adolescents and young adults in comparison with other computer mediated communications, highlighting the importance of text messaging in normal daily maintenance of relationships. Text messaging is the medium of choice for relationship

maintenance, and more specifically conflict management with dyads, as it allows the texting partners to plan out their messages and gave them more time to get their emotions under control (Perry & Werner-Wilson, 2011). Reid and Reid (2004) alluded text messaging is the combination of the social aspect of the chat room coupled with the psychological distance of electronic mail and thus lends texting a special, but contradictory appeal to a significant number of users. It provides mobile, instantaneous, near real-time conversations while at the same time allows the participant time to compose and reflect before responding, and provides the opportunity to manage and filter their self-presentation (Ling & Yttri, 2002).

Personal relationship formation and maintenance are the most important social interactions through mobile texting in everyday life. Using the actor-network theory and a qualitative research method, Thompson and Cupples (2008) evaluated mobile texting in a network of interdependent factors, including material components of mobile phones, socio-spatial relations, and mobile phone corporations, which they defined as "digital sociality" (p. 95). But despite the additional assistance provided by text messaging technologies in maintaining relationships, the very availability of the communication medium may actually be a stressor for some users of such technology, who may find themselves compromising time for other activities in support of relationship maintenance. Constant connectivity can sometimes compel or coerce responsiveness (Panek, 2014), and increased expectations of instant relationship maintenance from social connections can increase and pressure recipients to respond to messages (Hall & Baym, 2012).

Another way to address the nature of social connections through the texting medium is to view the medium and social connection through the lens of Media

Synchronicity Theory, (MST), which looks to use media synchronicity as a predictor of communications performance; the success of convergence processes is directly related to the synchronicity of the communication, whereas conveyance processes do not (Dennis et al., 2008). A study done in 2008 had mixed results in support of the MST theory: the task-technology fit (TTF) notion viewing instant messaging as a highly synchronous communications medium was not found to be effective for convergence communication (Hung et al., 2008). However, this study was directed solely at workplace communication using internal private instant messages between co-workers, primarily from personal computers, and did not involve personal use of mobile device text messaging. Personal text-messaging has role duality: data seems to suggest communication media such as text messaging and instant messaging can be used asynchronously as well as synchronously allowing the participant time to stop and reflect before giving a response if this is desired, or, alternatively, allow immediate response to the conversation if this is preferred. This gives participants greater control over interactions than they would have if, say, communicating via voice calls using a telephone or face-to-face, which are by their nature necessarily synchronous (Madell & Muncer, 2007).

Literature specific to research on text messaging, instant messaging and short message service (SMS), separate and in isolation from studies in conjunction with mobile phone usage or general internet usage in specific to social connections is a growing but diverse area, covering a scattered field of interest. Igarashi et al. (2008) described and documented dependency on texting technology and text messaging by Japanese high school students. A second work of this nature was a treatise on the importance of text

messaging in the college–aged population, noting it was an integral aspect of the culture of young people (Skierkowski & Wood, 2012).

As text messaging gained in popularity and became a more accepted form of interaction, achieving social legitimacy, the user community found an increasing number of uses for this medium (Ling, 2010). These can be roughly categorized into four general usage groups: business usage, emotional support usage, maintenance of relationships, and coordination of social activities, all with an overarching attribute of contact urgency.

The use of text messaging for businesses purposes, and social organizations employing text messaging technologies for various organizational and business functions have become increasingly common. Retail organizations and various service groups use text messaging to send coupons and sale notifications, bill reminders, appointment notifications, and information services such as weather, traffic, market rates, and headlines (Dickinger et al., 2004). Medical organizations use this technology for the purpose of appointment reminders and confirmations (Perron et al., 2013), to promote adherence to medical protocols (Nglazi et al., 2013), and to prevent the spread of disease through alert systems (Zurovac et al., 2012).

Additionally, studies have linked the use of text messaging to emotional support. Activities such as "'sending inspirational messages' and 'notes of encouragement to friends and loved ones'" (Barlow, 2008, p. 36) were noted, and in overcoming the challenges of identity and changing familial roles, adolescents have been shown to use text messaging to provide each other with emotional support and to give feedback to one another's social behavior and personality (Van Cleemput, 2008). Text messaging provides the ability and vehicle for friends and family to be able to provide emotional

support and opportunities to discuss problems (Brosch, 2008). Other research has shown the use of text messaging by participants for the purpose of reaching out to each other for social and emotional support (Ling, 2004), and to send quick notes "just to say I love you" and inform their close friends and family members of their whereabouts (Barlow, 2008, p. 36).

A third common use of the text messaging medium is relationship maintenance, the sustaining and supporting of social connections (Katz, 2008; Ling, 2004). The medium provides the ability to exchange moment-by-moment experiences with special partners, and to have a more continuous sense of connection with friends and lovers (Brosch, 2008). Skierkoski and Wood (2012) found participants fully understand the importance of texting in maintaining and promoting relationships with peers.

Text messaging is used quite often to schedule and coordinate life events. Some other studies examined the social coordination function of mobile texting, finding text messaging usage for coordinating times and places for meeting in person (Campbell & Kelley, 2006; Ling, 2004), arranging meetings and sending out confirmations (Ito & Okabe, 2005), and to orchestrate ad hoc scheduling such as last-minute additions to a shopping list to prevent repeated trips (Copeland-Welp, 2013).

Surrounding and influencing the four usage purposes; business usage, emotional support usage, maintenance of relationships, and coordination of social activities, is an overarching social sense of urgency. When a person receives a text message while interacting with others, they must decide whether to read the message and if so, decide whether or not to or respond to the message, thus interrupting their face-to-face social interaction, or they may choose to ignore the message, potentially offending the sender.

Responding may or may not lead to a conflict with current social mores in the context of the moment and may possibly be viewed in a negative way by the present face-to-face person or group. Previous research by Nickerson et al. (2008) indicates the sense of urgency to respond to text messages is influenced by several variables, such as their country of residence, setting context, and their age. Recent studies show that 95% of texts will be read within three minutes of being sent (Cohen-Sheffer, 2017), but it is unclear as to what factors determine how quickly a response will be forthcoming. However, with the rapid proliferation of the text messaging medium over the past 10 years across all generations, new research is indicated to determine if age continues to be an influencing factor in contact urgency.

Generational Groups

People's experiences as they pass through their formative years and their coming of age, the time of crucial and impressionable "generational imprinting" (Bartels & Jackman, 2014, p. 10). It is that period of a person's life distinguishing them from other persons in different times and social climates, when they become qualified to assume certain civil and personal rights, and to be expected to accept and assume certain responsibilities. Whether the members come of age during or after a period of national crisis, or during or after a period of cultural renewal or awakening can have a profound influence over the makeup of each generation (Howe & Strauss, 2007); understanding their generational differences is essential to understanding how and for what purpose they communicate with each other and with society. Although there are outliers and exceptions, and no individual completely fits the profile of a particular generation

(Rosen, 2011), as a collective each generation has its own set of beliefs, defined social and societal behaviors, and characteristics (Novak, 2012). Generations are among the most powerful forces in history (Howe & Strause, 2007). These different beliefs and attitudes are often quite pronounced, often leading to generational conflicts between various generations (Zemke et al., 2000). A sociological phenomenon originally identified by Karl Mannheim which came to be known as the "Generation Gap" (Mannheim, 1952), seems to occur between each succeeding generation and the previous generation, reinforcing within each generational group a strong sense of generational identity (Howe & Strause, 1992). Although there may be a perceived boundary problem in determining exactly where to delineate specific social generations in the "seamless continuum of daily births" (Spitzer, 1973, p. 1358), a review of the available literature (Novak, 2012; Zemke et al., 2000; Carrier et al., 2009; Kitch, 2003; Twenge, 2010; Twenge, 2014; Underwood, 2017), shows a fairly consistent breakdown and agreement of the most common boundaries for those born since 1901, allowing a consensus to be drawn of six distinct generational groups, with distinctive social attributes within each age division. Known by their common use labels, these are the GI Generation, Post-War Silent Generation, Baby Boomers, Generation X, Millennials, and Generation Z. A brief synopsis of these groups and their predominant characteristics as gathered by the prevailing literature is provided in the paragraphs that follow. The beginning and ending dates for each of the generational groups have been determined by taking the averages of the dates provided from all sources consulted, which at most varied by plus or minus three years.

The GI Generation

Also known as the Greatest Generation, those under this category were born between 1901 and 1927 and came of age during the Great Depression and during World War II. Many of their parents either fought in World War I (Novak, 2012), or escaped the European conflict by immigrating to the United States. As mentioned earlier as a delimitation, this generational group represents less than 1% of the currently living population of the United States (United States Census, 2017), and as such it will not be included as part of this study.

Post-War Silent Generation

Born between 1928 and 1945, in the time "just too late to be war heroes and just too early to be youthful free spirits" (Howe & Strauss, 2007, p. 4), this generation, also known as the Mature Post-War Generation, has had significant opportunities in employment and higher education as the post-war economic explosion struck in the United States. At the same time, they lived through times of increasing Cold War tensions, the potential for nuclear war, and the conflicts of the Korean and Vietnam Wars (Novak, 2012). Anxiety and uncertainty were prevalent throughout this generation. Members of this group tend to value security, comfort, and extreme conformity, preferring familiar and known activities and situations, but at the same time manifesting a strong patriotism, often transforming this strong nationalism into protectionist and jingoistic beliefs (Rosen, 2011; Underwood, 2017). They believe in discussion, inclusion, and process but often fall short of decisive action (Howe & Strauss, 2007). They are avid readers, especially newspapers (Novak, 2012), and have a strong sense of common values transcending generations, holding near-absolute truths (Rosen, 2011;

Novak, 2012). During their employment years, they have been dedicated, respectful, and faithful to the leadership hierarchy (Zemke et al., 2000). They are generally loyal to their employer - a job is something you generally keep for life (Novak, 2012). They can be disciplined, conformists (Novak, 2012; Zemke et al., 2000), self-sacrificing (Rosen 2011; Zemke et al., 2000), and cautious (Novak, 2012; Zemke et al., 2000), but at the same time willing to explore new experiences such as the suburbs, television, and the transition from big band / swing music into the new musical experience of rock and roll (Novak, 2012). This group can be disinclined to adopt new technologies unless they are convinced this technology is important to them personally or professionally, opting not to adopt technology just for technology's sake.

Baby Boomers

The Baby Boomers, also known as the Hippies, the Lost in Space Generation, later as the Yuppies, Generation Jones, and the "Me" Generation, were born between 1946 and 1965 and can be divided into two distinct subgroups. The first subgroup, whose members were born roughly between 1946 and 1954, are often referred to as the Boomer I group, experiencing in their formative years the protesting of the Vietnam War (Novak, 2012), increased discontent with the status quo, and the assassinations of John Kennedy, Robert Kennedy, and Dr. Martin Luther King (Kitch, 2003). They ushered in the free love and societal non-violent protests which ultimately initiated violence (Novak, 2012). They are known for strong desires to make their own rules, to change the accepted mores and societal values for the good of all (Kitch, 2003; Howe & Strauss, 2007; Novak, 2012). They are the first true TV generation (Novak, 2012), and the first divorce generation as well, where divorce was starting to be more socially accepted, as

were alternative lifestyles such as homosexuality (Novak, 2012). Women began working outside the home in increasing numbers, challenging the glass ceiling in the workplace (Howe & Strauss, 2007) and the first generation to have children raised in a two-income household, where the mother was not ever-present. (Novak, 2012).

The second subgroup, whose members include those born roughly between 1955 and 1965, are often referred to as the Boomer II, the Yuppies, or Generation Jones. They tend to be optimistic, driven, team-oriented career climbers, the "me" generation (Kitch, 2003; Novak, 2012; Zemke et al., 2000). They tend to be somewhat self-righteous self-centered, and self-conscious (Kitch, 2003) and find delayed gratification difficult; they want consumer goods (Rosen, 2011), want them now, and will use credit to get them (Novak, 2012). They tend to be more positive about authority, hierarchal structure and tradition (Zemke et al., 2000). They see technology and innovation as requiring a learning process but are not reluctant to embrace education when they feel it is needed (Rosen, 2011). Some members of this generation were introduced to computers in their high schools, through remote access to college mainframes, remote terminal access to time-sharing systems, or via Apple 1 PCs (Zemke et al., 2000).

The Boomers, I and II, as a group represent one of the largest generations in history with 77 million people (United States Census, 2017). They are the first generation to embrace retirement as a time to enjoy life after the children have left home (Novak, 2012). They exercise, travel, and take up hobbies and second careers, and stay mentally and physically active, which has been linked to an increase in their longevity (Novak, 2012). Their activism and social consciousness, initially dormant for many

years, is beginning to re-emerge (Novak, 2012). The sheer size of this group has necessitated competition and a strong focus on work.

Generation X

Born between 1966 and 1978, members of this group are sometimes referred to as the Lost Generation, or the Latchkey Generation. Growing up an era of failing and ailing schools, deteriorating marriages, and an overall decrease in the general welfare of children (Howe & Strauss, 2007), they have a strong distrust of institutions. They tend to be entrepreneurial but government and big business mean little to them (Novak, 2012). Theirs was the first generation of latchkey kids, experiencing regular daycare by a paid non-family member, and an increasing number have had parents who were divorced (Novak, 2012). They have had the lowest voting participation rate of any generation and seem to have little interest in following the news or current social issues around them (Kitch, 2003). As many came from homes with divorced or career-driven parents, they often grew up independent but isolated, with a reluctance for commitment (Zemke et al., 2000). They are often homebodies, loyal to their local neighborhood and community but not to the rest of the world (Novak, 2012). They tend to be initially short on loyalty; skeptical and wary of commitment (Novak, 2012; Zemke et al., 2000), and often marry later in life, after cohabitation. Many of them have constructed the strong families they missed in childhood (Howe & Strauss, 2007), but although dedicated and willing to making marriage work and to be always available for their children, they are often quick to divorce (Novak, 2012).

They are the first generation to have been regularly introduced to computers in their middle and high schools (Novak, 2012). They like to learn, to explore, and to make

a contribution (Kitch, 2003; Novak, 2012). They are self-committed but tend to be informal in their approach to most things, such as apparel, communication, and basic rules and tenets. A very flexible group, they have a love of efficiency, which is directly tied to their results-oriented integration of technology in their lives. They have high employment turnover, averaging seven career changes in their lifetime (Novak, 2012), and have a free agency perspective, with strong desires to be their own boss (Howe & Strauss, 2007). They are brand-name conscious, with little desire for delayed gratification; most are deeply in credit card debt (Novak, 2012). They are wary, distrustful, apathetic towards authority, and resourceful, self-confident (Kitch, 2003; Novak, 2012).

Millennials

Also known as Generation Y, the Net Generation, the 9/11 Generation or The Echo Boomers (due to being the offspring of the Baby Boomer generation), this generation was born between 1979 and 1995. Reaching their formative years during times of decreasing crime rates and falling teen pregnancy rates (Novak, 2012), they have a stronger sense of respect for authority and sense of duty than the previous generation (Kitch, 2003; Novak, 2012). They are often supported by so-called helicopter parents, omnipresent mothers and fathers taking an overprotective or excessive interest in the life of their child or children (Novak, 2012) and often lean towards optimism and hope (Zemke et al., 2000). They are focused, determined, somewhat regimented, scheduling everything, and self-apply massive academic pressure, optimistically ambitious, setting lofty goals and high expectations for themselves (Kitch, 2003; Novak, 2012; Zemke et al., 2000). Unlike the previous generations, members of this generation grew up with

available computer-based technology in schools and at home (Carrier et al., 2009). Their social worlds include not only physical locations, but also online worlds and systems. Having grown up in a digital environment, they prefer digital content over traditional media, and are much less likely to retain collections of written media (Carrier et al., 2009; Novak, 2012). They get the vast majority of their information and socialization from the Internet (Novak, 2012). They are flexible and changing in their fashions, their style consciousness and where and how they communicate (Carrier et al., 2009). With unlimited access to information they tend to be assertive with strong views (Schwieger & Ladwig, 2013; Novak, 2012). They do not live to work, preferring a more relaxed work environment with frequent accolades, and a team environment where leaders and team members pull together (Schwieger & Ladwig, 2013; Zemke et al., 2000), but with individual recognition and accolades (Novak, 2012).

Technology is second nature to them. Associated with the expanse of technology-based media in the home for this generation is an ever-growing need and skill at multitasking (Carrier et al., 2009; Schwieger & Ladwig, 2013). It is normal for them to have many windows open on their computers at the same time, to check messages in meetings on portable devices, to send email while on the phone, and to exchange texts at all times and places. This generation has described this multitasking environment as a "way of life", stating it (multitasking) is "easy" (Rosen, 2007, p. 20). Having grown up during and after major technology booms, they are technology-assisted communicators, completely integrated with and immersed into technology. They have a difficult time imagining how earlier generations got along without it, or how to do some tasks without the assistance of technology.

Generation Z

Also known as the Post-Millennials, the iGeneration, The Homeland Generation, or the Boomlets, this is the demographic cohort following the Millennials, persons born in 1996 or later. This generation has to date no suggested definitive end date for the generational group; no subsequent group designation has yet occurred. While there is as yet not sufficient definitive data concerning the social aspects of Generation Z, much is known with regard to the environment in which they are growing up. A majority have televisions in their rooms, and most have video games and various other hand-held electronic devices such as video games and tablets (Novak, 2012). They have never known a world without computers, cell phones, or the Internet. This generation has always had and expected to be able to use the Internet, from a very young age. They anticipate and expect connectivity and seem bewildered if connectivity to the Internet is not present. As members of this group reach the age of four and five, they become less concerned with traditional toys, with an increasing desire for electronics such as cell phones, iPads and video games (Novak, 2012). Very comfortable with technology, they interact on social media websites and social media systems for a significant portion of their socializing; it is unusual to see a member of this group without a mobile device (Lai & Hong, 2014). For this generation, "the smartphone, the Internet, and everything technological are not tools at all—they simply are… Their WWW doesn't stand for World Wide Web; it stands for Whatever, Whenever, Wherever" (Rosen, 2011, p. 1). This constantly connected environment allows for instant gratification and immediate frustration if answers are not clear immediately (Shatto & Erwin, 2016). And although a recent study found this generation may be overly tired of the constant immersion in social

media systems with some members beginning to take breaks from social media platforms such as Facebook, Snapchat, and Instagram, it was not indicated whether this had an effect on their level of participation in text-messaging (Ortutay, 2017).

Generation Z is a much more diverse generation than any previous generational group (Shatto & Erwin, 2016); in their time biracial and multiracial children have become the fastest growing population in the United States. More than any of the current generations, Generation Z students learn by observation and practice, not by reading and listening to presentations, and tend to be more conservative than the previous generation (Pew Research Center, 2014). This generational group has less religious identification than all previous generations: in 1966, 6.6% of incoming freshman reported being unaffiliated with any religion, but in 2015, nearly one-third (29.6%) of all incoming college students reported not identifying with any particular religion (Eagan et al., 2016).

Looking forward, higher levels of technology will make them more likely to be the catalyst for significant improvements in academics, with support for customized instruction and data mining of student histories to enable targeted instruction for both acceleration and remediation (Josuweit, 2018). It is anticipated they will be well informed consumers who will know what they want and how to get it.

In reviewing the traits of the various generational groups each generation clearly has its own beliefs, characteristics, social and societal behaviors, and characteristics distinguishing them from the other generations (Novak, 2012). Table 1 provides a summary of these generations, their age ranges, their general observed traits, as well as the major coming of age events that occurred for that generation.

Table 1. Generational Groups and General Characteristics

Generation Name	Birth Range	Coming of Age	General Traits
Post-War Silent Generation *(aka the Mature Post-War Generation)*	**1928 – 1945**	During Cold War, Korea, Space Race and at the upper range, the onset of the Viet Nam War	Conformists Sense of community Security minded Cautious Patriotic
Baby Boomers BB-1, (*aka Hippies, Lost in Space Generation*) BB-2, (*aka Yuppies, Generation Jones, "Me" Generation)*	**1946 – 1965** 1946-1954 1955-1965	Two subgroups 1) During height of the Viet Nam War, Watergate, and the Peace movements 2) During Deregulation, Economic recovery, Deficit spending, and Reaganomics	Social activists Liberal TV generation Divorce becomes norm Rock and Roll Skeptical Self-centered
Generation X (*aka Lost Generation, Latchkey Generation)*	**1966 – 1978**	During economic and technology boom, and the onset of the Internet, digital technology becomes ubiquitous	Detached from politics Job-jumpers Self-sufficient Instant gratification Homebodies
Millennials, (*aka Generation Y, 9/11 Generation, Echo Boomers)*	**1979 – 1995**	During times of falling crime rates, falling teen pregnancy rates, internet & cell phone ubiquity, and social networking proliferation	Optimistic, focused, Tech savvy Regimented Digitally literate Informed
Generation Z (aka *Post-Millennials, iGeneration, Boomlets, Homeland Generation)*	**1996 and beyond**	During times of extreme political discord, the Great Recession, high student debt, and an integrated digital presence	Conservative Disenchanted Money oriented Risk averse Education Bound

Text Messaging and Technology

The increase in the demand for mobile mass communication technologies helped to foster the evolution of increasingly advanced mobile phone devices, or smartphones, during the last decade. Smartphones facilitate improved real-time communications and leverage the increased power of social media and collaboration technologies, impacting numerous aspects of participants' daily lives socially and ethically (Shneiderman et al., 2017), as well as the way business is conducted (Siau & Shen, 2003). Smartphones have innumerable applications allowing them to operate well beyond the functionality of a mobile phone: they store and play music, movies, and television shows, allow the exchange of text messages, have built-in cameras, video recorders, global positioning systems, and a myriad of other applications. They are essentially hand-hand portable computers that also make phone calls. The proliferation of technology supporting the portability and immediacy of connectivity to the Internet and applications, particularly those designed for social networking on mobile devices is growing exponentially worldwide. As of October 2014, ownership of smart phones among American adults exceeded 90% of the population, and of those using such devices, 81% use them to send or receive text messages (Duggan, 2014). Smart phones and smart devices become not only ubiquitous, but indispensable. An April 2015 Pew research study revealed nearly half (46%) of smart phone users indicated their smart phone is "something that they couldn't live without" (Smith, 2015, p. 7).

Of particular interest for this study is the specific Computer Mediated Communication (CMC) technology of text messaging, which has become an extremely popular form of communication. In addition to allowing e-mail and various other services, the most popular use of smartphones, with 97% of all smartphone users

participating, is to use the device for texting (Smith, 2015), the sending and receiving of text messages using the Short Message Service (SMS), or other texting application to send and receive texts, digital pictures, and audio or video content using Multimedia Messaging Service (MMS) (Anderson, 2015). According to the latest data from the Pew Research Center's Internet and American Life Project, nearly all (97%) of young adult cell phone users, ages 18 to 24, engage in text messaging on their cell phones at a rate of nearly 110 messages per day or 3,200 per month (Smith, 2011). However, texting is not only the domain of the young. Usage percentages are above 90% for all age categories (Pew Research, 2015). These text messaging technologies have changed interpersonal interactions drastically by enabling more text-based and non-verbal communications in place of face-to-face transactions. It empowers consumers to feel increasingly knowledgeable about things related to their friends, family members, social issues, and surrounding news (Harrison & Gilmore, 2012). Research into the number of times a person exchanges text messages per day has been done by several services (Pew 2017), Experian Marketing Services (2013), Twilio (2018), but the age range groupings do not correspond to the five known generational group age ranges.

The ubiquitous nature of text messaging technologies provides an expedient and convenient way of communication, and as it has proliferated, the volume of scholarly research has grown as well. Early research for the most part trends towards viewing and addressing all social media as a whole. The 2005 research of Bianchi and Phillips does include text messaging in the overall mix of media subject to abusive behavior but does not study text messaging specifically or separately. Reid and Reid (2007), Butt and Phillips (2008); Ehrenberg et al. (2008), Toda et al. (2008), Leung (2008), and Lapointe

et al. (2013) all follow this same model; measuring and comparing various social media preferences including text messaging in the context of personality types, addictive tendencies, and behavior. Clinicians were still viewing text messaging in the same framework as Facebook and other social media (O'Keeffe & Clarke-Pearson, 2011), while others were viewing texting and calling as "classic mobile applications" and were not being considered in the same view as other social media (Salehan and Negahban, 2013, p. 2635). Still others looked at the device itself when incorporating the various communications media in examining dependence, addiction, and relationship maintenance (Hall & Baym, 2012; Harwood et al., 2014; Lee et al., 2014).

In reviewing the existing research on the various technologies available for communication, multiple studies have indicated text messaging is the preferred form of contact, as compared to e-mail, mobile phone communication, or social media services such as Facebook (Madell & Muncer, 2007; Mahatanankoon & O'Sullivan, 2008; Reid & Reid, 2007). Possible reasons for texting having preference over other communications media may be related to the social relationship and hierarchy between the participants. One study determined the patterns of usage across the various media could be placed on a single dimensional scale, indicating a media hierarchy; close friends and peers were primary users of text messaging, but used all communication media at their disposal to connect with each other, while minor acquaintances and classmates preferred face-to-face communication and social network sites (Van Cleemput, 2010). In an earlier 2007 study, comparing text messaging usage to talking to each other using mobile phones, Madell and Muncer found talking was used primarily for lengthy conversations with peers about major life events and seemingly important issues, or for conversations with their parents.

In selecting employment status, education level and gender as moderators, it was found that although gender and education level are often reviewed as moderators with regard to text messaging, employment status was not. Several non-generalizable studies reviewing the effect of various moderators have found that both education levels and gender were shown to have a significant moderating effect on a person's attitude toward utilizing mobile technology devices (Park et al., 2007) and mobile text messaging of Chinese mobile users (Deng et al., 2010). Additionally, it was found that gender moderates the relationship between attachment avoidance and the sending of sexually explicit "sexting" messages (Drouin & Landgraff, 2011). However, there were no studies found specifically addressing the moderating effect of employment status on text message usage and habits. Further research into employment status, education level and gender as moderators is therefore supported.

Summary

The review of literature indicated people's strong desire for social connections (Valenzuela et al., 2009) and their continued reliance on technology mediated communication (TMC), and computer mediated communication (CMC) to support social communications. Text message messaging was identified as the medium of choice for multiple ages and genders for relationship formation and continued support of relationships, for business usage, and for coordinating social activities. Age was found to be a factor influencing the urgency with which a participant responds to text messages, but this was found to be moderated by the country of the participant as well as the asynchronous or synchronous nature of the specific text communication (Nickerson et al.,

2008), warranting additional research. The literature review further demonstrated that generational group membership in the five generations investigated in this study (the Post-War Silent Generation, Baby Boomers, Generation X, Millennials, and Generation Z) had strong influence on defining an individual's social and societal behaviors, and characteristics (Novak, 2012), and their willingness to embrace technology.

It was also discovered that in the past decade, smart phones which support the text messaging medium have become ubiquitous; over 90% of the population owns or has access to a smart device, and over 80% use those devices to send or receive text messages. As this was not the case a decade ago, many studies of usage by various demographics are now somewhat outdated, suggesting that newer research be pursued representing the current state of the medium's usage.

Chapter 3

Methodology

Overview

This section defines the elements of the research design and describes the methods used to conduct the study. First, the basis for the specific theory used is discussed. This is followed with a detailed description of the research approach and methods employed, and a summation of the specific steps taken.

Theoretical Model

To address the somewhat sparse representation of valid theory-based research in this area, a framework in which to conduct research was defined. It was tempting to use a social capital framework, in which the participants are said to be motivated by engaging others in order to obtain resources to achieve better outcomes, that is, social capital theory highlights the importance of using social connections and social relations in achieving goals (Lin, 2001). However, research has shown younger people who embrace short message service (SMS) or other text messaging service to stay in touch and to extend their social circle have a lower probability of having face-to-face visits with family, neighbors or friends in one's home (McPherson, 2008). The social aspect is diminished; although social capital theory may be a strong contributor, it is in and of itself an insufficient theoretical framework in which to conduct this study.

To examine questions of how, why and to what extent individuals and group members use social media, specifically text messaging, to satisfy particular social needs, the uses and gratifications theory (U & G) can be applied as a successful theoretical framework (Flanagin, 2005; Quan-Haase & Young, 2010; Waldeck & Dougherty, 2012). Originally developed to examine traditional media (Katz, 1974), such as newspapers and television (Kippax & Murray, 1980; Rubin, 1983), U & G theory can be applied to current media, as indicated by research in which instant messaging or the Internet was the studied medium (Flanagin, 2005). This theory is further supported and amplified by media dependency theory (DeFleur & Ball-Rokeach, 1982): media influence is determined by the relationships between the media, its audience, and society.

The use of a medium is positively associated with derived gratification-utility. For example, a review by Palmgreen et al. in 1985 found 20 studies in which gratification-utilities were associated with frequency of exposure and choice of both content and medium. The individual's desire for information from the media is the primary variable in explaining why media messages have cognitive, affective, or variable effects. Dependency on the medium is higher when satisfaction of an individual's goals relies upon on information from the media system (Ball-Rokeach, 1985). More recent studies have linked gratification-utility with frequency of use of interactive media. Dimmick et al. (1996) found a substantial association between gratification-utilities and the usage rate of the telephone. Leung (2001) used 26 gratification-utility items grouped into seven factors which, as a block, explained 10% percent of the variance in the frequency of use of instant messaging in a sample of college students.

Research Methods Employed

This study employed a mixed methods research design to examine a variety of qualitative and quantitative data, to examine both the text-message usage habits and the motivations of the participants in the maintenance of their social network connections. A mixed methods approach (Creswell, 2013; Teddlie & Tashakorie, 2010) seemed most pertinent for addressing the research goals. Mixed methods provide methodological triangulation (Teddlie & Tashakorie, 2010; Patton, 2005), leading to stronger inferences. Text messages, albeit simple in format and structure, can be complex in purpose and meaning. Mixed methods provide a more comprehensive understanding from different data source types and can help to make valid inferences from the substantial amount of data collected (Sekaran & Bougie 2013). The mixed methods design strategy employed was *sequential explanatory,* characterized by the collection and analysis of quantitative data followed by a collection and analysis of qualitative data. The quantitative results are then used to help drive the qualitative narrative, and the qualitative results assist in explaining and interpreting the findings of the quantitative study (Creswell, 2013).

Quantitative Method

The quantitative portion of the research compared the text messaging habits of adults within generational groups to determine what role texting plays in the communication patterns of each generation, and to examine the sociological impact of text messaging on the survey respondents. The data gathered from this step shaped the qualitative portion of the study, which examined themes and patterns among the generational groups and assisted in responding to the fifth research question.

Sample Development

The target population of interest, as indicated above, was all adult users of mobile devices utilizing a text-messaging service. In determining the best sample size in order to accurately and adequately represent the population at large, it was determined a positive response of 384 or more participants would be needed using the formula established by the seminal work of Krejcie and Morgan in their 1970 research on determining sample size when the population exceeds 1 million. However, the group membership percentages of the five generational groups is disproportionate; population percentages are not the same for each generational group. Using the approximate population by age for 2016 data from the United States Census Department, percentages for each generational group were calculated (United States Census, 2017). These percentages were applied to the minimum 384 participants to determine the minimal sample size, rounding up to the nearest whole number, for each generational group. The conclusion was the minimum number to be surveyed was as follows: Post-War Silent Generation, 30; Baby Boomers, 92; Generation X, 64; Millennials, 96; and Generation Z, 104, which would indicate a minimum overall minimum sample size of 386 participants, comprised of the representative numbers within each group.

A web-based survey was sent initially to students at Hodges University, an ethnically and generationally diverse private university, where the researcher acts in an adjunct capacity. This institution, in the southeastern United States, is accredited by the Southern Association of Colleges and Schools, with a total population of approximately 3,600 students and 120 faculty members. It caters to the adult learner, with an average student age of 32, as follows: 22% under the age of 24, 42% between the ages of 24-34,

23% between the ages of 35-45, and 13% at age 46 or older (Hodges, 2016). All students live off campus, many proximate to the Gulf of Mexico, but with a strong distance learning program the institution draws students from around the globe. Recognizing this pool may not provide a significant number of participants in the various generational categories, or be representative of the population, additional participants were solicited.

To ensure a sufficiently large sample size across generational boundaries, three additional sources of data were utilized. First, snowball sampling was used with the initial participants, who were encouraged and directed to share the survey link with various peers and family members - adult friends or relatives, parents, siblings, children over 18 and over, grandparents, and other members of their extended families, and to invite them to participate in the text messaging survey. As with the initial survey pool, no names or other uniquely identifying demographics were gathered. Secondly and concurrent with the collegiate survey, the researcher sent the survey to his current LinkedIn contacts, approximately 550 persons, to respond to directly, and as with the initial survey, were encouraged to share the survey link with their contacts, peers, and family members. After several weeks it became evident that only 65% of the sample size was realized, leading to the employment of the professional survey service, Survey Monkey, to supplement the data sample.

Initially, the Office of Institutional Effectiveness (IE) of Hodges University agreed to post an online announcement to all students via the learning management system (LMS). Since all classes, both traditional and online use the LMS, this had the potential to reach all students, as well as some faculty and staff members. However, after further discussion with the IE representative, it was decided to allow the researcher to

implement a direct e-mailing of the survey to the 3,600 members of the student body. In agreement with the established protocol at the subject university, all participants were surveyed under full compliance of the Office of Institutional Effectiveness of Hodges University and the Institutional Review Board (IRB) of Nova Southeastern University. The participants were provided with a detailed explanation of the research and the assurance of anonymity. The participants were apprised of their ability to discontinue and withdraw at any time.

Special care was taken to ensure all surveys were confidential with no identifying personal information. The concerns of the power dynamic which can occur when the subject is known to the researcher (Kvale & Brinkmann, 2009) was mitigated by not directly soliciting any current student of the researcher, and by ensuring the anonymity of the participants. The interview protocol consisted of a 28-question web survey instrument, shown in Appendix A, to gather the necessary data. In addition to the specific research questions, the data analysis examined various connections among the variables to determine if there were any covariate relationships.

Hypotheses and Model

The research investigated the existence of a correlation between a text messaging user's generational group and their text messaging usage habits. These habits were measured by the volume of messages sent and received (UV), the choice of text messaging partners (TMPC) for sending and receiving text messages, and the social purposes and urgency of those messages (SH). Further examination investigated to what extent, if any, their gender, education level, and employment status modified the usage

habits. To address the research questions and gaps found in the literature, a theoretical model was used based on the following hypotheses:

H1, an individual's text messaging usage habits and their generational group membership are significantly related.

H2, an individual's text messaging usage habits and their generational group membership are significantly related when controlling for gender.

H3, an individual's text messaging usage habits and their generational group membership are significantly related when controlling for employment.

H4, an individual's text messaging usage habits and their generational group membership are significantly related when controlling for education level.

The model for these hypotheses is illustrated in Figure 1.

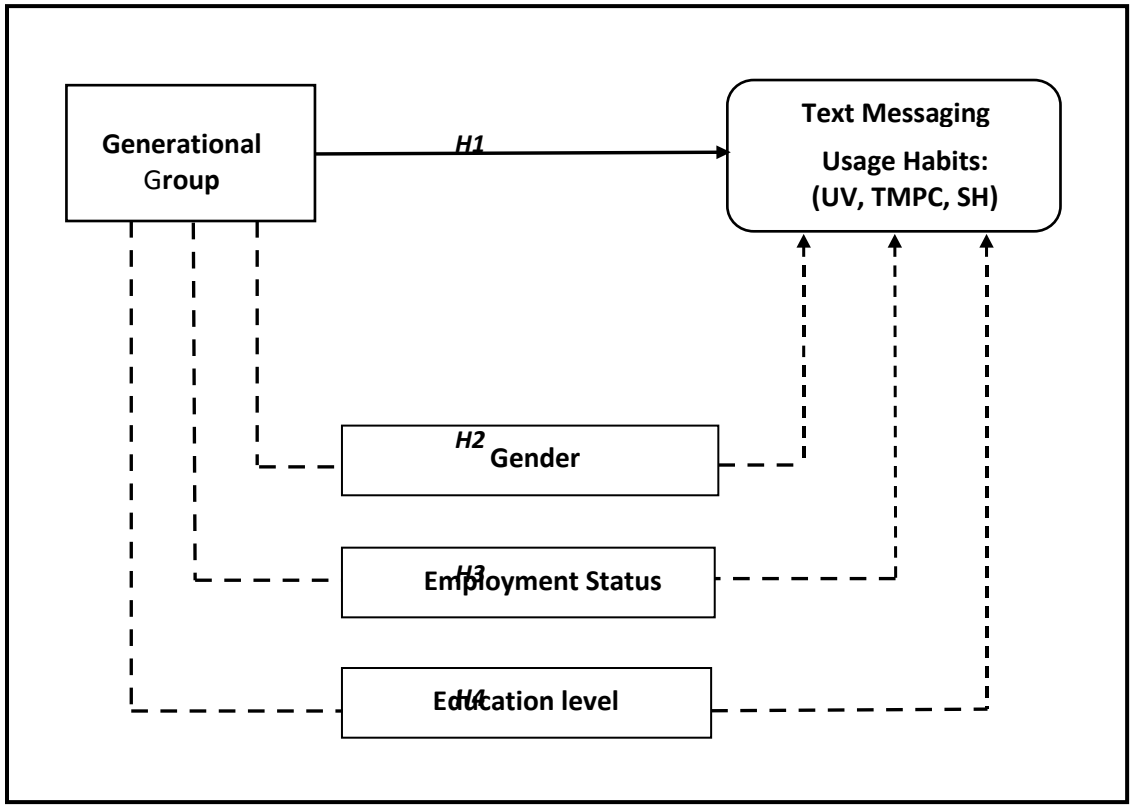

Figure 1. Model of Generational Group Correlation to Text Messaging Usage Habits

Instrument Development and Validation

Establishing the construct validity of a scale/test is a process of collecting evidence about what the scale measures. Specifically, construct validity is typically evaluated by looking at the patterns of correlations of the scale in question with a variety of other measures. Correlations with some measures provide convergent evidence (i.e., what it is measuring) while others provide discriminant evidence (i.e., what it is not measuring). Initial validation of the survey questions is primarily supported by the existences of prior similar validated research, or in the case of demographic questions, conformity to standard quantitative methodology for stratification of the data.

Secondary validation was performed by forming an expert panel to review the initial instrument and identify ambiguous or poorly worded items prior to pilot testing and to endorse the soundness and appropriateness of the questions to provide data suited to answering the research questions. To qualify as experts, the panelists had terminal degrees in the field of the study of Human Computer Interaction or Information Technology or had a minimum of five years as a practitioner or educator in these disciplines (Ericsson, 1996). The method to reach consensus in this panel used was the Delphi approach in which a collection of a group's subjective judgments and human intelligence is used to provide a solution to a specific problem (Adler & Ziglio, 1996; Linstone & Turoff, 2011; Goldman et al., 2008; Yousuf, 2007). As extant literature indicates panel performance improvement is minimal beyond five participants (Rowe & Wright, 1999; Shirazi, 2009), the panel of experts engaged was limited to five contributing members.

The quantitative section consisted of four types of questions: Qualifiers, Usage Estimates, Text Messaging Social Habits, and Demographics. Qualifiers were used to determine if a particular individual met the criteria for participation; as such it was not necessary to create nor validate a construct for this data element. Questions asked to gather self-estimations of usage may in of themselves be considered unreliable, as individuals may underestimate or overestimate their frequency of usage or may simply not accurately recall their own usage numbers. However, as these estimates were used only as comparators to ascertain usage counts relative to the usage counts of other participants, rather than specific numbers, the reliability of an individual count not identified as an outlier was not at issue.

Qualifiers - Questions 1 and 2 were used to eliminate survey participants who did not meet the primary qualifications for consideration in this study: 1) participants must have been cellular phones users and must have used said phone to participate in text messaging, and 2) participants must be between the ages of 18-90 at the time they completed the survey.

Usage Volume Estimates (UV) - Questions 3 and 4 ascertained the participant's self-estimation of their text messaging volume. Self-estimates of individual frequency of usage have been gathered in several prior related studies (Dimmick, Ramirez & Wang, 2007; Flanagin, 2005; Forgays, Hyman & Schreiber, 2013). These were later aggregated to get an estimate of usage frequency (UV) across the generational groups.

Text Messaging Partner Choices (TMPC) - Questions 5 and 6 gathered data on the principal targets and partners for which the participant perceives they participate in text messaging exchanges. These are based upon similar instrumentation in previous

research: Forgays, Hymnam, and Schrieber (2013) analyzed gender and age differences, creating measures categorizing contact and frequency among friends, and romantic partners across gender and age. These were used to be able to compare text messaging partner choices (TMPC) across the generations.

Text Messaging Social Habits (SH) - Questions 7-23 were social usage and behavioral questions, using a 5-point Likert scale, to measure the participant's self-perception of usage habits of themselves and of others. These questions were extracted or extrapolated from existing validated instrumentation from the Text Message Dependency Scale (a 30-item Likert scale developed by Igarash in 2008), from the SMS Problem Use Diagnostic Questionnaire (a 20 item Likert scale presented by Toda et al. in 2004), from the Text Messaging Gratification Scale (a 47 item Likert scale presented by Grellhesl and Punyanunt-Carter in 2012), from survey questions found in cross-cultural analysis of mobile phone use by university students done by Baron and Campbell in 2010, and from questions posed as part of the survey instrumentation by Xia (2012). In this study, Xia examined texting usage perceptions and their purposes as support for social interactions within the cultural norms through mobile texting in a two-instrument survey.

Demographics - Questions 24-28 were demographic categorization questions, gathering information on the participant's generational group, gender, employment status, occupation, and education level. Participants were given the option of not answering any or all of these questions. It should be noted that question 24, which asked the participants to state the year they were born, also acted as a qualifier; any participant that left this blank, entered an invalid answer, or entered years before 1928 or after 1999 were

eliminated from the data sample, with the exception of three individuals who had turned 18 just prior to taking the survey, having birth years of 2000.

Pilot Study

A pilot study was conducted using a small sample of seven users to ensure the validity of the survey instrumentation. Participants were selected on a convenience basis from the researcher's peer groups, and initially validated an electronic copy of the survey in portable document format (PDF) format via e-mail. After receiving no negative feedback on the form, the survey was entered into Google Forms, and a link to the survey was sent to the pilot group again via e-mail. This phase ensured the instrument not only had only construct validity, but had internal and external reliability, as well. Sekaran and Bougie (2013) defined construct validity as "how well the results obtained from the use of the measure fit the theories around which the test is designed" (p. 364). Once the reliability and validity were confirmed, the survey was adapted to a Web-based delivery format, and deliverable to the participant pool via e-mail. Participants provided feedback which validated the survey's usability and functionally across multiple browsers on desktop, laptop, and hand-held devices.

Pre-Analysis Data Screening

To collect the data, a web-based survey vehicle was employed which greatly enhanced the collected data quality and minimized inaccuracies associated with data entry (Cooper & Schindler, 2006). The edit and data range validation tools imbedded with web-based survey vehicles eliminated transcription errors, validated a majority of the response values, ensured completion of critical data elements to prevent any missing and required data, and provided a strongly and substantially pre-formatted dataset. This

greatly reduced the possibility of data irregularities, and substantially reduced mechanical efforts required to put the data into a workable form.

Pre-analysis data screening was performed to ensure consistency and accuracy of data and to ensure the validity of the results (Mertler & Vannatta, 2010). This was necessary to detect and address any data irregularities or issues with the gathered raw data (Levy, 2006). There are four fundamental reasons for performing pre-analysis data screening prior to the full data analysis: 1) to ensure accuracy of the data collected; 2) to deal with the issue of response set or response bias; 3) to deal with missing data; and 4) to deal with extreme cases, or outliers (Mertler &Vannatta, 2010). Ensuring accuracy of the data collected required certifying that all responses were valid - requiring all items to be completed and limiting item responses to only those that were valid for the specific question, thereby eliminating the historical errors associated with collecting and recording responses using traditional, paper-based surveys.

Bias can also occur when responses vary in a systematic fashion due to the use of a common scaling approach on measures, derivative of a single data source. Commonly known as Common Method Bias (CMB) or Common Method Variance (CMV) (Podsakoff et al, 2003), occurs when the research's methodology relevantly, to some extent distorts casual effects. When there is a significant variance between the observed relationships and the actual relationships, CMV biased the data (Ostroff, Kinicki, & Clark, 2002). However, more recent studies have shown CMV, should it even exist, "may not produce changes in effect sizes and significance levels, may change them trivially, or may change them in an amount that is practically meaningless" (Fuller et al., 2016, p. 2). Analysis only addressing CMV is of limited value, as CMV presents

considerable potential for upward bias in relationships only when CMV approaches 70% or more…reports of CMV in this range are the exception rather than the rule (Sharma et al., 2009). All responses were inspected, with incomplete, or opt-out responses removed before final analysis. This set of data, in spreadsheet form, was input to IBM's Statistical Package for the Social Sciences® (SPSS) to continue pre-screening.

Those participants who indicated an interest in seeing the final analysis of the data were advised to request this information by sending an e-mail to a separate e-mail address provided by the researcher. As this will be a separate communication than the web survey to a separate e-mail account, this may identify that an individual did participate, but the anonymity of the participants will be maintained to the extent that a specific individual's data contribution and survey answers will not be able to be linked back to that individual, nor are all e-mail addresses based upon an individual's name or other identifying criteria.

Quantitative Data Analysis

After pre-screening was completed, Microsoft's Excel 2016 and IBM's SPSS were used to continue the data analysis. A score was created for each respondent using the aggregate of the component scores from the 5-point Likert scale for each of the five usage habit factors. This was used to represent a particular trait to create a chart of the distribution of findings across the sample. Additional analysis was provided by performing univariate and multivariate analyses to determine whether there were any statistically significant differences between the means of two or more independent variables, of usage habits by generational group for each of the constructs, to show

whether or not the sample variances differ from each other or appear to be from the same population (Sekaran & Bougie, 2013).

To address whether or not the generational group influence was modified by other variables, univariate and multivariate analysis with the inclusion of a covariate were used to compare two or more groups while also being able to control for a variable to determine what, if any influence it might have on the dependent variable. (Mertler & Vannatta, 2010). These tests were done using the gender, employment status, and education level variables as covariates within the context of the generational groups, examined for their effect, if any, on text messaging usage habits.

As the error rate for Type I errors for a series of comparisons is greater than the error rate for a single comparison, the incidence of such errors must be addressed. Two tests frequently used are Tukey and Scheffé. Tukey's method, although resulting in a much narrower confidence interval for between group pairwise comparisons, should not be applied in this analysis, as the sample sizes were different (Tukey, 1977). The Scheffé test, which can accommodate unequal sample sizes, was therefore used to analyze pairs of means to see if there were any differences. It differs from Tukey in that it applies to the set of estimates of all possible contrasts among the factor level means. In the case where many or all contrasts might be of interest, the Scheffé method tends to give narrower confidence limits (Scheffé, 1953), and is the preferred method.

Using the four categories discussed previously (Business Usage, Emotional Support Usage, Relationship Maintenance Usage, and Event Coordination Usage) and gathering additional data to attempt to measure the participants' sense of temporal insistence (Contact Urgency), the survey questions used to ascertain usage habits were grouped into five constructs for further analysis. These constructs represent support of

text messaging for business usage, (BUS) emotional usage (EMS), relationship maintenance (RMS), event coordination (EVS) and contact urgency (CUS). These were examined with various statistical tests to determine if there were any strong correlations among the constructs.

Internal consistency reliability was first ascertained to ensure validity, to measure whether several items proposing to measure the same general construct produce similar scores (Henson, 2001) before other tests were employed for research or examination purposes. In addition, reliability estimates showed the amount of measurement error in a test. Put simply, this interpretation of reliability is the correlation of test with itself. Cronbach's alpha was used to provide a measure of the internal consistency of the category groupings. Internal consistency describes the extent to which all the items in a test measure the same concept or construct: it is connected to the inter-relatedness of the items within the test (Cronbach, 1951). Table 2 shows the questions, constructs and the groups to which the constructs belong. The format and categories are somewhat derivative of a similar table (Xia, 2012). These five social habit constructs (SH) along with the data gathered for usage volume (UV) and text messaging partner choices (TMPC) constitute the participants' text messaging usage habits.

Table 2. Text Messaging Social Habit Construct Groups

Business Usage (BUS)	
BU1	*I receive ads, coupons, sale information, and weather/traffic alerts through texting.*
BU2	*I text my colleagues to talk about work.*
BU3	*I share ads and business promotional messages through texting.*
BU4	*I received texts as reminders for business, and health appointments.*
Emotional Usage (EMS)	
EM1	*I text others to let them know I care about them.*
EM2	*I text others my appreciation for their help.*
EM3	*I text to show my support when others are having a difficult time.*
Relationship Maintenance Usage (RMS)	
RM1	*I text others about how I am doing.*
RM2	*I send texts of holiday messages whenever there are holidays.*
RM3	*I text others just to say hello.*
RM4	*I text to chat and kill time with others.*
Event Coordination Usage (EVS)	
EV1	*I text others to arrange time for a voice call.*
EV2	*I text to arrange time and place to meet.*
EV3	*I text to clarify things in our last face-to-face conversation.*
Contact Urgency (CUS)	
CU1	*I respond to text messages within 1 minute.*
CU2	*I text others during a public event (concerts, movies, plays, etc.).*
CU3	*I text others during religious sermons or solemn religious events.*

Qualitative Method

A review of the analysis of the quantitative findings was used to assist in directing the qualitative portion of the study. The data gathered from this step helped to further shape the qualitative portion of the study, isolating various themes and patterns that emerged among the generational groups. It has been suggested that elementary interpretive research questions leading to qualitative data collection and analysis strategies should generally be open-ended and exploratory, and exploratory questions are suitable as the base for qualitative inquiry used when existing research is confusing, contradictory, or not moving forward (Barker et al., 2002). Semi-structured interviews were conducted with members of each generational group regarding their current use of mobile text messaging. The interviews were between 10 and 15 minutes, conducted by the researcher using face-to-face interviews, video calls, and traditional phone calls.

Convenience sampling using the researcher's LinkedIn connections was used to select an appropriate number of interviewees. Participants were contacted through email, inviting voluntary participation in an interview. The interview questions were designed to elicit information and opinions about a participant's current use of mobile text messaging, and to assist in addressing some of the findings resulting from the quantitative analysis. Interviews were transcribed by the researcher and compiled with field notes taken during the interviews. The interviewees had a pre-existing relationship with the researcher as either a former coworker, business acquaintance, or former student, but the researcher did not have access to the participant's anonymous quantitative survey data. The transcribed interviews were not returned to participants for feedback. No identifiers

were recorded that could be used to determine the identity of any of the interviewed participants, other than a generational group member identifier.

Qualitative Data Analysis

Transcripts and field notes were analyzed by the researcher to identify emergent ideas and concepts expressed by participants and to ensure sufficient data saturation was achieved, using elementary interpretive methodology (Caelli, Ray & Mill, 2003; Patton, 2005; Merriam, 1998). Basic interpretive methodologies allow researchers to better understand processes and phenomena and to allow the examination and discovery of any themes and patterns which may be present in texting activities. The initial questions asked of all participants are provided in Appendix B. Other questions generated as a result of the quantitative analysis were asked of members of specific generational groups. Interviews were conducted across each generation group until consensus was achieved, or it became apparent the responses were too diverse to establish a consensus.

Presentation of Results

The final stage of the research methodology concerns the reporting of the findings and results. The reporting output section was organized around the research questions, supporting data from the content, modifications resulting from the pilot survey results, various statistical analysis tests, and findings and conclusions from the personal interviews. A discussion regarding the support of the hypothesis was provided, and the mechanics and governance of the final survey and any issues of reliability were addressed in detail. Discussion of each variable from the model was conducted, including comparing and contrasting the findings against extant literature to determine contribution

of the research. This was summarized, and followed by the researcher's conclusions, implications for further research, and recommendations supporting the research questions, as well as commentary on the generalizability of the results, and relevance of the study to the knowledge management body of knowledge.

Resource Requirements

Any research or clinical investigation that involves human subjects conducted by Nova Southeastern University (NSU) students requires the consent and approval of the NSU Institutional Review Board (IRB). This is done to determine and ensure that the welfare and rights of human subjects are adequately protected and informed consent is given, if necessary. It ensures that human subjects are not placed at unreasonable physical, mental, or emotional risk as a result of research, that the necessity and importance of the research outweighs the risks to the subjects, and that the researcher(s) is/are qualified to conduct research involving human subjects.

In compliance with this process, the researcher passed the required coursework concerned with the protection of human subjects to ensure that the rights of human participants are protected. The researcher then completed the necessary and required Institutional Review Board (IRB) forms, and a review was conducted by the faculty committee chair who then forwarded the completed forms to the IRB for review. After several iterations, approval from the IRB for the research to proceed was granted in October of 2017, and is shown in Appendix C. Permission from the Office of Instructional Effectiveness at Hodges University (IE) was obtained in order to collect data directly from students. Survey software was used to develop and deploy the survey

instrument. For the collegiate and LinkedIn audiences, Google Forms® was used, and for the subsequent survey necessary to ensure a viable sample size, the Survey Monkey software and services were used. Both data sets were then downloaded into Excel for data reformatting and initial cleaning and to ensure a consistency in the reported format from both sources. Following data collection, IBM's Statistical Package for the Social Sciences® (SPSS) as well as Microsoft Excel 2016 were used to analyze the data. The participant letters used in the anonymous survey is shown in Appendix D, along with the e-mail invitation for telephone interview and the participation letter for those who agreed to assist in the telephone interview, in Appendices E and F. The data collection process was completed on Jan 31, 2018.

Summary

This chapter addressed the methodology approach for the completed study. A description of the quantitative methodology was described in detail: the method used to create the proposed instruments, the selection of a survey vehicle to gather the raw data, the creation of the hypotheses and theoretical model, and the screening and analysis of the data were discussed, including the various statistical methods used to screen and analyze the surveyed data. This was followed by a discussion of the qualitative section of the study, designed to further isolate the various motivations behind the usage habits that were discovered in the quantitative analysis by employing an elementary interpretive methodology and codification of the results for analysis. Finally, descriptions of the various presentation formats and required resources were listed.

Chapter 4

Results

Overview

This section presents an objective description and analysis of the findings, results, and outcomes of the research. First, a more detailed description of the data collection, data sanitization and legitimization processes are discussed, followed by the analysis of that quantitative data. The results of this analysis are presented and a discussion of the findings in context of the hypotheses is presented along with guidance for further directing subsequent qualitative interviews. The qualitative data from the interviews are discussed next along with a summary of both the quantitative and qualitative analysis. Due to the size of the tables resulting for the statistical tests, the between group comparisons of generational groups (GG) on each of the three usage habits: text messaging usage volume (UV), text messaging partner choices (TMPC), and text messaging social habits (SH), as well as all pairwise comparisons of generational groups on each of the usage habits UV, TMPC, and SH with covariates of gender, employment status, and education level are show in Appendices G thru R respectively.

Quantitative Data Analysis

Invitations to participate in the study along with the consent form were sent directly to 555 of the researcher's 563 LinkedIn network members. Eight members of the

network were excluded as either members of the Dissertation committee or as members of the Delphi committee. This yielded a positive response of 250 LinkedIn participants, either directly or indirectly through snowball sampling. Concurrent to this effort, after eliminating 62 current students of the researcher, 3,538 surveys were mailed directly to students at Hodges University in two separate attempts. This resulted in 111 additional responses, bringing the total responses to 361, somewhat less that the required number. A preliminary scan of the data indicated an insufficiency in the number of responses received for the generational groups Generation Z and the Post-War Silent Generation. This led to the incorporation of the Survey Monkey service in order to provide the needed 250 additional responses to meet the sample size criteria across the generational groups. The final data extract was downloaded on January 31, 2018 into an Excel spreadsheet, at which time the surveys were closed to additional participants. An initial inspection of the data resulted in 27 cases being discarded due to containing invalid data with regard to year of birth being either blank, not a valid year, not meeting the participation requirements, being ineligible due to being under 18, or not being a participant in text messaging from a mobile device.

Response set, or response bias, is the inclination of respondents to agree with questionnaire statements regardless of the item content, which could potentially threaten the validity of the data (Winkler et al., 1982). Vague and confusing wording of survey items can lead to response bias. To address the issue of response set, an inspection of the responses was conducted to discover if any participants had answered all of the answers in the same way. Although there was a possibility that a respondent might have answered honestly, but not in accordance with expectations, an analysis of other data responses

revealed an unexpected pattern with one respondent in particular. This respondent answered most of the questions in the same way, including both positive and negative items, indicating that the respondent may not have been paying attention to the questions, or was not being completely honest. This participant's answers were identified as potentially biased and the case, C-285, was eliminated from the dataset before further analyses were conducted. This dataset was then imported into IBM's Statistical Package for the Social Sciences® (SPSS) for further data analysis.

Using the Duplicate Cases function of SPSS, a frequency analysis was run revealing that two cases, (C-008 and C-016) were identical. Further review of these two cases revealed the responses to every question were identical. This led to case C-016 being removed from the dataset. The elimination of outliers was then addressed. Outliers can result in serious skewing of the results, inflating error rates and substantially distorting parameter and statistic estimates, and therefore must be examined before final analysis of data (Osborne & Overbay, 2004). Mahalanobis Distance was used to determine if such outliers existed and whether or not they should be retained or removed from the final analysis. Using a Chi-square table with a critical value of chi-square at $p < 0.01$., standard statistical tests were done to validate the data and to discard any outliers. Case Numbers C-300, C-339, C-350 and C-095 were removed because of their demonstration as multivariate outliers, as shown in Table 3.

Table 3. Mahalanobis Distance Extreme Values

			Case Number	CaseID	Value
Mahalanobis Distance	Highest	1	1	C-300	28.64126
		2	2	C-339	28.64126
		3	3	C-350	28.64126
		4	4	C-095	28.24032
		5	5	C-437	21.79051
	Lowest	1	574	C-547	.71867
		2	573	C-500	.71867
		3	572	C-492	.71867
		4	571	C-531	.97711
		5	570	C-521	.97711

For the two cases of missing non-demographic data in the usage sub-construct survey questions, cases C-148 and C-155, mean substitution was utilized, as the subscales all contained a greater than 99% data completion (Van Buuren, 2012). This type of instrument has been validated by several researchers: Collins et al. (2003), Khan (2008), and Ehrenberg et al. (2008) utilized participant self-measured self-assessed answers to behavioral questions as measured on a Likert scale.

As a result of the pre-analysis data screening described in the preceding paragraphs, 33 cases in total were removed, and two were modified: 27 responses were removed due to invalid data or ineligibility, one case was removed as being questionable with regard to honesty of response, another was removed due to being identical to another response, and four additional cases were removed as a result of the Mahalanobis Distance test identifying these cases as outliers. This resulted in a dataset containing 570 responses to be considered for further analysis.

Demographic Statistics

To provide useful and accurate answers to the research questions, the sample used needed to be representative of the population (Sekaran, 2013). In order to further determine the representativeness of the sample, demographic data were requested from the survey participants. The population of the United States per the US Census Bureau, which only recorded the binary options of male or female, consisted of approximately 49% male and 51% female (Howden & Meyer, 2011). This compared to this survey samples of 46% male and 52% female, with <1% indicating a gender of other, and <1% opting not to identify. However, as there was no option in the census data to specifically allow for "other" or "prefer not to answer" designations, there was no ability for a direct comparison between the sample data and the general population with regard to non-binary gender identities. In addition, the reported numbers in the sample for "other" and "prefer not to answer" were not sufficient to warrant inclusion in this study, with each only representing 0.35% of the overall sample. As the responses in these two categories combined represent less than 1 percent of the overall sample, cases C-263, C-403, C-432, and C-437 were removed from consideration, as indicated in Table 4, yielding a dataset of 566 cases.

This resulted in a more accurate comparison between the census data and the survey sample. Of the respondents in the final data set selecting only binary choices, representing 566 respondents, approximately 47% selected male and 53% chose female, differing from the US Census by an adjusted 2%. The distribution of the data collected appears to be more representative of the population with regard to gender.

Table 4. Gender Representation

Total Gender representation from Sample

Gender	Frequency	Percent
Male	266	47%
Female	300	53%
Other	2	<1%
Prefer not to Answer	2	<1%

Adjusted Gender representation from Sample

Gender	Frequency	Percent
Male	266	47%
Female	300	53%

The data cleaning and validation process resulted in the removal of 35 cases as indicated in Table 5.

Table 5. Survey Data Collection and Cleaning Summary

Data Sources	Number of Responses
LinkedIn Network	240
Hodges University Students	111
Survey Monkey	250
Total Responses Received	601

Data Response Removal Causes	Number of Responses
Invalid Data	27
Biased Answers	1
Duplicate Cases	1
Outliers (Mahalanobis Distance)	4
Non-Binary Responses	2
Total Responses Removed	35
Total Responses (Cases) to be Considered	566

With regard to the generational groups, specific minimum numbers of participants for each generational group were previously determined to ensure the sample size was accurately characteristic of the population. All but the Generation Z group had more than the minimum number of required responses to be representative of the population as a whole. To eliminate over-representation of those generational groups who had greater than the minimum number of survey responses, stratified random sampling was applied (Onwuegbuzie, 2007) to the dataset to adjust the final sampling frame for each generational group to be proportionally representative of the generational groups on a pro-rata basis with the actual population. This reduced the final dataset to be considered for analysis to 386 cases, as indicated in Table 6. The results of all subsequent tests shown in the body of the text, and in Appendices G-R utilize a value for n=386.

Table 6. Minimum Sample Value Responses

Generational Group	Minimum Required	Actual Responses	Stratified Responses
Post-War Silent Generation	30	75	30
Baby Boomers	92	127	92
Generation X	64	93	64
Millennials	96	167	96
Generation Z	104	104	104
Total:	***386***	***566***	***386***

In considering the education level of the participant's status of the participants as compared to the US population (United States Census, 2017), the data from the survey is not indicative of the demographics of the US, as a significant portion of the survey data was collected from college students and professionals from the researcher's LinkedIn connections, and - the education levels were higher in the sample data that would be found in the general population, as indicated in Table 7.

Table 7. Education level

	Survey Data	US Census Data
Less than High School	2.8%	11.0%
High school graduate or GED	17.1%	28.9%
Some college / 2-year degree	31.9%	28.7%
4-year college graduate	30.1%	20.0%
Master's degree	11.9%	8.4%
Terminal Degree (PhD, EdD, DMin, JSD, etc.)	4.4%	3.0%
Prefer not to answer	1.8%	n/a

Looking at this across the generational groups, it appears there may be a relationship between education level and generational group, as indicated in Figure 2. This may simply be a function of the participants' chronological ages, in that the achievement of particular education levels do have a certain temporal requirement. Even so, it does indicate Baby Boomers do not top the marks for any education level.

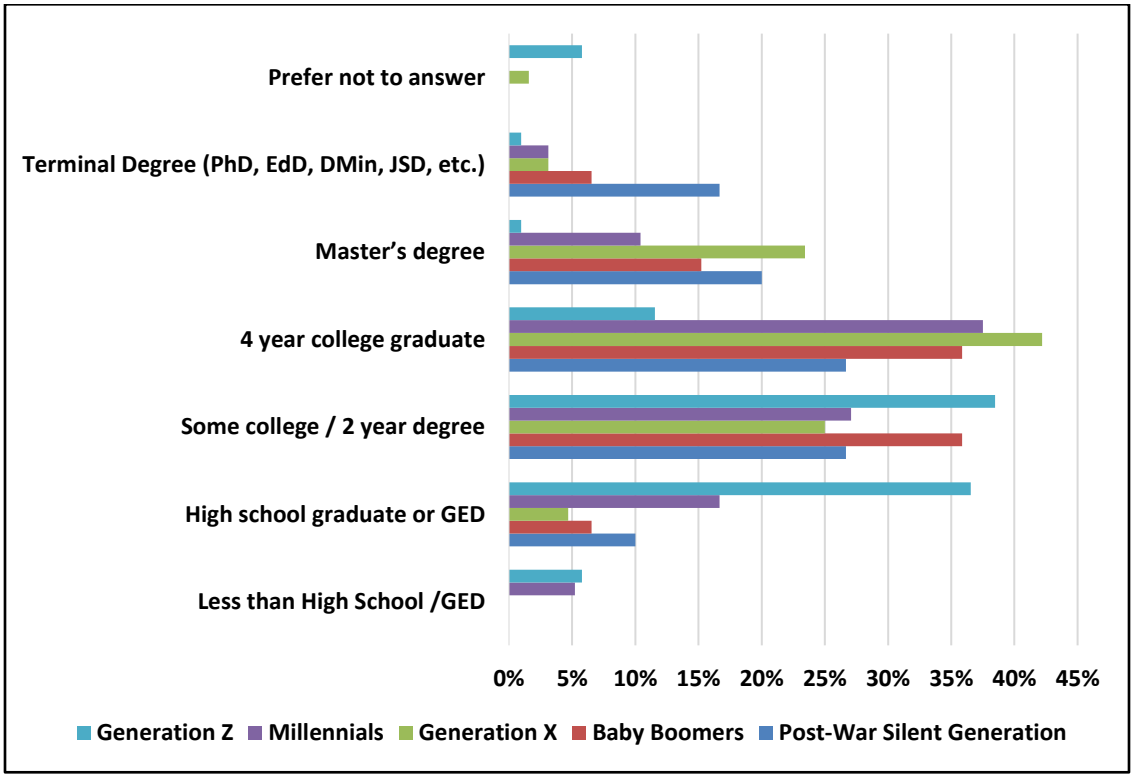

Figure 2. Education level by Generational Group

Although there is existing US census data reporting employment status with regard to full employment, partial employment, and unemployment, there is little direct category-to-category comparative research breaking down the US population into the employment status categories used by this research. Table 8 summarizes the employments statuses and frequencies found in the survey sample data.

Table 8. Employment Status by Generational Group

Employment Status	Post-War Silent Generation	Baby Boomers	Generation X	Millennials	Generation Z
Currently seeking employment	0.0%	3.3%	6.3%	4.2%	12.5%
Home or resident primary caregiver	0.0%	0.0%	0.0%	0.0%	1.0%
Homemaker	0.0%	1.1%	6.3%	6.3%	1.9%
Prefer not to answer	0.0%	1.1%	1.6%	1.0%	12.5%
Retired	73.3%	25.0%	3.1%	1.0%	1.0%
Unemployed, not seeking employment	0.0%	1.1%	3.1%	5.2%	14.4%
Volunteer	10.0%	2.2%	0.0%	2.1%	2.9%
Work at least 40 hours/week, >1 job	0.0%	1.1%	1.6%	2.1%	1.0%
Work full-time (40+ hours/week)	6.7%	56.5%	71.9%	60.4%	26.0%
Work part-time	10.0%	8.7%	6.3%	17.7%	26.9%

Reliability Analysis

Cronbach's alpha reliability tests were conducted for the business usage, (BUS) emotional usage (EMS), relationship maintenance (RMS), event coordination (EVS), and contact urgency (CUS) constructs to determine consistency across items for each scale. The resulting coefficient of reliability ranges from 0 to 1 in providing an overall assessment of a measure's reliability. If all of the scale items are fully independent from one another, showing no correlation or covariance, then the coefficient of reliability

ranges will approach 0. If all of the items have high covariance, then the coefficient of reliability will approach 1 (Cronbach, 1951). The higher the coefficient, the more the items have shared covariance and likely measure the same underlying concept (Henson, 2001). Many methodologists recommend a minimum coefficient between 0.65 and 0.80, and coefficients that are less than 0.5 are usually unacceptable. The results, presented in Table 9, demonstrated medium to high reliability across all constructs with the exception of CUS (Contact Urgency), which showed only a moderate reliability.

Table 9. Reliability Summary

Variable	Cronbach's alpha
BUS - Business Usage	0.601
CUS - Contact Urgency	0.514
EMS - Emotional Usage	0.819
EVS - Event Coordination	0.652
RMS - Relationship Maintenance	0.717

Research Question Analysis and Results

In order to address the first research question, *how does a person's generational group affect their text messaging usage habits*, what constituted text messaging usage habits used by the various generational groups had to first be ascertained. The three components that constitute text messaging usage habits; social habits (SH), usage volume (UV), and text messaging partner choices (TMPC) were investigated. As recommendations suggest that descriptive statistics should be presented using graphical displays (Valentine et al, 2015), various charts and graphs have been used to supplement the statistical tests to provide a better understanding of the overall data and the analysis

outcomes. Table 10 indicates the message volume percentage sent and received by each generation group.

Table 10. Volume of messages sent/received by Generation Group

		Messages Sent % of Generational Group					
	Members	1-10	11-25	26-100	101-250	> 250	
Post-War Silent Generation	30	96.7%	0.0%	3.3%	0.0%	0.0%	
Baby Boomers	92	73.9%	20.7%	3.3%	2.2%	0.0%	
Generation X	64	57.8%	25.0%	15.6%	0.0%	1.6%	
Millennials	96	32.3%	30.2%	32.3%	2.1%	3.1%	
Generation Z	104	29.8%	21.2%	27.9%	13.5%	7.7%	
Total	386	50.8%	22.3%	19.2%	4.7%	3.1%	100%

		Messages Received % of Generational Group					
	Members	1-10	11-25	26-100	101-250	> 250	
Post-War Silent Generation	30	90.0%	6.7%	3.3%	0.0%	0.0%	
Baby Boomers	92	67.4%	27.2%	5.4%	0.0%	0.0%	
Generation X	64	59.4%	23.4%	15.6%	0.0%	1.6%	
Millennials	96	36.5%	25.0%	29.2%	6.3%	3.1%	
Generation Z	104	30.8%	22.1%	22.1%	16.3%	8.7%	
Total	386	50.3%	23.1%	17.4%	6.0%	3.4%	100%

The sent and received messaging volumes percentages for each group were not greatly dissimilar, with only two generational group differing in their sending and receiving lowest volumes by more than 6.7%. All other send and receive volumes were under a 6% difference. The messages sent volumes and the messages received volumes were then aggregated into a single variable (UV) for all subsequent tests, and the data was then examined using a univariate linear analysis to test the effect of generational group membership on the participant's overall messaging volume. A test of between-subjects

effects indicated statistically significant differences between groups: (F (4,381) = 25.697, p = .000), as shown in Table 11.

Table 11. Tests of Effects between GG and UV

Tests of Between-Subjects Effects					
Dependent Variable: UV					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	372.250[a]	4	93.062	25.697	.000
Intercept	3843.776	1	3843.776	1061.353	.000
GG	372.250	4	93.062	25.697	.000
Error	1379.823	381	3.622		
Total	7214.000	386			
Corrected Total	1752.073	385			

As there were statistically significant differences between the groups as a whole, the multiple comparisons test was run to determine which specific groups were different from each other. The results of the multiple comparisons test, shown in Appendix G, indicated the Post-War Silent Generation Baby Boomers were very similar in their messaging volumes with a significance value of p=.771, and Baby Boomers and Generation X were also similar, although somewhat less, with a significance value of p=.612, but that none of the other groups were as similar.

The second component of the text messaging usage habits analyzed were the text messaging partner choices (TMPC) across the generational groups. The send and receive partner choices were examined using a multivariate analysis to determine if there were any significant differences in the choice of text messaging partners as related to the participants' generational group membership. The significant portion of between-subjects' effects of the Generation group (GG) on the TMPC variables shown in Table 12 indicated statistically significant differences between generational groups for nearly

every send and receive category. The exceptions to this were the texts exchanged with non-immediate family members, with a significance values of p=.248 and p=.597 respectively for sending and receiving, for receiving weather and emergency alerts, at significance values of p=.426, and a very slight similarity for receiving event reminders, sales alerts or coupons, and banking messages, at p=.061

Table 12. Tests of Effects between GG and TMPC

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of	df	Mean Square	F	Sig.
GG	SCOB	2.275	4	.569	3.102	.016
	SD	15.377	4	3.844	26.041	.000
	SFA	4.519	4	1.130	10.267	.000
	SFR	5.938	4	1.485	7.075	.000
	SM	18.831	4	4.708	28.086	.000
	SSOS	9.102	4	2.275	10.123	.000
	SS	7.570	4	1.892	13.189	.000
	SOFM	1.347	4	.337	1.359	.248
	SO	1.691	4	.423	3.542	.007
	RCOB	2.126	4	.531	3.184	.014
	RD	14.839	4	3.710	25.836	.000
	RFA	4.180	4	1.045	9.755	.000
	RFR	4.628	4	1.157	5.050	.001
	RM	20.103	4	5.026	30.780	.000
	RSOS	8.250	4	2.062	8.925	.000
	RS	6.378	4	1.595	12.742	.000
	ROFM	.650	4	.163	.693	.597
	RO	2.280	4	.570	5.795	.000
	RDDOH	1.745	4	.436	3.548	.007
	REMSA	1.423	4	.356	2.274	.061
	RCVW	.459	4	.115	.966	.426

The results of the multivariate pairwise comparisons with Scheffé shown in Appendix H indicated a number of both similarities and differences in the selection of

partner choices within the generational groups. Every generation uses the medium primarily to send messages to a family member, and secondarily to send to friends. All generational groups are nearly identical in their selection of other family members for sending and receiving messages, and in the receiving of event notifications and weather alerts. It is worth noting that Generation X sends and receives messages to their spouse or significant other much more than the other generational groups, by over 14% and 11% respectively. Usage percentages for text messaging partner choices for sending and receiving messages are shown in Figures 3 and 4.

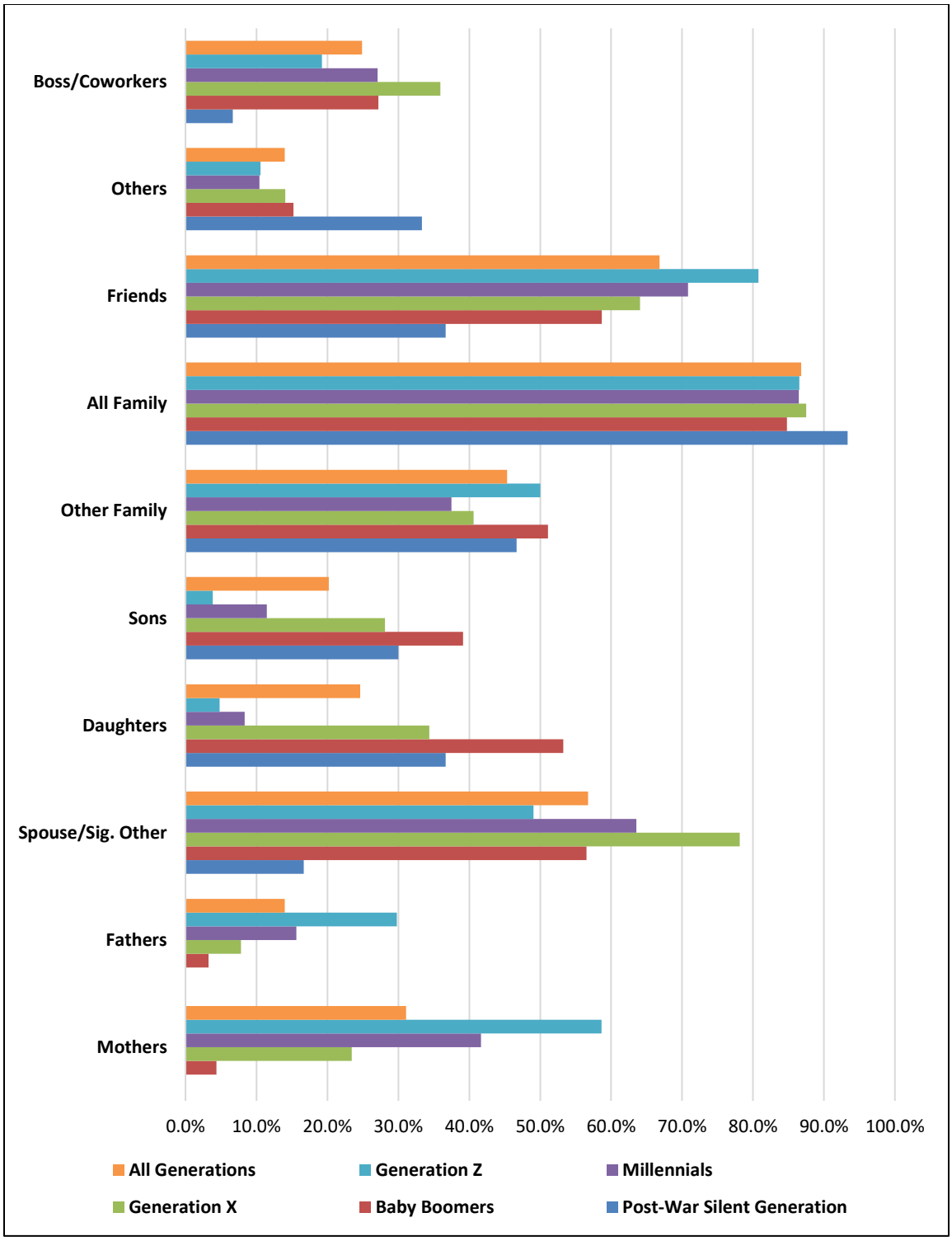

Figure 3. Text Messaging Conversation Send Partners

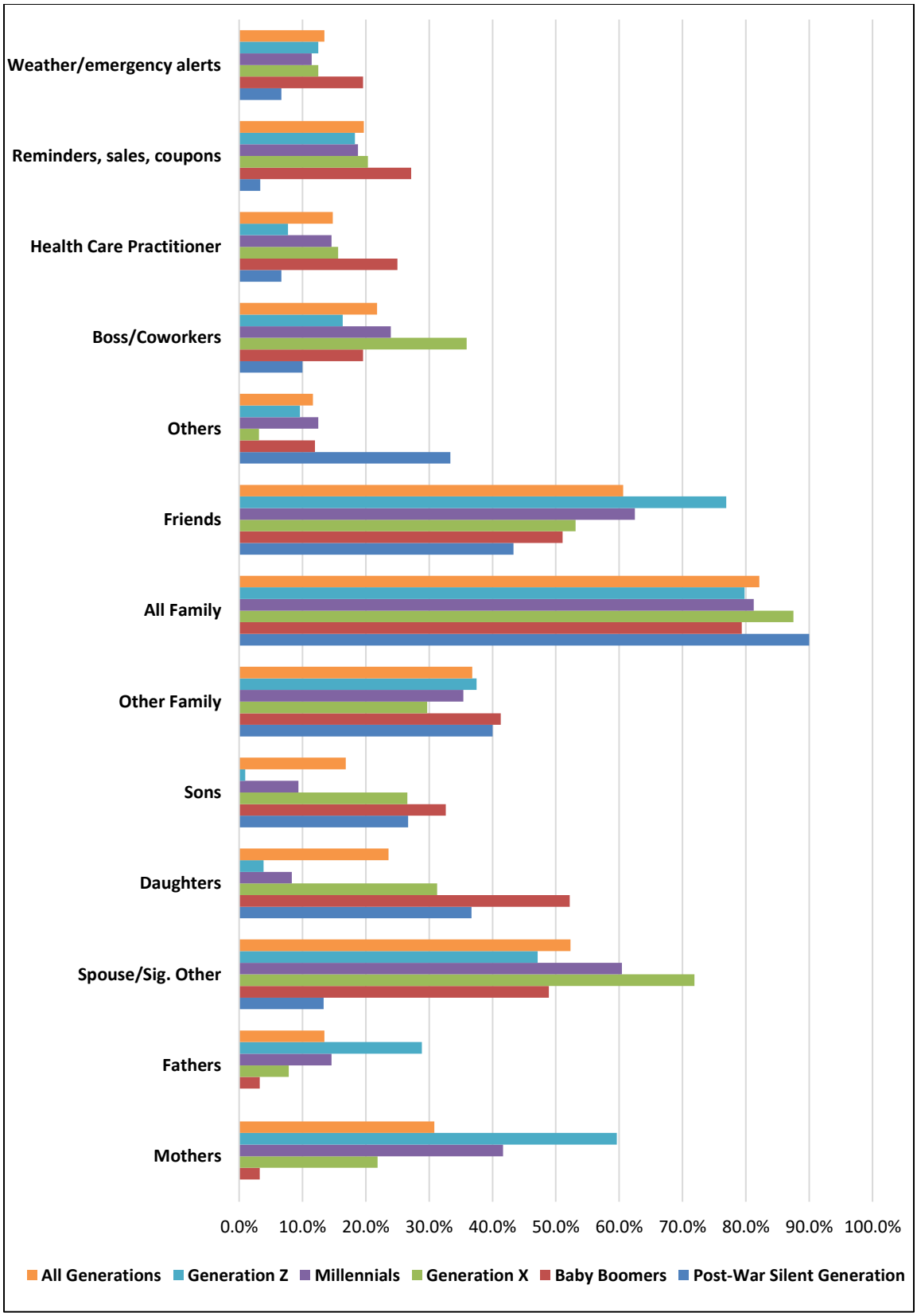

Figure 4. Text Messaging Conversation Receive Partners

The third and final component of the text messaging usage habits are the social usage habits (SH) gathered via the BUS, EMS, RMS, EVS, and CUS constructs representing Business Usage, Emotional Usage, Relationship Maintenance, Event Coordination, and Contact Urgency. Multivariate analysis was selected to determine whether the generational group membership had influence over the social usage habits, which as shown in Table 13 indicated a strong determination with all significance values at or below p=.001, with the exception of use of texting for business purposes, which showed weak similarities at p=.104.

Table 13. Tests of Effects between GG and SH

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
GG	BUS	72.754	4	18.188	1.933	.104
	EMS	228.764	4	57.191	7.316	.000
	RMS	743.056	4	185.764	18.450	.000
	EVS	203.778	4	50.944	8.890	.000
	CUS	108.221	4	27.055	7.905	.000

The multivariate comparisons shown in Appendix I indicated in terms of business use, all generational groups have some similarities in their usage, further validating that business usage is not significantly influenced by generational group membership. Usage for emotional support was found to be nearly identical for Generation X, Millennials, and Generation Z with significance numbers from p=.784 to p=970. Relationship maintenance numbers parallel those for emotional support; usage was found to be again nearly identical for Generation X, Millennials, and Generation Z with significance values from p=.868 to p=.999. In looking at event coordination, the Post-War Silent

Generations is unlike any other group, with a highest significance value p=.005. Generation X, Millennials and Generation Z are again very similar in this area, with significance values of p=.289, p=.939, and p=.692, with the habits of Baby Boomers and Generation X very similar at p=1.000. Lastly, a generational group's sense of urgency in exchanging text messages is also inconsistent; the Post-War Silent generation is somewhat similar to Baby Boomers, with p=.250, but unlike any other generational group, with between group significance values ranging from p=.000 to p=.006. And as in the case of relationship maintenance and emotional support, the youngest three generational groups again are very similar in their habits, with significance values of p=.562, p=.872, and p=.996.

Testing Gender as a Covariate to Generational Group

Addressing the second research question, *how does a person's generational group affect their text messaging usage habits when controlling for gender*, a univariate analysis with UV as the dependent variable, the generational group as the independent variable, and gender as the covariate was done. The results, shown in Table 14, indicated a significant difference (F (4, 380) =25.698, p=.000) in usage volume between the generational groups after controlling for gender, but does not difference significantly from (F (4, 381) =25.697, p=.000) results from the original analysis without controlling for gender.

Table 14. Test of Gender Effect as Modifier to GG on UV

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	373.329[a]	5	74.666	20.579	.000
Intercept	409.185	1	409.185	112.777	.000
GENDER	1.079	1	1.079	.297	.586
GG	372.962	4	93.240	25.698	.000
Error	1378.743	380	3.628		
Total	7214.000	386			
Corrected Total	1752.073	385			

Examination of the pairwise comparisons shown in Appendix J show the existence of strong similarities between many groups, but not for others. The nearly identical generational groups with regard to usage volume when controlling for gender are the Post-War Silent Generation and Baby Boomers, at a significance value of p=1.000 and Baby Boomers and Generation X, at a significance value of p=.1.000. A slighter similarity exists between the Post-War Silent Generation and Generation X, at p=.125, and between Millennials and Generation Z, at p=.101. Generation X, Millennial's and Generation Z have little similarities, with values ranging from p=.000 to p=.007.

To evaluate the second variable addressing the third research question, a multivariate analysis was run with all TMPC constructs as the dependent variables, the generational group as the independent variable, and gender as the covariate, with the results shown in Table 15.

Table 15. Test of Gender Effect as Modifier to GG on TMPC

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
GG	SCOB	2.252	4	.563	3.069	.017
	SD	15.357	4	3.839	25.942	.000
	SFA	4.496	4	1.124	10.213	.000
	SFR	6.097	4	1.524	7.418	.000
	SM	18.977	4	4.744	28.505	.000
	SSOS	9.189	4	2.297	10.237	.000
	SS	7.504	4	1.876	13.119	.000
	SOFM	1.275	4	.319	1.300	.269
	SO	1.729	4	.432	3.637	.006
	RCOB	2.115	4	.529	3.161	.014
	RD	14.819	4	3.705	25.735	.000
	RFA	4.145	4	1.036	9.716	.000
	RFR	4.726	4	1.182	5.273	.000
	RM	20.219	4	5.055	31.078	.000
	RSOS	8.338	4	2.084	9.031	.000
	RS	6.316	4	1.579	12.699	.000
	ROFM	.638	4	.159	.678	.607
	RO	2.300	4	.575	5.849	.000
	RDDOH	1.731	4	.433	3.604	.007
	REMSA	1.426	4	.357	2.275	.061
	RCVW	.451	4	.113	.950	.435

The results indicate significant differences in all partner choices except sending to and receiving from other family members, at significance values of p=.269 and p=.607 respectively and the receiving of weather and other emergency alerts, with a significance value of p=.435. A very slight similarity at p=.061 was indicated for receiving event reminders, sales alerts or coupons, and banking messages. All other TMPC constructs were found to be significantly influenced with p values of .000 thru .017. The pairwise comparisons in Appendix K show a significance value for p greater than .05 in 64% of

the pairwise combinations. This points towards many generational groups being more different than similar in their choices of text messaging partners.

For the third covariate test of gender, a multivariate analysis with all SH constructs as the dependent variables, the generational group as the independent variable, and gender as the covariate was completed. The results shown in Table 16 indicate statistically significant differences between the groups while adjusting for gender in all social usage categories with the exception of business, which was reduced from p=.104 without the influence of gender to p=.083 when gender is a covariate., indicating that gender has a slight but negligible effect on texting in support of business usage.

Table 16. Test of Gender Effect as Modifier to GG on SH

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
GG	BUS	76.136	4	19.034	2.080	.083
	EMS	237.961	4	59.490	7.895	.000
	RMS	763.432	4	190.858	19.674	.000
	EVS	205.515	4	51.379	8.979	.000
	CUS	107.115	4	26.779	7.826	.000

The pairwise comparisons shown in Appendix L show that after adjusting for the effect of gender, usage for business is very similar for all generations except the Post-War Silent Generation. For the other four social habits, Generations X, Millennials, and Generation Z are very similar, with p=.262 to p=1.000 for all between group comparisons.

Testing Employment Status as a Covariate to Generational Group

To analyze the data for the third research question, *how does a person's generational group affect their text messaging usage habits when controlling for employment status*, the three constructs of UV, TMPC, and SH were again tested. A univariate analysis with UV as the dependent variable, the generational group as the independent variable, and employment status as the covariate was run. The results indicated a significant difference (F (4, 380) =25.669, p=.000) in usage volume between the groups whilst adjusting for employment status, as shown in Table 17. This compares to (F (4, 381) =25.697, p=.000) when not controlling for employment status.

Table 17. Test of Employment Status Effect as Modifier to GG on UV

Tests of Between-Subjects Effects					
Dependent Variable: UV					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	373.132[a]	5	74.626	20.565	.000
Intercept	533.470	1	533.470	147.010	.000
EMPSTAT	.882	1	.882	.243	.622
GG	372.591	4	93.148	25.669	.000
Error	1378.941	380	3.629		
Total	7214.000	386			
Corrected Total	1752.073	385			

Reviewing the pairwise numbers, shown in Appendix M, the employment status of the Post-War Silent Generation and Baby Boomers seems to affect their text-messaging usage volume in a very similar fashion, with significance values of p=1.000, and a similarity indicated in usage volumes between Baby Boomers and Generation X at significance values of p=.995. Millennials and Generation Z have some similarity as well, though not as strong, with p=.139.

Next, a multivariate analysis with the individual TMPC constructs as the dependent variables, the generational group as the independent variable, and employment status as the covariate was done. Results indicated only exchanging messages with a boss or coworkers, other family members, the receiving of weather and other emergency alerts, and the receiving of event reminders, sales alerts or coupons, and banking messages had *p* values above .05, indicating low significance. All other partner choices seem to be related to the generational group when adjusting for employment status. The employment effect is further illustrated in Table 18.

Table 18. Test of Employment Status as Modifier to GG on TMPC

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
GG	SCOB	1.186	4	.296	1.703	.149
	SD	15.367	4	3.842	25.959	.000
	SFA	4.551	4	1.138	10.324	.000
	SFR	5.836	4	1.459	6.943	.000
	SM	18.842	4	4.711	28.084	.000
	SSOS	7.319	4	1.830	8.240	.000
	SS	7.569	4	1.892	13.153	.000
	SOFM	1.037	4	.259	1.053	.380
	SO	1.464	4	.366	3.076	.016
	RCOB	1.411	4	.353	2.189	.070
	RD	14.834	4	3.708	25.760	.000
	RFA	4.304	4	1.076	10.113	.000
	RFR	4.650	4	1.162	5.062	.001
	RM	20.140	4	5.035	30.863	.000
	RSOS	6.689	4	1.672	7.309	.000
	RS	6.397	4	1.599	12.752	.000
	ROFM	.563	4	.141	.600	.663
	RO	2.043	4	.511	5.207	.000
	RDDOH	1.645	4	.411	3.339	.011
	REMSA	1.233	4	.308	1.972	.098
	RCVW	.461	4	.115	.967	.425

In looking at these partner choices in there is some limited but not complete support for the supposition that the generational group affects the TMPC choices after adjusting for the effect of employment status, specifically in the selection of bosses and coworkers as texting partners. Pairwise comparisons, in Appendix N show that while there is some indication the generational group does affect the selection of TMPC for some partners after adjusting for the effect of employment status, far more pairwise partners showed significance values of *p* above .05, in nearly 68% of the pairwise combinations. This indicates generational groups are similar in their choice of text messaging partners when adjusting for employment status.

The third employment status covariate was examined using a multivariate analysis with all SH constructs as the dependent variables, the generational group as the independent variable, and employment status as the covariate. The results, delineated in Table 19, indicated significant differences between the groups while adjusting for employment status in all social usage categories with the exception of business usage (BUS) at *p* values at .000. Employment status does not seem to be significant, with the *p* value changing from .104 only to to.100 when considering the effect of employment status on business usage; all other social habits were unchanged at *p*=.000

Table 19. Test of Employment Status Effect as Modifier to GG on SH

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
GG	BUS	74.032	4	18.508	1.963	.100
	EMS	223.206	4	55.802	7.122	.000
	RMS	707.961	4	176.990	17.680	.000
	EVS	198.794	4	49.698	8.656	.000
	CUS	111.711	4	27.928	8.180	.000

The pairwise comparisons in Appendix O show all the generational groups are strongly similar in usage habits for business, while Baby Boomers, Generation X, Millennials, and Generation Z have strong commonality with regard to emotional support, and Generation X, Millennials, and Generation Z are similar in their habits for relationship maintenance, event reminders and notifications, and sense of urgency.

Testing Education level as a Covariate to Generational Group

The fourth research question, *how does a person's generational group affect their text messaging usage habits when controlling for education level*, was addressed first by running a univariate analysis with UV as the dependent variable, the generational group as the independent variable, and education level as the covariate. Table 20 shows the results, indicating a significant difference (F (4, 380) =22.911, p=.000) in usage volume between the groups whilst adjusting for education level, compared to the original results without covariate of (F (4,381) = 25.697, p = .000), indicating no significant changes in the outcomes on UV with regards to education level.

Table 20. Test of Education Level Effect as Modifier to GG on UV

Tests of Between-Subjects Effects					
Dependent Variable: UV					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	372.254[a]	5	74.451	20.504	.000
Intercept	408.261	1	408.261	112.434	.000
EDUC	.005	1	.005	.001	.971
GG	332.770	4	83.193	22.911	.000
Error	1379.818	380	3.631		
Total	7214.000	386			
Corrected Total	1752.073	385			

Reviewing the pairwise numbers, shown in Appendix P, the generational group's usage volumes, when adjusted for education level are very similar for the Post-War Silent Generation and Baby Boomers, and to a much lesser degree, Baby Boomers have similar usage volumes to Generation X, as do Millennials and Generation Z. All other between group pairwise combinations have significance values of p=.008 or less, indicating the usage habits with regard to volumes are not similar to one another.

A multivariate analysis with the individual TMPC constructs as the dependent variables, the generational group as the independent variable, and education level as the covariate was then conducted. The results indicated only three factors were not related to the generational group when adjusting for education levels status: the send and receive partner choice of other family members at significance values of p=.258 and p=.599 respectively, receiving weather alerts and emergency alerts, with significance values of p=.419, and to a very small extent at p=.061 the receiving event reminders, sales alerts or coupons, and banking messages. All other TMPC factors were shown to have strong significance values of p=.000 to p=.022. As shown in Table 21, there is a strong but not complete support for the generational group affecting the TMPC choices after adjusting for the effect of education level.

Table 21. Test of Education Level Effect as Modifier to GG on TMPC

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
GG	SCOB	2.118	4	.530	2.889	.022
	SD	14.031	4	3.508	23.701	.000
	SFA	3.956	4	.989	8.964	.000
	SFR	6.132	4	1.533	7.310	.000
	SM	17.608	4	4.402	26.221	.000
	SSOS	8.966	4	2.241	9.966	.000
	SS	7.557	4	1.889	13.176	.000
	SOFM	1.321	4	.330	1.331	.258
	SO	1.617	4	.404	3.379	.010
	RCOB	1.966	4	.491	2.942	.020
	RD	14.225	4	3.556	24.736	.000
	RFA	3.794	4	.949	8.832	.000
	RFR	3.954	4	.989	4.304	.002
	RM	18.367	4	4.592	28.054	.000
	RSOS	8.235	4	2.059	8.900	.000
	RS	6.579	4	1.645	13.190	.000
	ROFM	.649	4	.162	.690	.599
	RO	2.268	4	.567	5.749	.000
	RDDOH	1.651	4	.413	3.350	.010
	REMSA	1.422	4	.356	2.269	.061
	RCVW	.466	4	.117	.979	.419

As with the case of gender and employment status, when looking at the choice of exchanging messages with other family members, all between group pairwise comparisons after adjusting for the effect of education level show a significance value at p=.462 to p=1.000. Looking into the pairwise comparisons shown in Appendix Q, although there is some indication that the generational group has some effect on the selection of TMPC for some partners after adjusting for the effect of education level, far more pairwise partners (65%) show p values at above .05.

The third education level covariate test was a multivariate analysis with all SH constructs as the dependent variables, the generational group as the independent variable, and education level as the covariate. The results, shown in Table 22, indicate significant differences between the groups while adjusting for education level in all social usage categories with all *p* values at .001 or less, with the exception of business usage, with p=.106, compared to a value of .104 when not taking education level into consideration.

Table 22. Test of Education Level Effect as Modifier to GG on SH

Tests of Between-Subjects Effects						
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
GG	BUS	72.579	4	18.145	1.924	.106
	EMS	216.130	4	54.033	6.894	.000
	RMS	626.418	4	156.605	15.691	.000
	EVS	208.026	4	52.007	9.078	.000
	CUS	95.518	4	23.880	6.967	.000

Looking at the pairwise comparisons, found in Appendix R, business use is very similar for Baby Boomers, Generation X, Millennials and Generation Z when adjusting for education level, all at significance values of p=.653 or higher. Generation X, Millennials and Generation Z have commonality with regard to relationship maintenance and to a lesser extent, emotional support, and there is a less significant commonality between the Post-War Silent Generation and Baby Boomers in this same category. For event reminders and notifications, as well as messaging urgency, all generational groups with the exception of the Post-War Silent Generation are similar in their usage. Regarding contact urgency, Generation X, Millennials and Generation Z have commonality after adjusting for education levels.

Quantitative Findings

Effect of Generational Group on Usage Volume

The volume of messages sent and received was found to be directly related to the generational group membership; the younger the generational group membership, the greater the volume of messages sent and received on a daily basis. There appears to be no significant differences in the percentage of messages sent and the percentage of messages received within each of the generational groups, but the overall volumes do vary among the generational groups. There exists enough evidence to conclude there is a directly correlated difference in the median message volume usage among the five generational groups. An individual's text messaging usage habits as measured by text messaging usage volume (UV) are influenced by their generational group (GG) membership - the older the generational group, the lower is their volume of messages sent and received as compared to the other generational groups.

Effect of Generational Group on Text Messaging Partner Choices

In reviewing the text messaging partner choice for receiving data, it should be noted that there are three texting partners that are one-way non-individual partners: doctors, dentists, and other health practitioners (RDDOH); event reminders, sales alerts, and coupons (REMSA); and weather or other emergency alerts (RCVW). Messages are only received from these entities but do require the participant to agree to receive the messages. Significant differences were found in the generational group member's conversation partners, but much of the data gathered could not be directly compared with other generational groups. Due to the chronological nature of the various generational group members, no members of the Post-War Silent Generation indicated they were

sending messages to and receiving messages from either of their parents, who would have been born before 1928, and represent less than less than 1% of the living population of the United States (United States Census, 2017). Similarly, members of Generation Z did not report significant participation in text messaging conversations with their children. Most would not likely have children yet, as the average age for giving birth in the US has continued to rise - the average age of women having their first child was a record high of 26 years old in 2013, as per the Centers for Disease Control and Prevention's National Vital Statistics Report (Martin et al., 2015). Of those members of this generational group who do have children, it is not likely that most of those children would be old enough to participate in text messaging. The Post-War Silent generation also reported the lowest number of texting interactions with their spouses or significant others. This may be the dual influence of the non-mobile nature of many senior's lifestyles due to physical limits or health-related issues combined with the fact that most in this generation group live as a couple with either a married spouse or a common-law partner during their senior years (Stepler, 2016). It may simply not be necessary to use a technology medium for communication with someone who is generally always in close proximity. All groups reported sending and receiving mostly to friends and family, but with varying percentages. Of note is the substantially higher percentage of conversations with their spouse or significant other, averaging over 13% higher than any other group, reported by members of Generation X, and their high percentages for conversations with their immediate family. This would seem to support research indicating their strong dedication to their marriage or life-partner and to be always available for their children (Howe & Strauss, 2007). Another interesting finding is that the Post-War Silent

Generation spend more time sending and receiving with non-family members than any other generational group; approximately one third reporting sending/receiving to non-family non-work partners. Of all the generational groups, Generation X members engage in conversations with co-workers more than any other groups, followed by Millennials and Baby Boomers. This may be related to these groups' members being in the prime of their working careers. Reviewing a participant's text messaging partner choices within their generation group, it was determined that partner choice appears to be unrelated to the generational groups for messages sent/received to/from non-immediate family members, for receiving weather alerts, for receiving weather and emergency alerts, and to a very minor extent, for receiving event reminders, sales alerts or coupons, and banking messages. As far as partner selection is concerned an individual's choice of text messaging conversation partners does seem to be influenced by their generational group membership, with the noted exceptions.

Effect of Generational Group on Social Habits

Of the social habits analyzed, it was found the generational group did not seem to be related to the use of texting for business support. Usage for emotional support was found to be nearly identical for Generation X, Millennials, and Generation Z with significance values from p=.784 to p=.980; all three groups rely on texting for emotional support to nearly the same extent. The Post-War Silent Generation and the Baby Boomers have low between group significance numbers; if the youngest three generational groups were to be considered as a combined group, then the conclusion could be drawn that the generational group membership does influence the emotional support usage. Relationship maintenance numbers parallel those for emotional support;

usage was found to be again nearly identical for Generation X, Millennials, and Generation Z; all three groups rely on texting much the same for relationship maintenance as they do for emotional support. The Post-War Silent Generation and the Baby Boomers have some similarity in their usage, but again both groups are completely different from the youngest three generation groups. Event notification numbers are very disjointed: The Post-War Silent Generation is unlike any other group, and the significance between The Baby Boomers, Generation X, Millennials and Generation Z are very low. Lastly, a generational group's sense of urgency in sending and receiving text messages is also very inconsistent; the Post-War Silent Generation is similar to the Baby Boomers, but have no similarities with any other generational groups. And as similarly seen in the case of relationship maintenance and emotional support, the youngest three generational groups again are very similar in their habits.

As the three factors that constitute overall usage habits (UV, TMPC, and SH) were all found to be significantly or at least somewhat influenced by a member's generational group, **H1,** *an individual's text messaging usage habits and their generational group membership are significantly related is supported.* An individual's text messaging usage habits as measured by the usage habit constituent constructs are influenced by their generational group membership

Moderating Effects of Gender

It was previously shown that generational group membership has a significant effect on usage volume. When examining the effect of generational group membership on usage volume while controlling for gender, the effect of gender is negligible; controlling for gender has no significant influence over usage volume. The effect of

generational group membership on text messaging partner choices usage volume while controlling for gender also has no significant impact on the selection of text messaging partners. All partner choices with the exception of other family members, the receiving of weather and other emergency alerts, and to a minor extent, for receiving event reminders, sales alerts or coupons, and banking messages were shown to be significantly influenced by generational group regardless of gender. In turning to SH, gender as a covariate to the generational group had some small but not significant effect over the outcome with regard to business support only, changing from an initial value of p=.104 to an adjusted value of p=.083. As the three factors indicated by the generational groups were not found to be significantly moderated by the influence of a participant's gender, **H2** *an individual's text messaging usage habits and their generational group membership are significantly related when controlling for gender is not supported*. Irrespective of gender, the generational group appears to have a significant influence over social habits, but gender does not change the outcome.

Moderating Effects of Employment Status

Employment status as a covariate to the generational group had no significant effect with regard to usage volume; UV remained significantly influenced by the generational group despite the effect of employment status, with p=.000 in both cases. Similarly, no significant effect on SH was indicated by employment status as a covariate, with p=.104 without the effect of employment status, and p=.100 when considering employment status. When reviewing the effect of employment status on TMPC, however, there were two partner choices affected. The choice to exchange messages with coworkers or bosses became insignificant when the effect of employment status was

taken into consideration. This may be due to the fact that several of the employment statuses, such as retired or unemployed, do not normally have a coworker or boss element associated with them, and are essentially "non-employment" statuses. As these were the only two of the 21 text messaging partner choices found to be affected by employment status, **H3**, *an individual's text messaging usage habits and their generational group membership are significantly related when controlling for employment status is not supported.* Employment status as a covariate to the generational group had no significant effect.

Moderating Effects of Education Level

Generally speaking, the higher the education level, the more likely one was to send fewer messages per day. UV and SH remain significantly influenced regardless of the education level of the participant, and exchanging messages with other family members, receiving messages for events and emergencies, and choosing to receive event reminders, sales alerts or coupons, and banking messages remain as the only partner choices not influenced by generation group, with or with the moderating influence of education level. **H4**, *an individual's text messaging usage habits and their generational group membership are significantly related when controlling for education level is not supported.* Education level as a covariate had no significant effect of the outcome when modifying generational group.

Qualitative Data Analysis

In the previous section, quantitative analysis was done to determine what the usage habits of various generations were with regard to text messaging, and provided

responses to the first four research questions. In addition to helping to support and explain the quantitative findings, the fifth research question, w*hat are the behaviors and characteristics of the various generational groups with regard to text messaging usage habits*, is addressed.

From the quantitative analysis, several questions were indicated which required interactive interviews in order to augment and clarify some of the findings, and to provide an overall sense of the generational contexts from which the answers were derived. In pursuing this, selected and available members of the researcher's LinkedIn contacts were interviewed in a semi-structured forum. Four members of Generation Z and the Post War Silent Generation were interviewed, as well as five Baby Boomers, and six members of both Generation X and the Millennials in order to obtain consensus on each of the questions. Seven common questions were asked of all participants:

1. Do you text more than you talk on your mobile phone?
2. Has your texting frequency changed any in the last 3-5 years?
3. Are there any issues that make texting difficult for you?
4. Should there be any limits to when and where you can and cannot text?
5. What do you foresee happening with texting in the next 5 years?
6. What is your principle use/purpose for texting?
7. Is there anything else you would like to add regarding texting?

For some respondents and for various some questions, additional probing questions were asked in order to get more lengthy and in-depth responses. The answers to these questions were tallied and summarized into general categories for further analysis.

After posing these questions to all interviewees, two specific questions for each of the generational groups excepting Generation Z were asked based upon the data findings in the quantitative analysis section. These questions were also summarized and categorized into general categories for further analysis. The common questions and summaries of the responses appear in Appendix S.

Qualitative Findings

Common Questions

The first interview question, asked to determine the commitment level of the participants in their choices for social connection between talking and texting, found the respondents' preferences were strongly related to their generational group; the oldest generational group preferred talking over texting, but this progressively changes with the age of the groups: the preference for one medium over the other is about the same in the middle, and the youngest groups indicated a strong preference for texting over talking. One Post War Silent Generation respondent stated that they preferred talking as it was more personal. Generation X members mentioned that texting had a "built-on non-repudiation", that a receiver could not deny having received a text. Several Millennials mentioned the convenience and multitasking aspect of texting, and one Generation Z indicated texting was preferable as it allowed them to more carefully consider their reply before responding. This correlates with the text messaging volumes found from the quantitative analysis indicating the volume of text message sent is strongly related to the participant's generational group and validates the findings of other researchers such as Madell and Muncer (2007), Smith (2015), and Harrison and Gilmore (2012).

The second question was asked to ascertain whether or not the respondents had changed their texting frequency, to get a feel for whether their usage has increased or decreased over the past few years. With the exception of Generation Z all generational groups reported an increase in usage. Several mentioned they had just started using texting in the past 3-5 years, and many expressed that it was almost a requirement in order to have more frequent contact with their children, who by and large preferred the texting medium. Generation Z members were split down the middle, with half indicating they have reduced their usage, and the other half indicating it has remained unchanged. This validates the research by Van Cleemput (2010), Twilio (2018), and Smith (2011).

The third question was asked to determine if there were any physical limitations or barriers to texting that the participant had experienced. The responses seem to largely depend on the age of the participant; the Post War Silent Generation members as well as the Baby Boomers complained that the physical size of the phone and its keyboard made it very easy to enter an incorrect letter, that they would sometimes have trouble finding the correct key. Progressing to Generation X, there is less complaining about the size of the interface, and more complaining about the actual usage. One interviewee complained that the constant looking down at their phone was causing some repetitive pain, an increasingly common complaint (Damasceno et al., 2018); another with a vision impairment indicated “I have a hard time seeing sometimes, so I struggle with texting when that happens, even with larger fonts” while still another complained about their own lack of knowledge regarding the common abbreviations such as LOL and IDK used in text messages. Millennials expressed zero issues or limitations, while Generation Z had no consistent responses, citing “moist hands”, “body injury”, “not having the other

persons phone number", and "can't send emotions" as their only physical limitations. The conclusion is that interface designers, while having made some incredible strides, still have some challenges in consideration of older and disabled users during the design process (Shneiderman et al., 2017) as they design smart-phone keyboard functionality.

Moving on to the fourth question, the participants were asked to state whether or not they felt there should be any limits to when and where they could text. Ostensibly, this was asked to support various survey questions regarding appropriate usage mores, but the answers provided insight into strong political feelings for one of the Generation X respondents. All generational groups except Generation Z were consistent with stating that texting while driving should not be allowed, other than one Generation X member who was felt they should not be forced to comply. Not a single Generation Z respondent mentioned driving, opting instead for restricting texting while at work or in class, while operating heavy machinery, or when talking face-to-face. The Post War Silent Generation as well as the Baby Boomers added that no one should text while walking, or while at a restaurant with others. These conclusions correspond with research by Ling (2004), Rosenberger (2013), Takao et al. (2009), Watkins et al., (2011), White et al. (2004), and Billieux (2012).

The fifth question asked the respondents to speculate what they might see happen with texting in the next five years. This was done to see how well the participants were in tune with current technology trends and directions and acted as an indicator of their overall attitude towards texting. The Post War Silent Generation were all hoping to see stronger and easier text-to-speech and speech-to-text functionality. Baby Boomers also anticipated improved text-to-speech capabilities and increased usage but expressed a

desire for additional limitations or restrictions on when and where texting activities should be allowed. Generation X seemed to really embrace the technology more than most, looking to see better integration with other applications, 3D holograms, more intense and accurate emoji's, and higher definition video support within the texting framework, all while anticipating an increased usage of the medium. The Millennials were also looking to see an increase in usage and better text-to-speech capabilities, as well as enhanced video and a direction towards Internet messaging applications that use Wi-Fi instead of the cellular network. Generation Z was also quite keen on additional capabilities, predicting hands-free eye-tracking, encrypted end-to-end messages, and Internet messaging applications to eventually replace traditional texting. This validates the work of Smith and Chaparro (2015) who considered the effectiveness of both hands-free and traditional QWERTY input methods for texting embraced by younger and older adults, and the implications to the future smart-phone designs.

The sixth question was asked in order to solicit the primary reason the respondents used the texting medium. Post War Silent Generation members indicated their primary usage was for scheduling alerts from doctors, dentists, and veterinarians, scheduling social events, and for brief communications with friends, and to a lesser extent, with family. Similarly, the Baby Boomers selected also indicated quick communications with friends and family, as well as scheduling, but added the sending and receiving of photos. Generation X cited communication with family and friends, particularly their spouse or significant other, and sometimes for communication with work-related partners. Millennials were much the same: communication was with their spouse or significant other, and with family and friends, but rarely for work. Generation

Z's responses were to the point: usage was for quick, short communications, for clarity, and for scheduling. This reinforces research by Madell and Muncer (2007), Boyd (2014) and Chan (2015).

The final common question asked of all generational groups was to simply ask if they had anything else they would like to add regarding texting. For the Post War Silent Generation, the consensus was that people should probably talk to each other more and text less, and to put aside the technical tools for a while. Some of this sentiment was echoed by the Baby Boomers, with wishes that people would text less often, that it "gets in the way of verbal communication", and that they tend to receive a lot of unwanted texts from unknown persons. Generation X was split, with most embracing it wholeheartedly and enthusiastically, but a few bemoaning the text shorthand and physical issues associated with repetitive stress from texting too much. No one from the Millennials sang any praises for the medium, with respondents indicating we should text lees than we do and not be constantly engaged with our portable devices. Only one response from Generation Z applauded text messaging, saying that is great for shy people because they feel less put "on the spot". The rest of the group felt that it was getting out of hand, that sarcasm and empathy don't translate well, and that impersonality of the medium was an issue for them. These findings reinforce previous research by Lundy and Drouin (2016), Barlow (2008), and Ortutay (2017).

Generationally Specific Questions - Post War Silent Group

It was noted from the survey data that the Post-War Silent generation reported the lowest texting interactions with their spouses or significant others than any other group, possibly due to a combination of the influence of their non-mobile lifestyles and that

most in this generational group co-habit with spouse or a common-law partner who is always proximate, that it was not necessary to use texting to any extent for to communicate with them. This was confirmed by the answers to first question for this group, asking about texting to their spouse or significant other. Responses such as "Rarely – we are always together" "we don't get out much and when we do, we are always together", and "no reason to – we are always together". The one lone dissenter indicated that texting was used only when he and his spouse were volunteering at different locations, and only sparingly then.

A second finding of the quantitative analysis showed this group sending and receiving messages with non-family members to be a higher percentage than any other generation group. When asked about this, the responses were varied in their supporting reasons but were consistent with the quantitative findings. They indicated they had few living relatives other than their spouse or significant other, whom they preferred to talk to rather than text, and their sons and daughters, to whom they texted in order to maintain communication as their offspring preferred this medium. One also added they did not have any strong family relationships. Another indicated knowing a lot of people with whom texts are occasionally exchanged, but these are "not people he would call real friends, just acquaintances, like on Facebook".

Generationally Specific Questions - Baby Boomers

Given the answers above regarding the reasons why Post War Silent Generation don't text much to their spouses or significant others, it is not surprising that their usage of the text medium for emotional support and relationship maintenance was very low. Baby Boomers also indicated low usage of the medium for these as well, leading to a

question whether or not they used text messaging for such a purpose, and if not, why not. Answers were for the most part confirmatory, that emotional support and relationship message should be conveyed in person, or at least over the phone. One whimsically responded with "I'm a guy – I don't express my feelings", and even though a single contrarian indicated they "use those emoticon things a lot", the majority indicated they avoided using texting for those purposes. This validates research by Holtzman et al. (2017), Barlow (2008), and Bian and Leung (2015).

Generationally Specific Questions - Generation X

To address the survey data showing members of Generation X having higher percentages of conversations with their spouse or significant other than any other generational group, members of this group were asked to comment. They indicated that when they were not with their significant other or spouse, they would text "all day, many times a day", and would do this before calling. None offered a specific reason as to why, but one did indicate that "we text each other to share a laugh, or coordinate activities, much more than my kids or parents do". This agrees and supports the research done by Howe and Strauss (2007) and Novak (2012).

Additional results from the quantitative analysis revealed Generation X members were substantially more likely to send or receive texts with their boss or coworkers. Initial confirmation of this through interview questions was not conclusive; half indicated substantial amount of back and forth with coworkers and bosses throughout the day, yet the other half were a strong no. However, in investigating further with follow-up questions, it was found that those who did not send or receive to coworkers or bosses could not, as they were all either homemakers, or unemployed. The unemployed

respondents further indicated that when they were working, they did, in fact, text back and forth to coworkers and bosses, and still maintained text contact with former coworkers.

Generationally Specific Questions - Millennials

The Millennials represent the largest generational group that is likely to have one or more children under 18 in their household. This generational group also has the greatest percentage of members working multiple part time jobs (2.1%), and the second highest percentage of those working part-time jobs (17.7%). Because part time workers are very often underemployed workers, scheduled for fewer hours, days, or weeks than they prefer to be working, with daily timing of their work schedules often be irregular or unpredictable, this can complicate the lives of such workers, particularly those with non-work responsibilities such as caregiving (Golden, 2015). This suggests that the need to keep in touch with family and caregivers may be more difficult for this group, prompting the question as to whether or not Millennials have any hesitations about texting family while at work. The results were unanimous, as indicated in Table 23: all participants responded that they did text with family members and caregivers while at work, with two indicating “all the time”.

Table 23. Generationally Specific Interview Questions

Generational Group	Specific Question(s)
Post War Silent Generation	Do you often exchange text messages with your spouse or significant other? Why or why not? Do you often exchange text messages with non-family members more than with your family members**?**
Baby Boomers	Do you shy away from using text messages for expressing your feelings or showing emotional support?
Generation X	Do you send/receive to /from your spouse a lot? More than others not your age? Why do you think this is? Do you send or receive a lot of texts from your boss or coworkers?
Millennials	Do you text family and friends or your children's caregiver while you are working?
Generation Z	No specific questions for this generational group

Generational Characteristics

The individual comments by the participants in the qualitative interviews help to provide a strong understanding of how the societal behaviors and social mores of each generational group have an influence on their texting habits. Tying usage behaviors to generational attitudes is problematic, and while this is not a conclusive analysis, it does show how specific generational traits seem to affect their attitudes and usage habits.

Post-War Silent Generation

Post-War Silent Generation members are often reluctant to adopt new technologies just for technology's sake, but as strong conformists, they are willing to explore new experiences, often adopting activities once those activities have become the

norm (Rosen, 2011; Underwood, 2017). Their reluctant but eventual embracing and usage behavior with the texting medium certainly supports this. They prefer to talk on the phone when there is a pre-existing friendship or close relationship, but are more prone to text with acquaintances, viewing texting as less intimate than a telephone conversation. They indicate that "many of their friends don't know how to text", and are more likely to respond to a text than to initiate one. However, in the past 3-5 years, their texting usage has increased. They "did not see a need for it a few years ago", but now agree that it is "useful and helpful, though it does seem to be happening everywhere". They have some issues with the interface, saying they "did not like phones that had physical buttons for the keys", finding it difficult to locate and press the small buttons. They believe smart phones are much easier to use but still have too small a "keyboard" and "screen that is hard to see, but don't want to carry around a larger phone". Overwhelmingly, they do not want texting to be allowed while driving at all, and would like to see less usage by persons who are walking in public, especially when crossing streets, or in restaurants, movies or religious events. Looking to the future, this generation would like more limits on when and where texting can be done, and would like to have better hands-free and text-to-speech capabilities, and to "have the phone read texts out loud". Some see a trend towards phone calls being largely replaced by texting. Their primary usage is for responding to family and friends, scheduling medical and veterinary appointments, and for getting alerts from healthcare practitioners. When asked for open thoughts regarding texting, they said "people should look up from their phone once in a while", "people need to talk to each other" and "it is a good tool for ad hoc communications".

Baby Boomers

Members of this group are agents of change, often discontent with the status quo, with strong desires to change the accepted mores and norms of society (Kitch, 2003; Howe & Strauss, 2007; Novak, 2012). They are willing to try new things when they see a need for it - they are not reluctant to embrace new technologies (Rosen, 2011). They are the first generation where having children in two-income households became the norm (Novak, 2012), placing new responsibilities on them and their children. This may speak to their embracing of technology for distance communication, especially with their children. They tend to want to talk more than they text, but the gap seems to be narrowing, and fast. Texting has increased quite a bit in the last 3-5 years, primary due to pressure from their children. Several comments support this idea, such as "My texting has increased due to my kids. They prefer texting and if I just depended on phone calls, I would probably communicate with them much less than I do now". Still, another said "My texting has increased due to my children using it so much, and for appointment reminders. My children's preferred form of distance communication is texting. Without texting I would probably not have as much contact with my children, at least not as often". Such comments are indicative of this generation – they embrace technology when they see a benefit. Some voice no issues with the smart phone interfaces while others have some problems finding the right keys, stating "My old fingers sometimes have trouble hitting the right key" and "sometimes miss the right key, but easy to correct.". Texting while driving is a strong dislike for this group, and to a lesser extent, texting in public places, during religious events, or during dinner and family meals. In looking to the future, they see few changes other than an anticipation of better text-to-speech

interfaces and hopes for a more seamless integration with other applications on their devices. Their primary purpose in using the medium is quick communications, scheduling phone calls, and sending photos, "communicating with someone, usually the kids, who can't talk on the phone right now", and "that's how I get pictures of my grandkids." Still others indicate the primary motivation for texting is to receive alerts for doctors, dentists, and sales events, in addition to communications with family. When asked for open comments, this group was split in their like or dislike of the medium, with one stating "I wish people would do it less. I think it creates some communication barriers and sometimes leads to misunderstandings. It also seems to be an addiction for some people and gets in the way of verbal communication". Another was a bit more adamant, that "junk texts should be outlawed!" Others praise it, citing it as "an easy way for people to communicate, ask easy questions, especially if the person is at work, or not is a place or position where they can talk, if you just want a simple question answered", as well as "I think it is a good way to communicate instantly with people that are not nearby. I think it is a really efficient method of communicating". One member of this group summed it up nicely saying simply "I find it's useful, yet annoying".

Generation X

This group is often very loyal to family and their local community but not to the rest of the world (Novak, 2012). They have built strong families many did not have growing up (Howe & Strauss, 2007), always available for their spouse and children (Novak, 2012), taking many family vacations and outings together, even as their children have moved into adulthood. This behavior is further demonstrated in the high percentage of texts exchanged between spouses or significant others, more than the other

generational group. This group texts and talks about the same amount, with just a slight preference for texting over talking. They are results-oriented when it comes to the integration of technology, making it no surprise they prefer texting when the conversation purpose is brief, but would prefer to talk if having a more in-depth interaction, stating "…if someone texts me, I do not call them back, I will text them back. But if I am going to go to the trouble of having a conversation with someone on the phone, I will typically talk a long time, versus keeping texts short and sweet." They definitely text more now than 5 years ago, "for work and for kids", and "primarily due to children and family, friends, and work". They do express some difficulties with the interface, with experiencing neck pains from craning down at their device so often, and having little familiarity with the commonly used acronyms. Most members of this generation would put some limits on texting while driving, save one, who stated "I should not be told what I can and cannot do". They envision increased usability with "text-to-speech and speech-to-text" and increased usage in the future, with one even indicating they felt "3D holograms and high definition video will be part of texting". Again, the purpose driven nature of this group is indicated with their primary usage of the medium for "quick communication" with spouse, family, friends, and work". When asked for open thoughts, this group had much to say, again reinforcing the utilitarian nature of this generation, "I think it is a good resource for people, a quick way" and " I think it has a purpose that is better than, more convenient, and more useful, than having a conversation", and "if you want a quick answer, it's easier for me, it doesn't take as much from me emotionally to send you a quick text, versus having a phone conversation, and going through the niceties…I like the quickness of a text".

Millennials

This generational group has a stronger sense of respect for authority and sense of duty than Generation X (Kitch, 2003; Novak, 2012). They have a very strong strength of purposes, and are focused, determined, and disciplined (Kitch, 2003; Novak, 2012; Zemke et al., 2000). This generation is very skilled at multitasking (Carrier et al., 2009; Schwieger & Ladwig, 2013). They normally have multiple windows open on their computers, check their phone for messages in meetings, send email while talking on the phone, and exchange texts at all times and places. This is supported with their preference for texting over calling, citing it to be "less disruptive for the recipient", and that it is "easier to do other things while texting", allowing the ability to "carry on multiple conversations at the same time". They still resort to calling on the phone for more in-depth communications, using the texting medium for "basic details, and save the dearth of communication for in-person interaction." Having grown up with technology, they embrace it, and generally have no issues with the latest trends; "even when driving, I use Apple Play to send and receive". They would place few limits on texting, other than requiring hands-free texting while driving, and "at work unless the task requires it". They seem to anticipate the inevitable ubiquity of wireless connectivity, and look for "more Internet-based (Wi-Fi), away from cellular connections". Some feel that the traditional phone call may decline in use, while other felt the future would show text messages declining, with "reductions in texts and a return to phone conversations" in the future. They use the media primary for quick communications with friends, spouse or significant other, family, and work. Some seem disenchanted with the medium, stating they see it "as a technology with a rapidly approaching date of obsolescence", that "it might be

better in the long run if we all stop staring at our phones as much". Others reinforce this attitude, saying "I still prefer talking over the phone. I know that the other person receives the conversation, has less confusion regarding mood or emotion of the other person, and it is faster than typing back and forth".

Generation Z

As this generational group has no suggested end date, there is as yet not sufficient definitive data concerning their societal behaviors, much of which will not truly be known until the opportunity to look back occurs sometime in the future. What is known is the environment in which they are growing up. Most have significant technology in their homes and in their bedrooms; video games and other hand-held devices (Novak, 2012). They have never known a world without computers, cell phones, or the Internet, and expect ubiquitous connectivity. It is unusual to see a member of this group without a mobile device (Lai & Hong, 2014). This constantly connected environment supports instant gratification and immediate frustration if answers are ambiguous or not instantaneous (Shatto & Erwin, 2016).

More than any of the current generations, Generation Z students learn by observation and practice, but doing rather than reading and listening to a presenter. This generational group strongly prefers texting of calling, saying "I can reply whenever I want with text messages, and can think about a response before responding", "It is to the point and doesn't rely on the other person being available or able to talk, for example, in class, meeting, and work", and "I'd rather call to get more information to them, but only after texting first". Even though a recent study indicated this group may be tiring of the constant barrage of social media communication (Ortutay, 2017), it only has a small

effect on their level of participation in text-messaging: some admit to texting a bit less as they are “tired of people texting long pieces of information, while others said they “talk a lot less now and text more.” Overall, their texting usage has not really changed much – it has always been their primary use of their smart device for communication with others. While none indicate issues with the device itself, there were some interesting comments that speak to their attitude of disenchantment, such as “My hands are usually moist, so the touch-sensitive devices are not great for me. “, “certain events such as body injury can make it difficult”, “not having the other person’s phone number can be a problem”, and “People misunderstand can’t tell emotions when texting”. Curiously, although the group indicated there should be limits on texting there was no real consensus on when and where. As they do not have as much religious identification as the other generational groups, it was not surprising that none specify issues with texting during religious events. One said texting should not be done when operating machinery, another stated that you “should not text when you are talking with someone face-to-face”, another would limit it at church, at dinner, or at family gatherings. They foresee more sophisticated texting applications to replace the current text messaging interface, “eye-tracking for the cursor”, and increased security, with “encrypted conversations that aren’t stored anywhere”. They use texting for quick communications, to “respond to a specific point” rather than for a prolonged conversation, to “clarify and explain things, to make understanding better”, and to schedule activities with their friends. Open-ended comments from this group were very diverse. One stated it is “great for shy people because they feel less ‘on the spot’”; another said “It is not perfect, since there are some limitations such as it taking a long time to send. It is still easy to use”. Another spoke to the growing disenchantment of this

group with the texting experience, mentioning that “I believe texting is getting out of hand. I much prefer talking in person”; still another thought “one issue is that translating tone of voice through text is difficult (sarcasm, empathy, etc.) I hate it. It is impersonal, and people can’t tell or read your emotions”.

Summary

In this section the objective description and analysis of the findings, results, and outcomes of the research was presented. First, the process for a data collection was discussed, beginning with the administration of the survey, examination of the raw data to remove cases due to duplication, validity of answers, and classification outliers. It was determined that a sufficient number of each generational group was present, and analysis was then performed on the final data sets. Initial reporting of the demographic breakdown of data was performed, comparing the sample to the population as a whole. It was noted that with regards to gender, after adjusting for non-binary results was within two percentage points of the national average, but that due to the nature of the sample being drawn primarily from professional contacts and college students, the educational breakdown was not reflective of the US population. Cronbach’s alpha reliability tests were conducted for the social habit constructs to determine consistency. With the exception of CUS (Contact Urgency), which showed only a moderate reliability, a medium to high reliability was found across business usage, (BUS) emotional usage (EMS), relationship maintenance (RMS), event coordination (EVS). The remaining 566 cases were then stratified to be proportional to the generational group representation in the overall population so as not to over-represent any generational groups. Table 6

illustrates this reduction within each generational group, yielding a final sample of 386 to be considered for the study. The research questions were then addressed:

RQ1: How does a person's generational group affect their text messaging usage habits?

RQ2: How does a person's generational group affect their text messaging usage habits when controlling for gender?

RQ3: How does a person's generational group affect their text messaging usage habits when controlling for employment status?

RQ4: How does a person's generational group affect their text messaging usage habits when controlling for education level?

RQ5: What are the behaviors and characteristics of the various generational groups with regard to text messaging usage habits?

The three constituent constructs of text messaging usage habits - usage volume (UV), text messaging partner choices (TMPC), and text messaging social habits (SH) were examined and described to illustrate the various habits of the participants. Next, statistical tests were done to determine how these usage habits were affected by a participant's generation group (GG). Following this, the variables for gender (GENDER), employment status (EMP), and education level (EDUC) were examined as covariates to the generational group to determine what their effect was on usage volume, text messaging partner choices and social habits. The results of these tests were then used to address the four hypotheses:

H1, an individual's text messaging usage habits and their generational group membership are significantly related is supported.

H2, an individual's text messaging usage habits and their generational group membership are significantly related when controlling for gender is not supported.

H3, an individual's text messaging usage habits and their generational group membership are significantly related when controlling for employment status is not supported.

H4, an individual's text messaging usage habits and their generational group membership are significantly related when controlling for education level is not supported.

Findings from the quantitative data were reviewed and used to guide questions for qualitative interviews. These qualitative observations, used to respond to the fifth research question, were subjected to a more in-depth analysis tying the generational groups' behaviors and attitudes from the known research to statements made by the participants in the qualitative interviews and observed quantitative data. This revealed some interesting overall group usage characteristics:

- The decision to text versus call is strongly related to the generational group; the younger the group, the more likely they are to text rather than call
- The Post-War Silent generation members reported the lowest texting interactions with their spouses or significant others, and exchanged texts with non-family members more than any other group
- Generation X members reported the greatest percentages of texting exchanges with their spouse or significant other than any other group, and engaged in conversations with co-workers more than any other groups

- Baby Boomers had very low text messaging usage indicated for emotional support and relationship maintenance
- Nearly all generations anticipated better hands-free, text-to-speech functionality in the near future, and expressed the feeling that texting was a fast and efficient way to communicate, but found it to be annoying, and getting out of hand.
- Physical issues with texting such as size of keyboard, size of screen, do appear to be somewhat related to the generational group, with most Post-War Silent Generation members and some Baby Boomers and Generation X members citing issues with the size of the keyboard and screen, and increasing neck pains
- Lastly, Generation Z members were the only group that did not indicate texting while driving should be limited or prohibited

Generational characteristics were then used to offer possible explanations and support for some generational texting behaviors. The Post-War Silent generation, often reluctant to embrace new technology slowly increased adoption of the texting medium, giving in to the desire to conform to societal norms. Baby Boomers are quicker to adopt new methods and technologies, such as texting of pictures and videos, than the previous generation. The characteristic strong family support and loyalty of Generation X is evident in their texting habits with spouse and family. The regimentation and focus of the Millennials are manifest in their texting habits, preferring the efficiency of texting rather than calling, often in a multitasking context. The participative nature of Generation Z embraces the texting environment wholeheartedly, and would impose few societal limitations on the medium's use.

Chapter 5

Conclusions, Implications, Recommendations, and Summary

Conclusions

This chapter begins with conclusions drawn from the results of this study. Each of the research questions were outlined and reviewed, and implications for the study and contributions to the body of research were discussed. The chapter ends with recommendations for future research and a summary of this investigation.

The main goal was to examine the text messaging usage habits of members of the various generational groups to determine to what extent differences and similarities may exist between users' text messaging usage habits as indicated by their messaging volume, choice of texting partners, and social habits within each generational group. The population of this study was adults between the ages of 18 and 90, and who are smart-phone users that actively use the text messaging medium.

The text messaging usage habits from 386 participants were analyzed and summarized examining usage volume (UV), choices of texting partners (TMPC), and texting in support of social habits (SH). This data was compared to the demographics of the population, summarizing counts and percentages of gender, education level, and employment status within each generational group. It was noted that sample pool was indicative of the population in terms of gender, but that similar population studies did not stratify employment data as did this study, and that the pool of surveyed participants,

having been obtained largely from academic and professional populations, may not be reflective of the population. Specific examinations and conclusions regarding the data were further examined with the research questions.

The first research question was: *How does a person's generational group affect their text messaging usage habits?* To address this a series of analyses was conducted examining each of the three constituent components of text messaging usage habits. First, the participant's overall messaging volume (UV) was examined, indicating the volume was statistically significant between the generational groups; the volume of messages exchanged was found to be directly related to the generational group membership in that the younger the generational group membership, the greater the volume of messages exchanged. Additional tests were run showing that The Post War Silent Generation had some similarity to the Baby Boomers, who showed a less significant similarity to Generation X. Next, the choice of partner for exchanging messages (TMPC) was analyzed. Statistically significant differences between the groups for nearly every category was found to exist. Only texts exchanged with non-immediate family members, texts received for weather and emergency alerts, and texts received for sales events coupons, and banking institutions were similar. It was noted that Generation X exchanges messages with their spouse or significant other much more than the other generational groups, by an average of 13% more. Further investigation of this anomaly was done through the interviews, and although confirmation of this was achieved, no specific reason was provided as to why other than sharing laughs and coordinating activities. Another finding was that of the Post-War Silent Generation, who reported the lowest number of texting interactions with their spouses or significant others. Interviews

with the members of this group indicated it was not necessary to use a texting medium because they were always together. This, combined with the fact that 73.3% of this group reported being retired, makes it largely unnecessary for them to use texting between themselves and their spouse or significant other. The third component, social habits, was then examined. Constructs representing business usage, emotional usage, relationship maintenance, event coordination, and contact urgency were reviewed. It was determined the generational group membership had strong significant influence over the social usage habits. In addition, it was discovered that Baby Boomers had very low text messaging usage indicated for emotional support and relationship maintenance. Interviews with this group confirmed this; emotional support and relationship messages are personal, and that feelings should not be shared via this medium. Further qualitative analysis determined the generational group appeared to be a determinant in the preference of texting someone as opposed to calling them on the phone, and that all generations with the exception of Generation Z have increased their use of the texting medium over the past few years and felt that texting while driving should not be allowed. Any perceived issues with the physical interface were not found to be generationally dependent. The majority of those interviewed anticipated better text-to-speech / speech-to-text applications in the near future and indicated their principal purpose behind texting was for quick communications, generally with friends and family, followed by using the medium for scheduling and appointments. In reviewing the independent comments, the consensus seems to be that text messaging is more of a necessary evil; although it is being embraced by all generations, many feel it has is gotten out of hand and would like to see it used less.

The second research question was: *How does a person's generational group affect their text messaging usage habits when controlling for gender?* Testing indicated gender was not found to be statistically significant in moderating the generational influence on the volume of messages sent and received. Lastly, the covariate effect of gender on social habits was tested, with results indicating no significant influence in moderating the effect of the generational groups. The influence of a participant's generation group on the three constituent components of text messaging usage habits (UV, TMPC, and SH) were not found to be significantly moderated by the influence of a participant's gender.

The third research question was: *How does a person's generational group affect their text messaging usage habits when controlling for employment status?* Testing indicated the effect of employment status as a covariate to the generational group was present, but not very significant; UV was still significantly influenced by the generational group despite the effect of employment status, TMPC was slightly affected, but only for those participants who were not likely to have a boss or coworker. No significant effect on SH was indicated by employment status as a covariate.

The fourth research question was: *How does a person's generational group affect their text messaging usage habits when controlling for education level?* It was found that education level as a covariate had no significant effect of the outcome when modifying generational group for UV, TMPC, or SH.

The fifth research question was: *What are the behaviors and characteristics of the various generational groups with regard to text messaging usage habits?* It was found that texting versus calling is generationally related; the younger the group, the

more likely they are to text rather than call, that Post-War Silent generation members text the least percentage with spouses or significant others, but the most with non-family members. Generation X texts the highest percentage to their spouse or significant and with co-workers, while Baby Boomers refrain from using the medium for emotional support and relationship maintenance. All generations foresee better hands-free interfaces, and embrace texting, but find it be irritating. Keyboard and screen size issues were found to be loosely associated with the generational group. Only Generation Z members did not suggest limiting texting while driving. Generational characteristics and traits were then used to explain and support some generational texting behaviors.

Implications

Texting is an essential tool for staying connected with friends, family, and romantic partners, for exchanging information, and for giving and receiving support throughout the day (Pettigrew, 2009). Generational group membership has been shown to have a significant effect on texting habits. Gender, education level, and employment status do not have a significant moderating effect on the generational group with regard to text messaging usage habits. All generational groups indicated the increased usage of the texting media over the past several years, supporting one popular theory of computer mediated communication (CMC), that of adaptive structuration theory, or AST. This theory states technology evolves in tandem with those who use it eventually resulting in changes to social rules and norms (DeSanctis & Poole, 1994). Initial users of text messaging might feel it is an abrupt or impersonal way to show or receive support; whereas, a frequent and long-time user of texting may perceive a supportive text to be

typical, expected, and perhaps even preferable to a phone call or face-to-face conversation. Analyzing the specifics of the texting habits of the participants in the context of increased usage of the texting medium across all generations provides opportunities in several areas of study and development.

First, this investigation has several implications for the existing body of knowledge in the human computer interaction field and practice. Two important contributions that this study makes to research include 1) an investigation of factors that contribute to each generational group's willingness to embrace or reject the text messaging medium and 2) an investigation into the similarities and differences in how each generation views and exploits the texting medium.

Secondly, this study indicates that text messaging has become an essential, ubiquitous, and often preferred method of communication. Although some generational groups embrace texting more than others, all are using it to some extent, and their usage is increasing. Of all the computer mediated communication (CMC) media, text messaging has evolved to be the most popular overall and points to several implications for designers of mobile communication tools, for marketers, and for public health agencies and healthcare practitioners.

Text messaging is an extremely effective marketing tool, one of the quickest ways to reach mass groups instantly. It is relatively inexpensive, requires a very minimal knowledge of technology, and already has a proven track record with regard to increasing sales. In one study, it was found that 97% of text messages are read by the phone owner, and 90% of those phone owners read the text within the first six minutes of receiving it (Thompson, 2015).

Developers may wish to address the need for better and more seamless integration of texting with other communication media, as it is often the primary media for sending video, photos, and other documents, and with other social media systems. Another development task that is indicated is stronger technological support in preventing drivers from texting while driving. Although several vendors have applications that will do this such as Cellcontrol, DriveSafeMode, and Live2Txt, these are primarily aimed at parents wanting to limit their children's ability to use the phone when driving (Shamoon, 2016). However, they are easily deactivated, and none are mandatory for adults.

The interface was mentioned by several generational groups as an obstacle by the participants. Interface designers, while having made some incredible strides, must still address many challenges when considering an older and possibly less mobile population users during the design process (Shneiderman et al., 2017). The user interface controls need to be large enough to capture fingertip actions without frustrating and alienating users with inaccurate actions or small targets. When creating devices with the end-user in mind, manufacturers should use a readable font that is at least 16 pixels, and always provide the user with the opportunity to adjust text size themselves (Redish, 2012; Usability.gov, n.d.). The same holds true for soft buttons – device interface designers should ensure buttons on touch screens are at least 9.6 millimeters diagonally, and again, can be adjusted by the users (T, 2012).

The decision to send or receive a text versus making a telephone call is strongly related to the generational group, with the younger groups preferring a text message, and the older groups preferring a phone call or face-to-face interaction. With this knowledge, commercial marketers should be able to be more effective when targeting generational

groups if their message is conveyed in the medium most preferred by that group. Similar to not shooting the messenger, an informational message sent in the wrong medium might be ignored or rejected simply because of the medium itself, or in worse-case scenario, alienate the user altogether. This may be particularly effective in getting out political messages to the right constituents. In short, organizations should not necessarily rely on text messaging to convey important information, and should ensure they understand the medium of choice for communicating with their customers.

In a similar vein, healthcare practitioners and public health departments and organizations have a responsibility to use communication channels that will reach their communities effectively, particularly in instances in which there is a benefit to the public's health. Text messaging can be very effective in increasing alert interventions to improve health outcomes, but not all clients want to be informed in this manner. In a recent study it was determined that texting is a common method used by General Practitioners (GPs) to communicate with their patients, but that not all GPs were receptive to this medium (Leahy et al., 2017), and the same is true of their patients. Again, knowing which medium is likely to be received most positively and in a timely fashion has the potential to be a powerful tool to improve health and well-being of the clientele.

Recommendations

Several areas for future research were identified. Factors associated with determining a participant's text messaging partner choices should be investigated with more finite component constructs to better identify the specific reasons behind the various choices

made by each generation. More work is needed in investigating other anomalies, such as why do members of Generation X exchange messages with their spouses more often than any other generational group, and why don't members of Generation Z consider putting limits on texting while driving? This study could be replicated in other environments where the education levels are more on par with the overall populations. This would give a more accurate representations as to the moderating effect of education levels on generational groups' text messaging usage habits. Another avenue for future study is to obtain parental consent to interview younger members of Generation Z to get a better overall representation of this generational group's true feelings. Additional research on how different smart phone types and interface affect the answer of the questions, particularly those regarding physical issues with texting and anticipated future developments. Similar research should be done in other countries, specifically non-Western countries, where texting is more popular, such as the Philippines (Lichauco, 2017) for a better global perspective, and more globally generalizable study. The effect of employment status on TMPC and the BUS construct for SH indicated two partner choices, the exchanging of messages with coworkers or bosses, and texting for business purposes were affected. This may be due to several of the employment statuses such as retired or unemployed not normally having a coworker or boss element associated with them, essentially "non-employment" statuses. Future studies may wish to either eliminate these partners or statuses from consideration, or pursue similar research without Generation Z or the Post-War Silent Generation to get a better comparison with regard to partner selection. Finally, additional research on how different smart phone types and interfaces affect the answering of the questions, particularly those questions pertaining to

physical issues with texting and the anticipated future device development should also be considered.

Summary

This dissertation investigation addressed the similarities and differences in text messaging usage habits, purposes, and level of involvement in support of social connections differentiated by the five of the commonly designated generational groups in America; the Post-War Silent Generation, Baby Boomers, Generation X, Millennials, and Generation Z. Researchers such as Koutamanis et al. (2013), Reid and Reid (2007), and Valkenburg and Peter (2011) all cite the usage of the text messaging media for the maintenance of social connections, while researchers such as Boyd (2014), Boot et al. (2015), Gell et al. (2015), Zhou et al. (2014), and Smith and Chaparro (2015) found the medium to be popular across all ages. However, there still remained some question as to the extent and disparity between generations on the adoption and specific usages of the medium, and to what extent, if any, gender, employment status, and education level had on the generational outcomes. Although every generational age group participates in text messaging on smart devices, there exists insufficient specific research exploring similarities and differences in text messaging usage habits. While the Post-War Silent Generation and Baby Boomers ushered in the computing revolution, Millennials were exposed to technology early in life, and members of Generation Z have never known life without the Internet or mobile smart devices (Carrier et al., 2009; Kitch, 2003; Novak, 2012; Shatto & Erwin, 2016). The scant existing research is contradictory, inconsistent, dated, and inconclusive. To further investigate this, the usage habits and patterns of the

various generations among the population were examined and compared. Following a comprehensive literature review, three factors were identified as components of the text messaging usage habits: purpose and urgency, choice of texting partners, and messaging volume.

Purpose can be roughly categorized into four general usage groups: business usage, emotional support usage, maintenance of relationships, and coordination of social activities. Research has previously shown the use of technology in support of social communications for purposes of satisfaction or gratification (Auter 2007; Boyd 2014; Grellhesl & Punyanunt-Carter 2012; Hall & Baym 2012; Lepp et al. 2014; Quan-Haase & Young 2010; Caughlin, J, Basinger, E., & Sharabi, 2016). Other researchers such as Skierkowski and Wood (2012), Perry and Werner-Wilson (2011), Barlow (2008), and Van Cleemput (2008) have shown the reliance on the texting medium for relationship maintenance and emotional support. Further research shows the employment of the medium for business and organizational purposes, such as event notifications, health and other calendar reminders, confirmations, and weather or other emergency notifications (Perron et al., 2013; Nglazi et al., 2013; Zurovac et al., 2012; Dickinger et al., 2004), and to schedule and coordinate life events (Campbell & Kelley, 2006; Ling, 2004; Copeland-Welp, 2013). Urgency, more specifically the social sense of urgency, has been addressed somewhat by recent research. Recent studies show nearly all texts will be read within three minutes of being sent (Cohen-Sheffer, 2017), but research into factors that determine quickness of response are mixed, and largely not peer-reviewed.

Research into people's selection text messaging partners is scant. Forgays, Hymnam, and Schrieber (2013) analyzed gender and age differences, categorizing

contact and frequency among friends, and romantic partners across gender and age, but did not account for texting with other family members, co-workers, bosses, or receiving alerts or appointment notifications. There is very little other research specifically addressing text messaging partner choices. Additional research into text messaging partner choices is indicated.

Research into text messaging volume has been done by several services (Pew Research, 2017; Experian Marketing Services, 2017; Twilio, 2013), but are inconsistent, and are not using the five generational group designations for grouping the age of the participants. A mixed methods study was conducted in order to examine the text messaging usage habits of members of the various generational groups to determine to what extent differences and similarities may exist as indicated by their messaging volume, choice of texting partners, and social habits within each generational group. The quantitative portion of this study undertook to answer five research questions:

1. *How does a person's generational group affect their text messaging usage habits?*
2. *How does a person's generational group affect their text messaging usage habits when controlling for gender?*
3. *How does a person's generational group affect their text messaging usage habits when controlling for employment status?*
4. *How does a person's generational group affect their text messaging usage habits when controlling for education level?*
5. *What are the behaviors and characteristics of the various generational groups with regard to text messaging usage habits?*

In order to address these specific research questions, a survey instrument was developed and participation was solicited input from multiple input sources: a collegiate pool, a social media pool, the extended networks of both pools, and the employment of a professional survey service, which ensured a sufficient number of generational group responses. 386 valid responses were used for final input to the quantitative analysis section. Results from the quantitative analysis provided answers to the four research questions and led to several other conclusions further examined in a qualitative analysis, semi-structured interviews with 25 participants across the five generational groups.

Results of the quantitative analysis indicated the generational group had a statistically significant influence over a participant's messaging volume (UV), text messaging partner choices (TMPC) with the exception of engaging non-immediate family members, and social habits (SH). Gender, education level, and employment status were not found to modify generational group membership when looking at text messaging usage habits. Findings from the quantitative data combined with the answers received from the semi-structured interview questions were reviewed and used to guide questions for the qualitative interviews, some common to all groups, and some specific to the generational groups. The quantitative findings and qualitative observations to address the fifth research question revealed some interesting group usage characteristics:

- The Post-War Silent generation members reported the lowest texting interactions with their spouses or significant others.
- The Post-War Silent Generation members exchanged texts with non-family members more than any other group.

- Generation X members reported the greatest percentages of texting exchanges with their spouse or significant other than any other group.
- Generation X members texted with co-workers more than any other groups.
- Baby Boomers had very low text messaging usage indicated for emotional support and relationship maintenance.
- Generation Z members were the only group that did not indicate texting while driving should be limited or prohibited.
- Nearly all generations anticipated better hands-free, text-to-speech functionality in the near future.
- The decision to text versus call is strongly related to the generational group, with older groups preferring to talk, but the inclination to text rather than call increases as the age of the group becomes younger.
- Physical issues with texting such as size of keyboard, size of screen, do not appear to be related to the generation group.
- All generations expressed the feeling that texting was a fast and efficient way to communicate, but found it to be annoying, and getting out of hand.
- Some generational texting behaviors may be supported, influenced or explained by generational characteristics.

Following the analyses, the results and conclusions were validated with existing research. Contributions to the existing body of knowledge in the human computer interaction field and practice were discussed, including an investigation of factors that contribute to each generational group's willingness to embrace or reject the text messaging medium and an investigation into the similarities and differences in how each generation views and

exploits the texting medium. As a very popular computer mediated communication (CMC) media, text messaging is one of the most prevalent, which suggestions for designers of mobile communication tools, for marketers, and for public health agencies and healthcare practitioners. The need for better integration of texting with other social media systems was indicated, as well as the need for stronger technological support in preventing drivers from texting while driving. Healthcare practitioners and public health departments should take into consideration the preferences of their user base and use a medium that is likely to be received positively and effectively to improve health and well-being of those they serve. Interface designers may want to consider the aging population in their designs, to compensate for increasingly limited mobility and visibility future smart device designs. Several implications for future research were acknowledged, such as the need to better identify factors associated with determining text messaging partner choices. The found anomalies with regard the habits of Generation X with their spouses, and the texting while driving concern with regard to Generation Z should be investigated further. Research in other countries and with a sample population more closely aligned with the population as a whole would make the study more globally generalizable. Future studies may wish to eliminate TMPC selections for coworkers and bosses, or remove the BUS construct of SH, or eliminate Generation Z or the Post-War Silent Generation for a more accurate depiction of TMPC and business use. These recommendations for future research in the design and use of smart device interfaces will build on this research and extend the body of knowledge in the area of Human–computer interaction. Finally, a larger sample proportional to the generational groups in the population may yield a more accurate dataset for analysis.

Appendix A

Text Messaging Questionnaire

Many thanks to you for taking the time to participate in this study of how mobile text messaging is being used to stay connected with others. By consenting to participate in this study you affirm that you currently use text-messaging on a mobile device, are willing to provide your year of birth, and agree to have your information analyzed presented, and published. All anonymity will be preserved; no actual names will be used, or any other methods to be able to identify a specific individual.

If you are interested in seeing the results of this research, please send a separate e-mail to TMSurvey@twc.com, and the final analysis will be forwarded to you upon completion. You may opt out at any time during this survey.

1) Do you participate in text-messaging ("texting") from your cellular phone?
   ____ Yes ____No

2) Are you at least 18 years of age?
   ____ Yes ____No

   (Please note: if you selected "No", to either of the first two questions, you may stop now – you do not meet the minimum criteria for this study

3) On the average, how many text-messages do you send per day? (please note, this refers to each individual message/photo/video, not extended text messaging conversations)
   ____ 1-10
   ____ 11-25
   ____ 26-100
   ____ 101-250
   ____ More than 250

4) On the average, how many text-messages do you receive per day? (please note, this refers to each individual message/photo/video, not extended text messaging conversations)
   ____ 1-10

____ 11-25
____ 26-100
____ 101-250
____ More than 250

5) Who do you most often **send** text messages to?
Please check all that apply.
____ Coworker / boss
____ Daughter(s)
____ Father
____ Friends
____ Mother
____ Significant other / spouse
____ Son(s)
____ Other Family Members
____ Others

6) Who do you most often **receive** text messages from?
Please check all that apply.
____ Coworker / boss
____ Daughter(s)
____ Doctor, dentist, or other medical practitioners
____ Events / Sales / Banks /
____ Father
____ Friends
____ Mother
____ Significant other / spouse
____ Son(s)
____ Weather / Emergency alerts
____ Other Family Members
____ Others

Please circle one number best describing your perception of your text messaging usage, using the following scale: 1-never, 2-rarely, 3-sometimes, 4-often, 5-always

7. I text others about how I am doing
Never 1 2 3 4 5 Always
8. I text to chat and kill time with others
Never 1 2 3 4 5 Always
9. I text others to let them know I care about them
Never 1 2 3 4 5 Always
10. I respond to text messages within 1 minute

Never 1 2 3 4 5 Always

11. I receive ads, coupons, sale information, and weather/traffic alerts through texting
    Never 1 2 3 4 5 Always

12. I text others during religious sermons or solemn religious events
    Never 1 2 3 4 5 Always

13. I text people to clarify things in our last face-to-face conversation
    Never 1 2 3 4 5 Always

14. I text others just to say hello
    Never 1 2 3 4 5 Always

15. I text to arrange time and place to meet
    Never 1 2 3 4 5 Always

16. I text others to arrange time for a voice call
    Never 1 2 3 4 5 Always

17. I share ads and business promotional messages through texting
    Never 1 2 3 4 5 Always

18. I text to show my support when others are having difficult times
    Never 1 2 3 4 5 Always

19. I text others my appreciation for their help
    Never 1 2 3 4 5 Always

20. I text others during a public event (concerts, movies, plays)
    Never 1 2 3 4 5 Always

21. I text my colleagues to talk about work
    Never 1 2 3 4 5 Always

22. I send texts of holiday messages whenever there are holidays
    Never 1 2 3 4 5 Always

23. I receive texts as reminders for business and health appointments
    Never 1 2 3 4 5 Always

Demographic Questions:

24. What year were you born? _____ (Leave blank if you prefer not to answer)

25. Gender:
    ____ Male
    ____ Female
    ____ Other
    ____ Prefer not to answer

26. What is your current employment status: (**Please select only one answer which best describes your situation**)
____ Work full-time (40 or more hours per week)
____ Work part-time
____ Work at least 40 hours per week at more than 1 job
____ Retired
____ Volunteer
____ Homemaker
____ Home or resident primary caregiver
____ I am currently seeking employment
____ Unemployed, not seeking employment
____ Prefer not to answer

27. What is/was your primary occupation? (leave blank if you prefer not to answer)
_____

28. What is the highest education level you have completed?
____ Less than High School /GED
____ High school graduate or GED
____ Some college / 2-year degree
____ 4-year college graduate
____ Master's degree
____ Terminal Degree (PhD, EdD, DMin, JSD, etc.)
____ Prefer not to answer

Appendix B

Semi-Structured Interview Script and Initial Questions

Your time in participating in this study is very much appreciated. As a reminder, this study is concerned with how mobile text messaging is being used to stay connected with others. We are meeting to conduct a one-on-one interview to better understand your experiences using mobile text messaging as well as the ways you visualize using it in the future. This interview will be transcribed to ensure your answers are accurately reflected in the data collection.

Before we begin, please take your time to read the following information sheet and sign the consent form. By consenting to participate in this study you affirm that you currently use text-messaging on a mobile device, will provide your year of birth, and agree to have your answers transcribed, as well as to allow the information to be analyzed, presented, and published. All anonymity will be preserved; no actual names will be used, or any other methods to be able to identify a specific individual.

Thank you.

1) Would you say you text more than you talk on your mobile device? Why or why not?)

2) Has your texting frequency changed any in the last 3-5 years? How?

3) Are there any physical or technical issues that make texting difficult for you?

4) Should there be any limits as to when and where you can and cannot text? Such as?

5) What do you foresee happening in the world of texting within the next 5 years?

6) What would you say is your principle use or purpose for texting?

7) Is there anything else you would like to add regarding texting?

(1-2 additional questions may be asked depending on the participants Generational Group)

That covers everything - Thank you so much for helping with this research study. It is greatly appreciated.

Appendix C

Nova Southeastern University Institutional Review Board Approval Letter

NOVA SOUTHEASTERN UNIVERSITY
Institutional Review Board

MEMORANDUM

To: **Daniel Long**

From: **Ling Wang, Ph.D.,**
Center Representative, Institutional Review Board

Date: **October 4, 2017**

Re: **IRB #: 2017-584; Title, "Exploring Generational Differences in Text Messaging Usage and Habits**

A dissertation proposal submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Information Systems"

I have reviewed the above-referenced research protocol at the center level. Based on the information provided, I have determined that this study is exempt from further IRB review under **45 CFR 46.101(b) (Exempt Category 2)**. You may proceed with your study as described to the IRB. As principal investigator, you must adhere to the following requirements:

1) CONSENT: If recruitment procedures include consent forms, they must be obtained in such a manner that they are clearly understood by the subjects and the process affords subjects the opportunity to ask questions, obtain detailed answers from those directly involved in the research, and have sufficient time to consider their participation after they have been provided this information. The subjects must be given a copy of the signed consent document, and a copy must be placed in a secure file separate from de-identified participant information. Record of informed consent must be retained for a minimum of three years from the conclusion of the study.

2) ADVERSE EVENTS/UNANTICIPATED PROBLEMS: The principal investigator is required to notify the IRB chair and me (954-262-5369 and Ling Wang, Ph.D., respectively) of any adverse reactions or unanticipated events that may develop as a result of this study. Reactions or events may include, but are not limited to, injury, depression as a result of participation in the study, life-threatening situation, death, or loss of confidentiality/anonymity of subject. Approval may be withdrawn if the problem is serious.

3) AMENDMENTS: Any changes in the study (e.g., procedures, number or types of subjects, consent forms, investigators, etc.) must be approved by the IRB prior to implementation. Please be advised that changes in a study may require further review depending on the nature of the change. Please contact me with any questions regarding amendments or changes to your study.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

Cc: Maxine Cohen, Ph.D.
Ling Wang, Ph.D.

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Appendix D

Participant Letter for Anonymous Survey
NSU Consent to be in a Research Study Entitled

Exploring Generational Differences in Text Messaging Usage and Habits

Who is doing this research study?

This person doing this study is Daniel W. Long with the College of Engineering and Computing. He will be guided by Dr. Maxine Cohen.

Why are you asking me to be in this research study?

You are being asked to take part in this research study because you are between the ages of 18-90 and use smart phone or mobile device to send and/or receive text messages.

Why is this research being done?

The purpose of this study is to assess and compare the usage of the text messaging medium in support of social relationship maintenance across various generations, to better understand the similarities and differences in generational usage habits in support of the fulfillment of social needs.

What will I be doing if I agree to be in this research study?

You will be taking a one-time, anonymous survey. The survey will take approximately 5 minutes to complete.

Are there possible risks and discomforts to me?

This research study involves minimal risk to you. To the best of our knowledge, the things you will be doing have no more risk of harm than you would have in everyday life.

What happens if I do not want to be in this research study?

You can decide not to participate in this research and it will not be held against you. You can exit the survey at any time.

Will it cost me anything? Will I get paid for being in the study?

There is no cost for participation in this study. Participation is voluntary and no payment will be provided.

How will you keep my information private?

Your responses are anonymous. Information we learn about you in this research study will be handled in a confidential manner, within the limits of the law. There is no sign-on requirement. Participants will be identified with a case number only; no other identification will be used. This anonymous data will be available to the researcher, the Institutional Review Board and other representatives of this institution, and any granting agencies (if applicable). All confidential data will be kept securely on a password protected encrypted USB device to be stored in the research's safe deposit box for a period of 36 months. All data will be kept for 36 months and destroyed after that time by erasing and reformatting the USB drive.

Who can I talk to about the study?

If you have questions, you can contact Daniel W. Long at (239)-249-1568 or via email at dl11245@mynsu.nova.edu or Dr. Maxine Cohen at cohenm@nova.edu.

If you have questions about the study but want to talk to someone else who is not part of the study, you can call the Nova Southeastern University Institutional Review Board (IRB) at (954) 262-5369 or toll free at 1-866-499-0790 or email at IRB@nova.edu.

Do you understand and do you want to be in the study?

If you have read the above information and voluntarily wish to participate in this research study, please click on the link below to begin the survey, otherwise, you may exit at any time.

Survey Link

Appendix E

Invitation to Participate in Telephone Interview

This invitation highlights the research that I as a doctoral candidate am conducting at Nova Southeastern University. There are a number of functions that we used text-messaging to support: real time conversations, information sharing, scheduling meetings, showing support, quick communication, etc. This research will help practitioners and researchers understand the roles that generational groups may play in affecting our text messaging usage habits.

If you have previously completed my online survey and would be willing to participate in a brief phone interview, continue; otherwise you may ignore the rest of this message.

The interview will consist of 6-8 questions regarding your use of the text-messaging medium, which should take no longer than 10-15 minutes. All responses will be kept completely confidential, and you have the right to participate or to withdraw at any time, without penalty. There are no costs to you or payments made for participating in this study.

To indicate your voluntary participation in the study and consent to be interviewed, please review the consent form on the following page. If you then choose to participate, please reply to me at dl1145@mynsu.nova.edu with your telephone number, and an indication of a preferred date/time to call. Responding with your phone number to this e-mail indicates your consent to be interviewed. It is desired to have all responses by **(Insert Date Here)**

Should you have any questions or concerns, you may contact me at dl1145@mynsu.nova.edu or by phone at 239-249-1568.

Thank you in advance for helping with this important research study.

Daniel Long
Dl1145@mynsu.nova.edu
Doctoral Candidate
Nova Southeastern University

Appendix F

Participant Letter for Telephone Interview
NSU Consent to be in a Research Study Entitled

Exploring Generational Differences in
Text Messaging Usage and Habits

Who is doing this research study?

This person doing this study is Daniel W. Long with the College of Engineering and Computing under the supervision of Dr. Maxine Cohen.

Why are you asking me to be in this research study?

You are being asked to take part in this research study because you are between the ages of 18-90, use a smart phone or mobile device to send and/or receive text messages, and have previously completed my online survey regarding text messaging...

Why is this research being done?

The purpose of this study is to assess and compare the usage of the text messaging medium in support of social relationship maintenance across various generations, to better understand the similarities and differences in generational usage habits in support of the fulfillment of social needs

What will I be doing if I agree to be in this research study?

You will be interviewed via telephone and asked to respond to questions regarding your usage and purposes for using text messaging. The interview will take approximately 10-15 minutes to complete.

Are there possible risks and discomforts to me?

This research study involves minimal risk to you. To the best of our knowledge, the things you will be doing have no more risk of harm than you would have in everyday life. This research has been approved by the Institutional Review Board (IRB) of Nova Southeastern University (NSU)

What happens if I do not want to be in this research study?

You can decide not to participate in this research and it will not be held against you. You can exit the interview at any time.

Will it cost me anything? Will I get paid for being in the study?

There is no cost for participation in this study. Participation is voluntary and no payment will be provided.

How will you keep my information private?

Your responses are anonymous. Information we learn about you in this research study will be handled in a confidential manner, within the limits of the law. The interview is administered using a telephone, but the call will not be recorded. There is no sign-on requirement. Participants will be identified with a case number only; no other identification will be used, and the phone numbers and will be removed. This anonymous data will be available to the researcher, the Institutional Review Board and other representatives of this institution, and any granting agencies (if applicable). All confidential data will be kept securely on a password protected encrypted USB device to be stored in the research's safe deposit box for a period of 36 months. All data will be kept for 36 months and destroyed after that time by erasing and reformatting the USB drive.

Who can I talk to about the study?

If you have questions, you can contact Daniel W. Long at (239)-249-1568 or via email at dl11245@mynsu.nova.edu or Dr. Maxine Cohen at cohenm@nova.edu

If you have questions about the study but want to talk to someone else who is not part of the study, you can call the Nova Southeastern University Institutional Review Board (IRB) at (954) 262-5369 or toll free at 1-866-499-0790 or email at IRB@nova.edu.

Do you understand and do you want to be in the study?

If you have read the above information and voluntarily wish to participate in this research study, please return this form to dl11245@mynsu.nova.edu with the subject line of "I consent", and your phone number in the body of the e-mail.

Appendix G

Between Group Comparisons of Generational Group (GG) on Usage Volume (UV)

Dependent Variable: **UV**

Scheffé

(I) **GG**	(J) **GG**	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
1	2	-.53	.396	.771	-1.76	.69
	3	-1.04	.416	.184	-2.33	.25
	4	-2.09*	.393	.000	-3.30	-.87
	5	-2.79*	.389	.000	-3.99	-1.58
2	1	.53	.396	.771	-.69	1.76
	3	-.51	.310	.612	-1.47	.45
	4	-1.56*	.278	.000	-2.42	-.69
	5	-2.26*	.273	.000	-3.10	-1.41
3	1	1.04	.416	.184	-.25	2.33
	2	.51	.310	.612	-.45	1.47
	4	-1.05*	.307	.022	-2.00	-.10
	5	-1.75*	.302	.000	-2.68	-.81
4	1	2.09*	.393	.000	.87	3.30
	2	1.56*	.278	.000	.69	2.42
	3	1.05*	.307	.022	.10	2.00
	5	-.70	.269	.152	-1.53	.13
5	1	2.79*	.389	.000	1.58	3.99
	2	2.26*	.273	.000	1.41	3.10
	3	1.75*	.302	.000	.81	2.68
	4	.70	.269	.152	-.13	1.53

Based on observed means.

The error term is Mean Square (Error) = 3.622.

*. The mean difference is significant at the .05 level.

Appendix H

Between Group Comparisons of GG on TMPC

Scheffé							
			Mean			95% Confidence Interval	
Dependent Variable	(I) GG	(J) GG	Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
SCOB	1	2	-.21	.089	.236	-.49	.07
		3	-.29*	.094	.044	-.58	.00
		4	-.21	.088	.247	-.48	.07
		5	-.13	.088	.712	-.40	.14
	2	1	.21	.089	.236	-.07	.49
		3	-.08	.070	.832	-.30	.13
		4	.00	.063	1.000	-.19	.20
		5	.08	.061	.773	-.11	.27
	3	1	.29*	.094	.044	.00	.58
		2	.08	.070	.832	-.13	.30
		4	.09	.069	.801	-.13	.30
		5	.17	.068	.199	-.04	.38
	4	1	.21	.088	.247	-.07	.48
		2	.00	.063	1.000	-.20	.19
		3	-.09	.069	.801	-.30	.13
		5	.08	.061	.794	-.11	.27
	5	1	.13	.088	.712	-.14	.40
		2	-.08	.061	.773	-.27	.11
		3	-.17	.068	.199	-.38	.04
		4	-.08	.061	.794	-.27	.11
SD	1	2	-.18	.080	.262	-.43	.06
		3	.01	.084	1.000	-.25	.27
		4	.27*	.079	.021	.03	.52
		5	.31*	.079	.005	.06	.55
	2	1	.18	.080	.262	-.06	.43
		3	.19*	.063	.049	.00	.39
		4	.46*	.056	.000	.28	.63
		5	.49*	.055	.000	.32	.66
	3	1	-.01	.084	1.000	-.27	.25
		2	-.19*	.063	.049	-.39	.00
		4	.26*	.062	.002	.07	.45
		5	.30*	.061	.000	.11	.48
	4	1	-.27*	.079	.021	-.52	-.03

		2	-.46*	.056	.000	-.63	-.28
		3	-.26*	.062	.002	-.45	-.07
		5	.04	.054	.981	-.13	.20
	5	1	-.31*	.079	.005	-.55	-.06
		2	-.49*	.055	.000	-.66	-.32
		3	-.30*	.061	.000	-.48	-.11
		4	-.04	.054	.981	-.20	.13
SFA	1	2	-.03	.069	.994	-.25	.18
		3	-.08	.073	.885	-.30	.15
		4	-.16	.069	.270	-.37	.06
		5	-.30*	.068	.001	-.51	-.09
	2	1	.03	.069	.994	-.18	.25
		3	-.05	.054	.952	-.21	.12
		4	-.12	.049	.170	-.27	.03
		5	-.27*	.048	.000	-.41	-.12
	3	1	.08	.073	.885	-.15	.30
		2	.05	.054	.952	-.12	.21
		4	-.08	.054	.712	-.24	.09
		5	-.22*	.053	.002	-.38	-.06
	4	1	.16	.069	.270	-.06	.37
		2	.12	.049	.170	-.03	.27
		3	.08	.054	.712	-.09	.24
		5	-.14	.047	.060	-.29	.00
	5	1	.30*	.068	.001	.09	.51
		2	.27*	.048	.000	.12	.41
		3	.22*	.053	.002	.06	.38
		4	.14	.047	.060	.00	.29
SFR	1	2	-.23	.095	.224	-.52	.07
		3	-.29	.100	.089	-.60	.02
		4	-.35*	.095	.008	-.65	-.06
		5	-.45*	.094	.000	-.74	-.16
	2	1	.23	.095	.224	-.07	.52
		3	-.06	.075	.962	-.29	.17
		4	-.13	.067	.474	-.33	.08
		5	-.23*	.066	.021	-.43	-.02
	3	1	.29	.100	.089	-.02	.60
		2	.06	.075	.962	-.17	.29
		4	-.07	.074	.933	-.30	.16
		5	-.17	.073	.263	-.39	.06
	4	1	.35*	.095	.008	.06	.65

		2	.13	.067	.474	-.08	.33
		3	.07	.074	.933	-.16	.30
		5	-.10	.065	.672	-.30	.10
	5	1	.45*	.094	.000	.16	.74
		2	.23*	.066	.021	.02	.43
		3	.17	.073	.263	-.06	.39
		4	.10	.065	.672	-.10	.30
SM	1	2	-.04	.085	.992	-.31	.22
		3	-.23	.090	.147	-.51	.04
		4	-.42*	.085	.000	-.68	-.15
		5	-.59*	.084	.000	-.85	-.33
	2	1	.04	.085	.992	-.22	.31
		3	-.19	.067	.089	-.40	.02
		4	-.37*	.060	.000	-.56	-.19
		5	-.54*	.059	.000	-.72	-.36
	3	1	.23	.090	.147	-.04	.51
		2	.19	.067	.089	-.02	.40
		4	-.18	.066	.109	-.39	.02
		5	-.35*	.065	.000	-.55	-.15
	4	1	.42*	.085	.000	.15	.68
		2	.37*	.060	.000	.19	.56
		3	.18	.066	.109	-.02	.39
		5	-.17	.058	.074	-.35	.01
	5	1	.59*	.084	.000	.33	.85
		2	.54*	.059	.000	.36	.72
		3	.35*	.065	.000	.15	.55
		4	.17	.058	.074	-.01	.35
SSOS	1	2	-.41*	.099	.002	-.72	-.10
		3	-.62*	.104	.000	-.94	-.30
		4	-.47*	.098	.000	-.78	-.17
		5	-.33*	.097	.023	-.63	-.03
	2	1	.41*	.099	.002	.10	.72
		3	-.21	.077	.120	-.45	.03
		4	-.06	.069	.931	-.28	.15
		5	.08	.068	.841	-.13	.29
	3	1	.62*	.104	.000	.30	.94
		2	.21	.077	.120	-.03	.45
		4	.15	.077	.459	-.09	.38
		5	.29*	.075	.005	.06	.52
	4	1	.47*	.098	.000	.17	.78

		2	.06	.069	.931	-.15	.28
		3	-.15	.077	.459	-.38	.09
		5	.15	.067	.325	-.06	.35
	5	1	.33*	.097	.023	.03	.63
		2	-.08	.068	.841	-.29	.13
		3	-.29*	.075	.005	-.52	-.06
		4	-.15	.067	.325	-.35	.06
SS	1	2	-.11	.079	.775	-.35	.14
		3	.01	.083	1.000	-.25	.27
		4	.18	.078	.285	-.07	.42
		5	.25*	.078	.034	.01	.49
	2	1	.11	.079	.775	-.14	.35
		3	.11	.062	.490	-.08	.31
		4	.28*	.055	.000	.11	.45
		5	.36*	.054	.000	.19	.53
	3	1	-.01	.083	1.000	-.27	.25
		2	-.11	.062	.490	-.31	.08
		4	.17	.061	.117	-.02	.36
		5	.24*	.060	.003	.06	.43
	4	1	-.18	.078	.285	-.42	.07
		2	-.28*	.055	.000	-.45	-.11
		3	-.17	.061	.117	-.36	.02
		5	.08	.054	.733	-.09	.24
	5	1	-.25*	.078	.034	-.49	-.01
		2	-.36*	.054	.000	-.53	-.19
		3	-.24*	.060	.003	-.43	-.06
		4	-.08	.054	.733	-.24	.09
SOFM	1	2	-.03	.104	.999	-.35	.29
		3	.08	.109	.973	-.26	.41
		4	.11	.103	.891	-.21	.43
		5	-.02	.102	1.000	-.33	.30
	2	1	.03	.104	.999	-.29	.35
		3	.11	.081	.765	-.14	.36
		4	.14	.073	.439	-.08	.37
		5	.02	.071	1.000	-.20	.24
	3	1	-.08	.109	.973	-.41	.26
		2	-.11	.081	.765	-.36	.14
		4	.03	.080	.997	-.22	.28
		5	-.09	.079	.843	-.34	.15
	4	1	-.11	.103	.891	-.43	.21

		2	-.14	.073	.439	-.37	.08
		3	-.03	.080	.997	-.28	.22
		5	-.13	.070	.534	-.34	.09
	5	1	.02	.102	1.000	-.30	.33
		2	-.02	.071	1.000	-.24	.20
		3	.09	.079	.843	-.15	.34
		4	.13	.070	.534	-.09	.34
SO	1	2	.20	.072	.100	-.02	.42
		3	.21	.076	.093	-.02	.45
		4	.25*	.071	.016	.03	.47
		5	.25*	.071	.016	.03	.47
	2	1	-.20	.072	.100	-.42	.02
		3	.01	.056	1.000	-.16	.19
		4	.05	.051	.915	-.11	.21
		5	.05	.050	.919	-.11	.20
	3	1	-.21	.076	.093	-.45	.02
		2	-.01	.056	1.000	-.19	.16
		4	.04	.056	.980	-.14	.21
		5	.03	.055	.982	-.14	.20
	4	1	-.25*	.071	.016	-.47	-.03
		2	-.05	.051	.915	-.21	.11
		3	-.04	.056	.980	-.21	.14
		5	.00	.049	1.000	-.15	.15
	5	1	-.25*	.071	.016	-.47	-.03
		2	-.05	.050	.919	-.20	.11
		3	-.03	.055	.982	-.20	.14
		4	.00	.049	1.000	-.15	.15
RCOB	1	2	-.10	.085	.842	-.36	.16
		3	-.26	.089	.073	-.54	.01
		4	-.14	.084	.582	-.40	.12
		5	-.07	.084	.959	-.33	.19
	2	1	.10	.085	.842	-.16	.36
		3	-.16	.067	.211	-.37	.04
		4	-.04	.060	.975	-.23	.14
		5	.03	.059	.987	-.15	.22
	3	1	.26	.089	.073	-.01	.54
		2	.16	.067	.211	-.04	.37
		4	.12	.066	.510	-.08	.32
		5	.20	.065	.060	-.01	.40
	4	1	.14	.084	.582	-.12	.40

		2	.04	.060	.975	-.14	.23
		3	-.12	.066	.510	-.32	.08
		5	.08	.058	.785	-.10	.26
	5	1	.07	.084	.959	-.19	.33
		2	-.03	.059	.987	-.22	.15
		3	-.20	.065	.060	-.40	.01
		4	-.08	.058	.785	-.26	.10
RD	1	2	-.17	.079	.310	-.42	.07
		3	.04	.083	.992	-.21	.30
		4	.27*	.078	.018	.03	.51
		5	.32*	.078	.003	.08	.56
	2	1	.17	.079	.310	-.07	.42
		3	.21*	.062	.018	.02	.41
		4	.44*	.055	.000	.27	.62
		5	.49*	.054	.000	.32	.66
	3	1	-.04	.083	.992	-.30	.21
		2	-.21*	.062	.018	-.41	-.02
		4	.23*	.061	.008	.04	.42
		5	.27*	.060	.000	.09	.46
	4	1	-.27*	.078	.018	-.51	-.03
		2	-.44*	.055	.000	-.62	-.27
		3	-.23*	.061	.008	-.42	-.04
		5	.04	.054	.951	-.12	.21
	5	1	-.32*	.078	.003	-.56	-.08
		2	-.49*	.054	.000	-.66	-.32
		3	-.27*	.060	.000	-.46	-.09
		4	-.04	.054	.951	-.21	.12
RFA	1	2	-.03	.068	.994	-.24	.18
		3	-.08	.072	.880	-.30	.14
		4	-.15	.068	.327	-.36	.06
		5	-.29*	.067	.001	-.50	-.08
	2	1	.03	.068	.994	-.18	.24
		3	-.05	.053	.949	-.21	.12
		4	-.11	.048	.237	-.26	.04
		5	-.26*	.047	.000	-.40	-.11
	3	1	.08	.072	.880	-.14	.30
		2	.05	.053	.949	-.12	.21
		4	-.07	.053	.801	-.23	.10
		5	-.21*	.052	.003	-.37	-.05
	4	1	.15	.068	.327	-.06	.36

		2	.11	.048	.237	-.04	.26
		3	.07	.053	.801	-.10	.23
		5	-.14	.046	.052	-.29	.00
	5	1	.29*	.067	.001	.08	.50
		2	.26*	.047	.000	.11	.40
		3	.21*	.052	.003	.05	.37
		4	.14	.046	.052	.00	.29
RFR	1	2	-.06	.100	.980	-.37	.24
		3	-.08	.105	.965	-.40	.24
		4	-.17	.099	.546	-.48	.13
		5	-.32*	.098	.034	-.62	-.01
	2	1	.06	.100	.980	-.24	.37
		3	-.01	.078	1.000	-.26	.23
		4	-.11	.070	.663	-.33	.11
		5	-.25*	.069	.010	-.47	-.04
	3	1	.08	.105	.965	-.24	.40
		2	.01	.078	1.000	-.23	.26
		4	-.09	.077	.831	-.33	.15
		5	-.24*	.076	.046	-.47	.00
	4	1	.17	.099	.546	-.13	.48
		2	.11	.070	.663	-.11	.33
		3	.09	.077	.831	-.15	.33
		5	-.14	.068	.341	-.35	.07
	5	1	.32*	.098	.034	.01	.62
		2	.25*	.069	.010	.04	.47
		3	.24*	.076	.046	.00	.47
		4	.14	.068	.341	-.07	.35
RM	1	2	-.03	.084	.997	-.29	.23
		3	-.22	.088	.193	-.49	.05
		4	-.42*	.083	.000	-.68	-.16
		5	-.60*	.083	.000	-.85	-.34
	2	1	.03	.084	.997	-.23	.29
		3	-.19	.066	.096	-.39	.02
		4	-.38*	.059	.000	-.57	-.20
		5	-.56*	.058	.000	-.74	-.38
	3	1	.22	.088	.193	-.05	.49
		2	.19	.066	.096	-.02	.39
		4	-.20	.065	.058	-.40	.00
		5	-.38*	.064	.000	-.58	-.18
	4	1	.42*	.083	.000	.16	.68

		2	.38*	.059	.000	.20	.57
		3	.20	.065	.058	.00	.40
		5	-.18*	.057	.045	-.36	.00
	5	1	.60*	.083	.000	.34	.85
		2	.56*	.058	.000	.38	.74
		3	.38*	.064	.000	.18	.58
		4	.18*	.057	.045	.00	.36
RSOS	1	2	-.37*	.100	.010	-.67	-.06
		3	-.59*	.105	.000	-.92	-.26
		4	-.48*	.099	.000	-.78	-.17
		5	-.34*	.098	.018	-.65	-.04
	2	1	.37*	.100	.010	.06	.67
		3	-.22	.078	.088	-.47	.02
		4	-.11	.070	.657	-.33	.11
		5	.02	.069	.998	-.19	.24
	3	1	.59*	.105	.000	.26	.92
		2	.22	.078	.088	-.02	.47
		4	.11	.078	.702	-.13	.35
		5	.25*	.076	.034	.01	.48
	4	1	.48*	.099	.000	.17	.78
		2	.11	.070	.657	-.11	.33
		3	-.11	.078	.702	-.35	.13
		5	.13	.068	.432	-.08	.34
	5	1	.34*	.098	.018	.04	.65
		2	-.02	.069	.998	-.24	.19
		3	-.25*	.076	.034	-.48	-.01
		4	-.13	.068	.432	-.34	.08
RS	1	2	-.07	.074	.917	-.30	.16
		3	-.01	.077	1.000	-.25	.23
		4	.16	.073	.284	-.06	.39
		5	.25*	.072	.020	.02	.47
	2	1	.07	.074	.917	-.16	.30
		3	.06	.058	.873	-.11	.24
		4	.24*	.052	.000	.08	.40
		5	.32*	.051	.000	.16	.48
	3	1	.01	.077	1.000	-.23	.25
		2	-.06	.058	.873	-.24	.11
		4	.17	.057	.062	.00	.35
		5	.26*	.056	.000	.08	.43
	4	1	-.16	.073	.284	-.39	.06

		2	-.24*	.052	.000	-.40	-.08
		3	-.17	.057	.062	-.35	.00
		5	.08	.050	.588	-.07	.24
	5	1	-.25*	.072	.020	-.47	-.02
		2	-.32*	.051	.000	-.48	-.16
		3	-.26*	.056	.000	-.43	-.08
		4	-.08	.050	.588	-.24	.07
ROFM	1	2	.00	.101	1.000	-.31	.31
		3	.12	.106	.855	-.21	.45
		4	.07	.100	.980	-.24	.37
		5	.04	.099	.995	-.26	.35
	2	1	.00	.101	1.000	-.31	.31
		3	.12	.079	.675	-.12	.37
		4	.06	.071	.938	-.16	.28
		5	.04	.070	.984	-.17	.26
	3	1	-.12	.106	.855	-.45	.21
		2	-.12	.079	.675	-.37	.12
		4	-.06	.078	.970	-.30	.18
		5	-.08	.077	.905	-.32	.16
	4	1	-.07	.100	.980	-.37	.24
		2	-.06	.071	.938	-.28	.16
		3	.06	.078	.970	-.18	.30
		5	-.02	.069	.999	-.23	.19
	5	1	-.04	.099	.995	-.35	.26
		2	-.04	.070	.984	-.26	.17
		3	.08	.077	.905	-.16	.32
		4	.02	.069	.999	-.19	.23
RO	1	2	.24*	.065	.008	.04	.45
		3	.32*	.069	.000	.11	.54
		4	.23*	.065	.015	.03	.43
		5	.26*	.064	.003	.06	.46
	2	1	-.24*	.065	.008	-.45	-.04
		3	.08	.051	.670	-.08	.24
		4	-.02	.046	.999	-.16	.13
		5	.01	.045	.999	-.13	.15
	3	1	-.32*	.069	.000	-.54	-.11
		2	-.08	.051	.670	-.24	.08
		4	-.09	.051	.489	-.25	.06
		5	-.06	.050	.791	-.22	.09
	4	1	-.23*	.065	.015	-.43	-.03

		2	.02	.046	.999	-.13	.16
		3	.09	.051	.489	-.06	.25
		5	.03	.044	.981	-.11	.17
	5	1	-.26*	.064	.003	-.46	-.06
		2	-.01	.045	.999	-.15	.13
		3	.06	.050	.791	-.09	.22
		4	-.03	.044	.981	-.17	.11
RDDOH	1	2	-.19	.073	.157	-.41	.04
		3	-.09	.077	.839	-.33	.15
		4	-.08	.072	.868	-.31	.14
		5	-.01	.072	1.000	-.23	.21
	2	1	.19	.073	.157	-.04	.41
		3	.10	.057	.584	-.08	.27
		4	.11	.051	.363	-.05	.27
		5	.18*	.050	.017	.02	.33
	3	1	.09	.077	.839	-.15	.33
		2	-.10	.057	.584	-.27	.08
		4	.01	.057	1.000	-.16	.19
		5	.08	.056	.731	-.09	.25
	4	1	.08	.072	.868	-.14	.31
		2	-.11	.051	.363	-.27	.05
		3	-.01	.057	1.000	-.19	.16
		5	.07	.050	.749	-.08	.22
	5	1	.01	.072	1.000	-.21	.23
		2	-.18*	.050	.017	-.33	-.02
		3	-.08	.056	.731	-.25	.09
		4	-.07	.050	.749	-.22	.08
REMSA	1	2	-.24	.082	.072	-.50	.01
		3	-.17	.087	.421	-.44	.10
		4	-.16	.082	.463	-.41	.10
		5	-.15	.081	.486	-.40	.10
	2	1	.24	.082	.072	-.01	.50
		3	.07	.065	.873	-.13	.27
		4	.09	.058	.686	-.09	.27
		5	.09	.057	.622	-.08	.27
	3	1	.17	.087	.421	-.10	.44
		2	-.07	.065	.873	-.27	.13
		4	.02	.064	1.000	-.18	.21
		5	.02	.063	.999	-.17	.21
	4	1	.16	.082	.463	-.10	.41

		2	-.09	.058	.686	-.27	.09
		3	-.02	.064	1.000	-.21	.18
		5	.00	.056	1.000	-.17	.18
	5	1	.15	.081	.486	-.10	.40
		2	-.09	.057	.622	-.27	.08
		3	-.02	.063	.999	-.21	.17
		4	.00	.056	1.000	-.18	.17
RCVW	1	2	-.10	.072	.738	-.32	.12
		3	-.03	.075	.998	-.26	.21
		4	-.02	.071	1.000	-.24	.20
		5	-.03	.071	.997	-.25	.19
	2	1	.10	.072	.738	-.12	.32
		3	.07	.056	.795	-.10	.25
		4	.08	.050	.606	-.07	.24
		5	.07	.049	.705	-.08	.23
	3	1	.03	.075	.998	-.21	.26
		2	-.07	.056	.795	-.25	.10
		4	.01	.056	1.000	-.16	.18
		5	.00	.055	1.000	-.17	.17
	4	1	.02	.071	1.000	-.20	.24
		2	-.08	.050	.606	-.24	.07
		3	-.01	.056	1.000	-.18	.16
		5	-.01	.049	1.000	-.16	.14
	5	1	.03	.071	.997	-.19	.25
		2	-.07	.049	.705	-.23	.08
		3	.00	.055	1.000	-.17	.17
		4	.01	.049	1.000	-.14	.16

Based on observed means.

The error term is Mean Square (Error) = .119.

*. The mean difference is significant at the .05 level.

Appendix I

Between–Group Comparisons of GG on SH

Scheffé							
			Mean			95% Confidence Interval	
Dependent Variable	(I) GG	(J) GG	Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
BUS	1	2	-1.13	.638	.539	-3.10	.85
		3	-1.82	.671	.121	-3.90	.26
		4	-1.00	.634	.645	-2.96	.96
		5	-1.24	.628	.419	-3.18	.70
	2	1	1.13	.638	.539	-.85	3.10
		3	-.69	.500	.750	-2.24	.86
		4	.12	.449	.999	-1.26	1.51
		5	-.12	.440	.999	-1.48	1.25
	3	1	1.82	.671	.121	-.26	3.90
		2	.69	.500	.750	-.86	2.24
		4	.82	.495	.605	-.71	2.35
		5	.58	.487	.843	-.93	2.09
	4	1	1.00	.634	.645	-.96	2.96
		2	-.12	.449	.999	-1.51	1.26
		3	-.82	.495	.605	-2.35	.71
		5	-.24	.434	.989	-1.58	1.10
	5	1	1.24	.628	.419	-.70	3.18
		2	.12	.440	.999	-1.25	1.48
		3	-.58	.487	.843	-2.09	.93
		4	.24	.434	.989	-1.10	1.58
EMS	1	2	-1.58	.581	.121	-3.38	.22
		3	-2.21*	.612	.012	-4.10	-.32
		4	-2.51*	.578	.001	-4.30	-.72
		5	-2.80*	.572	.000	-4.57	-1.03
	2	1	1.58	.581	.121	-.22	3.38
		3	-.63	.456	.748	-2.05	.78
		4	-.93	.409	.271	-2.20	.33
		5	-1.22	.401	.057	-2.46	.02
	3	1	2.21*	.612	.012	.32	4.10
		2	.63	.456	.748	-.78	2.05
		4	-.30	.451	.980	-1.69	1.10
		5	-.59	.444	.784	-1.96	.79

	4	1	2.51*	.578	.001	.72	4.30
		2	.93	.409	.271	-.33	2.20
		3	.30	.451	.980	-1.10	1.69
		5	-.29	.396	.970	-1.51	.94
	5	1	2.80*	.572	.000	1.03	4.57
		2	1.22	.401	.057	-.02	2.46
		3	.59	.444	.784	-.79	1.96
		4	.29	.396	.970	-.94	1.51
RMS	1	2	-1.64	.660	.190	-3.68	.40
		3	-3.67*	.694	.000	-5.82	-1.52
		4	-4.10*	.655	.000	-6.13	-2.07
		5	-4.24*	.649	.000	-6.25	-2.23
	2	1	1.64	.660	.190	-.40	3.68
		3	-2.03*	.518	.004	-3.64	-.43
		4	-2.47*	.464	.000	-3.90	-1.03
		5	-2.60*	.455	.000	-4.01	-1.19
	3	1	3.67*	.694	.000	1.52	5.82
		2	2.03*	.518	.004	.43	3.64
		4	-.43	.512	.950	-2.02	1.15
		5	-.57	.504	.868	-2.13	.99
	4	1	4.10*	.655	.000	2.07	6.13
		2	2.47*	.464	.000	1.03	3.90
		3	.43	.512	.950	-1.15	2.02
		5	-.13	.449	.999	-1.52	1.26
	5	1	4.24*	.649	.000	2.23	6.25
		2	2.60*	.455	.000	1.19	4.01
		3	.57	.504	.868	-.99	2.13
		4	.13	.449	.999	-1.26	1.52
EVS	1	2	-2.11*	.498	.001	-3.65	-.57
		3	-2.03*	.524	.005	-3.65	-.41
		4	-2.37*	.495	.000	-3.90	-.84
		5	-2.88*	.490	.000	-4.40	-1.36
	2	1	2.11*	.498	.001	.57	3.65
		3	.08	.391	1.000	-1.13	1.29
		4	-.26	.350	.967	-1.35	.82
		5	-.77	.344	.286	-1.83	.29
	3	1	2.03*	.524	.005	.41	3.65
		2	-.08	.391	1.000	-1.29	1.13
		4	-.34	.386	.939	-1.54	.85
		5	-.85	.380	.289	-2.03	.33

	4	1	2.37*	.495	.000	.84	3.90
		2	.26	.350	.967	-.82	1.35
		3	.34	.386	.939	-.85	1.54
		5	-.51	.339	.692	-1.56	.54
	5	1	2.88*	.490	.000	1.36	4.40
		2	.77	.344	.286	-.29	1.83
		3	.85	.380	.289	-.33	2.03
		4	.51	.339	.692	-.54	1.56
CUS	1	2	-.89	.385	.250	-2.09	.30
		3	-1.56*	.405	.006	-2.81	-.30
		4	-1.43*	.382	.008	-2.61	-.25
		5	-1.88*	.379	.000	-3.06	-.71
	2	1	.89	.385	.250	-.30	2.09
		3	-.66	.302	.309	-1.60	.27
		4	-.54	.271	.416	-1.37	.30
		5	-.99*	.266	.008	-1.81	-.17
	3	1	1.56*	.405	.006	.30	2.81
		2	.66	.302	.309	-.27	1.60
		4	.13	.299	.996	-.80	1.05
		5	-.33	.294	.872	-1.24	.58
	4	1	1.43*	.382	.008	.25	2.61
		2	.54	.271	.416	-.30	1.37
		3	-.13	.299	.996	-1.05	.80
		5	-.45	.262	.562	-1.26	.36
	5	1	1.88*	.379	.000	.71	3.06
		2	.99*	.266	.008	.17	1.81
		3	.33	.294	.872	-.58	1.24
		4	.45	.262	.562	-.36	1.26

Based on observed means.

The error term is Mean Square (Error) = 3.423.

*. The mean difference is significant at the .05 level.

Appendix J

Pairwise Comparisons of GG on UV with Gender Covariate

Dependent Variable: **UV**						
		Mean Difference			95% Confidence Interval for Difference[b]	
(I) GG	(J) GG	(I-J)	Std. Error	Sig.[b]	Lower Bound	Upper Bound
1	2	-.534	.396	1.000	-1.652	.585
	3	-1.046	.417	.125	-2.223	.131
	4	-2.094*	.394	.000	-3.205	-.982
	5	-2.791*	.390	.000	-3.892	-1.691
2	1	.534	.396	1.000	-.585	1.652
	3	-.512	.311	1.000	-1.390	.366
	4	-1.560*	.279	.000	-2.347	-.773
	5	-2.257*	.273	.000	-3.029	-1.485
3	1	1.046	.417	.125	-.131	2.223
	2	.512	.311	1.000	-.366	1.390
	4	-1.048*	.307	.007	-1.916	-.180
	5	-1.745*	.303	.000	-2.600	-.891
4	1	2.094*	.394	.000	.982	3.205
	2	1.560*	.279	.000	.773	2.347
	3	1.048*	.307	.007	.180	1.916
	5	-.697	.270	.101	-1.459	.064
5	1	2.791*	.390	.000	1.691	3.892
	2	2.257*	.273	.000	1.485	3.029
	3	1.745*	.303	.000	.891	2.600
	4	.697	.270	.101	-.064	1.459

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix K

Pairwise Comparisons of GG on TMPC with Gender Covariate

Dependent Variable	(I) GG	(J) GG	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
SCOB	1	2	-.209	.089	.192	-.461	.042
		3	-.293*	.094	.019	-.558	-.028
		4	-.204	.089	.217	-.454	.046
		5	-.126	.088	1.000	-.374	.121
	2	1	.209	.089	.192	-.042	.461
		3	-.084	.070	1.000	-.281	.114
		4	.005	.063	1.000	-.172	.182
		5	.083	.061	1.000	-.090	.257
	3	1	.293*	.094	.019	.028	.558
		2	.084	.070	1.000	-.114	.281
		4	.089	.069	1.000	-.106	.284
		5	.167	.068	.147	-.025	.359
	4	1	.204	.089	.217	-.046	.454
		2	-.005	.063	1.000	-.182	.172
		3	-.089	.069	1.000	-.284	.106
		5	.078	.061	1.000	-.093	.249
	5	1	.126	.088	1.000	-.121	.374
		2	-.083	.061	1.000	-.257	.090
		3	-.167	.068	.147	-.359	.025
		4	-.078	.061	1.000	-.249	.093
SD	1	2	-.184	.080	.222	-.410	.042
		3	.011	.084	1.000	-.227	.249
		4	.271*	.080	.007	.047	.496
		5	.306*	.079	.001	.084	.529
	2	1	.184	.080	.222	-.042	.410
		3	.195*	.063	.021	.017	.372
		4	.455*	.056	.000	.296	.614
		5	.490*	.055	.000	.334	.646
	3	1	-.011	.084	1.000	-.249	.227
		2	-.195*	.063	.021	-.372	-.017
		4	.260*	.062	.000	.085	.436
		5	.296*	.061	.000	.123	.468
	4	1	-.271*	.080	.007	-.496	-.047
		2	-.455*	.056	.000	-.614	-.296

		3	-.260*	.062	.000	-.436	-.085
		5	.035	.054	1.000	-.118	.189
	5	1	-.306*	.079	.001	-.529	-.084
		2	-.490*	.055	.000	-.646	-.334
		3	-.296*	.061	.000	-.468	-.123
		4	-.035	.054	1.000	-.189	.118
SFA	1	2	-.032	.069	1.000	-.227	.163
		3	-.077	.073	1.000	-.282	.129
		4	-.154	.069	.250	-.348	.039
		5	-.297*	.068	.000	-.488	-.105
	2	1	.032	.069	1.000	-.163	.227
		3	-.044	.054	1.000	-.197	.109
		4	-.122	.049	.124	-.259	.015
		5	-.265*	.048	.000	-.399	-.130
	3	1	.077	.073	1.000	-.129	.282
		2	.044	.054	1.000	-.109	.197
		4	-.078	.054	1.000	-.229	.073
		5	-.220*	.053	.000	-.369	-.071
	4	1	.154	.069	.250	-.039	.348
		2	.122	.049	.124	-.015	.259
		3	.078	.054	1.000	-.073	.229
		5	-.142*	.047	.026	-.275	-.010
	5	1	.297*	.068	.000	.105	.488
		2	.265*	.048	.000	.130	.399
		3	.220*	.053	.000	.071	.369
		4	.142*	.047	.026	.010	.275
SFR	1	2	-.230	.094	.149	-.497	.036
		3	-.293*	.099	.034	-.573	-.012
		4	-.362*	.094	.001	-.626	-.097
		5	-.458*	.093	.000	-.720	-.196
	2	1	.230	.094	.149	-.036	.497
		3	-.062	.074	1.000	-.271	.147
		4	-.131	.066	.487	-.319	.056
		5	-.228*	.065	.005	-.411	-.044
	3	1	.293*	.099	.034	.012	.573
		2	.062	.074	1.000	-.147	.271
		4	-.069	.073	1.000	-.276	.137
		5	-.166	.072	.219	-.369	.038
	4	1	.362*	.094	.001	.097	.626
		2	.131	.066	.487	-.056	.319

		3	.069	.073	1.000	-.137	.276
		5	-.097	.064	1.000	-.278	.085
	5	1	.458*	.093	.000	.196	.720
		2	.228*	.065	.005	.044	.411
		3	.166	.072	.219	-.038	.369
		4	.097	.064	1.000	-.085	.278
SM	1	2	-.046	.085	1.000	-.285	.194
		3	-.238	.089	.080	-.490	.014
		4	-.421*	.084	.000	-.659	-.183
		5	-.590*	.083	.000	-.825	-.354
	2	1	.046	.085	1.000	-.194	.285
		3	-.193*	.067	.040	-.381	-.005
		4	-.376*	.060	.000	-.544	-.207
		5	-.544*	.059	.000	-.709	-.379
	3	1	.238	.089	.080	-.014	.490
		2	.193*	.067	.040	.005	.381
		4	-.183	.066	.057	-.369	.003
		5	-.351*	.065	.000	-.534	-.168
	4	1	.421*	.084	.000	.183	.659
		2	.376*	.060	.000	.207	.544
		3	.183	.066	.057	-.003	.369
		5	-.168*	.058	.038	-.331	-.005
	5	1	.590*	.083	.000	.354	.825
		2	.544*	.059	.000	.379	.709
		3	.351*	.065	.000	.168	.534
		4	.168*	.058	.038	.005	.331
SSOS	1	2	-.411*	.099	.000	-.690	-.133
		3	-.623*	.104	.000	-.916	-.330
		4	-.478*	.098	.000	-.754	-.201
		5	-.331*	.097	.007	-.605	-.058
	2	1	.411*	.099	.000	.133	.690
		3	-.212	.077	.065	-.430	.007
		4	-.066	.069	1.000	-.262	.129
		5	.080	.068	1.000	-.112	.272
	3	1	.623*	.104	.000	.330	.916
		2	.212	.077	.065	-.007	.430
		4	.145	.076	.583	-.071	.361
		5	.291*	.075	.001	.079	.504
	4	1	.478*	.098	.000	.201	.754
		2	.066	.069	1.000	-.129	.262

		3	-.145	.076	.583	-.361	.071
		5	.146	.067	.298	-.043	.336
	5	1	.331*	.097	.007	.058	.605
		2	-.080	.068	1.000	-.272	.112
		3	-.291*	.075	.001	-.504	-.079
		4	-.146	.067	.298	-.336	.043
SS	1	2	-.107	.079	1.000	-.329	.116
		3	.006	.083	1.000	-.227	.240
		4	.172	.078	.281	-.048	.393
		5	.250*	.077	.014	.031	.468
	2	1	.107	.079	1.000	-.116	.329
		3	.113	.062	.684	-.061	.287
		4	.279*	.055	.000	.123	.435
		5	.356*	.054	.000	.203	.509
	3	1	-.006	.083	1.000	-.240	.227
		2	-.113	.062	.684	-.287	.061
		4	.166	.061	.068	-.006	.338
		5	.243*	.060	.001	.074	.413
	4	1	-.172	.078	.281	-.393	.048
		2	-.279*	.055	.000	-.435	-.123
		3	-.166	.061	.068	-.338	.006
		5	.077	.054	1.000	-.074	.228
	5	1	-.250*	.077	.014	-.468	-.031
		2	-.356*	.054	.000	-.509	-.203
		3	-.243*	.060	.001	-.413	-.074
		4	-.077	.054	1.000	-.228	.074
SOFM	1	2	-.035	.103	1.000	-.326	.256
		3	.072	.108	1.000	-.234	.378
		4	.102	.102	1.000	-.187	.391
		5	-.020	.101	1.000	-.307	.266
	2	1	.035	.103	1.000	-.256	.326
		3	.107	.081	1.000	-.121	.335
		4	.137	.072	.591	-.067	.342
		5	.014	.071	1.000	-.186	.215
	3	1	-.072	.108	1.000	-.378	.234
		2	-.107	.081	1.000	-.335	.121
		4	.030	.080	1.000	-.196	.256
		5	-.093	.079	1.000	-.315	.129
	4	1	-.102	.102	1.000	-.391	.187
		2	-.137	.072	.591	-.342	.067

		3	-.030	.080	1.000	-.256	.196
		5	-.123	.070	.807	-.321	.075
	5	1	.020	.101	1.000	-.266	.307
		2	-.014	.071	1.000	-.215	.186
		3	.093	.079	1.000	-.129	.315
		4	.123	.070	.807	-.075	.321
SO	1	2	.202	.072	.051	.000	.405
		3	.217*	.075	.043	.004	.430
		4	.254*	.071	.004	.053	.455
		5	.251*	.071	.004	.052	.450
	2	1	-.202	.072	.051	-.405	.000
		3	.015	.056	1.000	-.144	.174
		4	.052	.050	1.000	-.091	.194
		5	.049	.049	1.000	-.091	.189
	3	1	-.217*	.075	.043	-.430	-.004
		2	-.015	.056	1.000	-.174	.144
		4	.037	.056	1.000	-.120	.194
		5	.034	.055	1.000	-.120	.189
	4	1	-.254*	.071	.004	-.455	-.053
		2	-.052	.050	1.000	-.194	.091
		3	-.037	.056	1.000	-.194	.120
		5	-.003	.049	1.000	-.141	.135
	5	1	-.251*	.071	.004	-.450	-.052
		2	-.049	.049	1.000	-.189	.091
		3	-.034	.055	1.000	-.189	.120
		4	.003	.049	1.000	-.135	.141
RCOB	1	2	-.101	.085	1.000	-.341	.139
		3	-.262*	.090	.037	-.515	-.009
		4	-.142	.085	.941	-.381	.097
		5	-.066	.084	1.000	-.302	.170
	2	1	.101	.085	1.000	-.139	.341
		3	-.161	.067	.162	-.350	.027
		4	-.041	.060	1.000	-.210	.128
		5	.035	.059	1.000	-.131	.200
	3	1	.262*	.090	.037	.009	.515
		2	.161	.067	.162	-.027	.350
		4	.120	.066	.699	-.066	.306
		5	.196*	.065	.028	.012	.379
	4	1	.142	.085	.941	-.097	.381
		2	.041	.060	1.000	-.128	.210

		3	-.120	.066	.699	-.306	.066
		5	.076	.058	1.000	-.088	.239
	5	1	.066	.084	1.000	-.170	.302
		2	-.035	.059	1.000	-.200	.131
		3	-.196*	.065	.028	-.379	-.012
		4	-.076	.058	1.000	-.239	.088
RD	1	2	-.173	.079	.292	-.396	.050
		3	.042	.083	1.000	-.192	.276
		4	.271*	.078	.006	.050	.492
		5	.316*	.078	.001	.097	.535
	2	1	.173	.079	.292	-.050	.396
		3	.215*	.062	.006	.040	.390
		4	.444*	.056	.000	.287	.601
		5	.489*	.054	.000	.335	.643
	3	1	-.042	.083	1.000	-.276	.192
		2	-.215*	.062	.006	-.390	-.040
		4	.229*	.061	.002	.056	.402
		5	.274*	.060	.000	.104	.444
	4	1	-.271*	.078	.006	-.492	-.050
		2	-.444*	.056	.000	-.601	-.287
		3	-.229*	.061	.002	-.402	-.056
		5	.045	.054	1.000	-.107	.197
	5	1	-.316*	.078	.001	-.535	-.097
		2	-.489*	.054	.000	-.643	-.335
		3	-.274*	.060	.000	-.444	-.104
		4	-.045	.054	1.000	-.197	.107
RFA	1	2	-.032	.068	1.000	-.224	.160
		3	-.076	.071	1.000	-.277	.126
		4	-.143	.067	.352	-.333	.048
		5	-.286*	.067	.000	-.475	-.098
	2	1	.032	.068	1.000	-.160	.224
		3	-.044	.053	1.000	-.194	.107
		4	-.111	.048	.210	-.246	.024
		5	-.255*	.047	.000	-.387	-.122
	3	1	.076	.071	1.000	-.126	.277
		2	.044	.053	1.000	-.107	.194
		4	-.067	.053	1.000	-.216	.082
		5	-.211*	.052	.001	-.357	-.064
	4	1	.143	.067	.352	-.048	.333
		2	.111	.048	.210	-.024	.246

		3	.067	.053	1.000	-.082	.216
		5	-.144*	.046	.020	-.274	-.013
	5	1	.286*	.067	.000	.098	.475
		2	.255*	.047	.000	.122	.387
		3	.211*	.052	.001	.064	.357
		4	.144*	.046	.020	.013	.274
RFR	1	2	-.068	.098	1.000	-.346	.210
		3	-.087	.104	1.000	-.379	.206
		4	-.182	.098	.634	-.458	.094
		5	-.323*	.097	.009	-.597	-.050
	2	1	.068	.098	1.000	-.210	.346
		3	-.019	.077	1.000	-.237	.199
		4	-.114	.069	1.000	-.310	.081
		5	-.255*	.068	.002	-.447	-.064
	3	1	.087	.104	1.000	-.206	.379
		2	.019	.077	1.000	-.199	.237
		4	-.095	.076	1.000	-.311	.120
		5	-.237*	.075	.018	-.449	-.024
	4	1	.182	.098	.634	-.094	.458
		2	.114	.069	1.000	-.081	.310
		3	.095	.076	1.000	-.120	.311
		5	-.141	.067	.357	-.330	.048
	5	1	.323*	.097	.009	.050	.597
		2	.255*	.068	.002	.064	.447
		3	.237*	.075	.018	.024	.449
		4	.141	.067	.357	-.048	.330
RM	1	2	-.034	.084	1.000	-.271	.202
		3	-.222	.088	.124	-.471	.027
		4	-.420*	.083	.000	-.656	-.185
		5	-.599*	.083	.000	-.832	-.366
	2	1	.034	.084	1.000	-.202	.271
		3	-.188*	.066	.046	-.373	-.002
		4	-.386*	.059	.000	-.553	-.219
		5	-.564*	.058	.000	-.728	-.401
	3	1	.222	.088	.124	-.027	.471
		2	.188*	.066	.046	.002	.373
		4	-.199*	.065	.024	-.382	-.015
		5	-.377*	.064	.000	-.558	-.196
	4	1	.420*	.083	.000	.185	.656
		2	.386*	.059	.000	.219	.553

		3	.199*	.065	.024	.015	.382
		5	-.178*	.057	.019	-.339	-.017
	5	1	.599*	.083	.000	.366	.832
		2	.564*	.058	.000	.401	.728
		3	.377*	.064	.000	.196	.558
		4	.178*	.057	.019	.017	.339
RSOS	1	2	-.367*	.100	.003	-.649	-.085
		3	-.593*	.105	.000	-.889	-.296
		4	-.479*	.099	.000	-.759	-.198
		5	-.344*	.098	.005	-.622	-.067
	2	1	.367*	.100	.003	.085	.649
		3	-.226*	.078	.042	-.447	-.005
		4	-.112	.070	1.000	-.310	.087
		5	.022	.069	1.000	-.172	.217
	3	1	.593*	.105	.000	.296	.889
		2	.226*	.078	.042	.005	.447
		4	.114	.078	1.000	-.105	.333
		5	.248*	.076	.013	.033	.464
	4	1	.479*	.099	.000	.198	.759
		2	.112	.070	1.000	-.087	.310
		3	-.114	.078	1.000	-.333	.105
		5	.134	.068	.492	-.058	.326
	5	1	.344*	.098	.005	.067	.622
		2	-.022	.069	1.000	-.217	.172
		3	-.248*	.076	.013	-.464	-.033
		4	-.134	.068	.492	-.326	.058
RS	1	2	-.073	.073	1.000	-.280	.134
		3	-.011	.077	1.000	-.229	.207
		4	.160	.073	.283	-.045	.366
		5	.246*	.072	.007	.042	.450
	2	1	.073	.073	1.000	-.134	.280
		3	.062	.058	1.000	-.100	.225
		4	.233*	.052	.000	.088	.379
		5	.319*	.051	.000	.176	.462
	3	1	.011	.077	1.000	-.207	.229
		2	-.062	.058	1.000	-.225	.100
		4	.171*	.057	.028	.011	.332
		5	.257*	.056	.000	.098	.415
	4	1	-.160	.073	.283	-.366	.045
		2	-.233*	.052	.000	-.379	-.088

		3	-.171*	.057	.028	-.332	-.011
		5	.085	.050	.877	-.055	.226
	5	1	-.246*	.072	.007	-.450	-.042
		2	-.319*	.051	.000	-.462	-.176
		3	-.257*	.056	.000	-.415	-.098
		4	-.085	.050	.877	-.226	.055
ROFM	1	2	.001	.101	1.000	-.283	.286
		3	.121	.106	1.000	-.179	.421
		4	.063	.100	1.000	-.219	.346
		5	.043	.099	1.000	-.237	.323
	2	1	-.001	.101	1.000	-.286	.283
		3	.120	.079	1.000	-.103	.343
		4	.062	.071	1.000	-.138	.263
		5	.042	.070	1.000	-.154	.239
	3	1	-.121	.106	1.000	-.421	.179
		2	-.120	.079	1.000	-.343	.103
		4	-.058	.078	1.000	-.278	.163
		5	-.078	.077	1.000	-.295	.140
	4	1	-.063	.100	1.000	-.346	.219
		2	-.062	.071	1.000	-.263	.138
		3	.058	.078	1.000	-.163	.278
		5	-.020	.069	1.000	-.214	.173
	5	1	-.043	.099	1.000	-.323	.237
		2	-.042	.070	1.000	-.239	.154
		3	.078	.077	1.000	-.140	.295
		4	.020	.069	1.000	-.173	.214
RO	1	2	.246*	.065	.002	.062	.430
		3	.325*	.069	.000	.131	.519
		4	.232*	.065	.004	.049	.415
		5	.260*	.064	.001	.079	.441
	2	1	-.246*	.065	.002	-.430	-.062
		3	.080	.051	1.000	-.065	.224
		4	-.014	.046	1.000	-.143	.116
		5	.014	.045	1.000	-.113	.141
	3	1	-.325*	.069	.000	-.519	-.131
		2	-.080	.051	1.000	-.224	.065
		4	-.093	.051	.657	-.236	.049
		5	-.065	.050	1.000	-.206	.075
	4	1	-.232*	.065	.004	-.415	-.049
		2	.014	.046	1.000	-.116	.143

		3	.093	.051	.657	-.049	.236
		5	.028	.044	1.000	-.097	.153
	5	1	-.260*	.064	.001	-.441	-.079
		2	-.014	.045	1.000	-.141	.113
		3	.065	.050	1.000	-.075	.206
		4	-.028	.044	1.000	-.153	.097
RDDOH	1	2	-.191	.072	.085	-.394	.013
		3	-.097	.076	1.000	-.311	.117
		4	-.088	.072	1.000	-.290	.114
		5	-.017	.071	1.000	-.217	.183
	2	1	.191	.072	.085	-.013	.394
		3	.093	.057	.993	-.066	.253
		4	.103	.051	.436	-.041	.246
		5	.174*	.050	.005	.033	.314
	3	1	.097	.076	1.000	-.117	.311
		2	-.093	.057	.993	-.253	.066
		4	.009	.056	1.000	-.149	.167
		5	.080	.055	1.000	-.075	.236
	4	1	.088	.072	1.000	-.114	.290
		2	-.103	.051	.436	-.246	.041
		3	-.009	.056	1.000	-.167	.149
		5	.071	.049	1.000	-.067	.210
	5	1	.017	.071	1.000	-.183	.217
		2	-.174*	.050	.005	-.314	-.033
		3	-.080	.055	1.000	-.236	.075
		4	-.071	.049	1.000	-.210	.067
REMSA	1	2	-.243*	.082	.034	-.475	-.010
		3	-.172	.087	.479	-.417	.073
		4	-.157	.082	.563	-.388	.074
		5	-.151	.081	.626	-.380	.077
	2	1	.243*	.082	.034	.010	.475
		3	.071	.065	1.000	-.111	.253
		4	.086	.058	1.000	-.077	.250
		5	.092	.057	1.000	-.069	.252
	3	1	.172	.087	.479	-.073	.417
		2	-.071	.065	1.000	-.253	.111
		4	.015	.064	1.000	-.165	.196
		5	.021	.063	1.000	-.157	.198
	4	1	.157	.082	.563	-.074	.388
		2	-.086	.058	1.000	-.250	.077

		3	-.015	.064	1.000	-.196	.165
		5	.005	.056	1.000	-.153	.164
	5	1	.151	.081	.626	-.077	.380
		2	-.092	.057	1.000	-.252	.069
		3	-.021	.063	1.000	-.198	.157
		4	-.005	.056	1.000	-.164	.153
RCVW	1	2	-.102	.072	1.000	-.304	.100
		3	-.030	.075	1.000	-.243	.183
		4	-.020	.071	1.000	-.221	.181
		5	-.030	.071	1.000	-.229	.169
	2	1	.102	.072	1.000	-.100	.304
		3	.072	.056	1.000	-.087	.230
		4	.082	.050	1.000	-.061	.224
		5	.072	.049	1.000	-.068	.212
	3	1	.030	.075	1.000	-.183	.243
		2	-.072	.056	1.000	-.230	.087
		4	.010	.056	1.000	-.147	.167
		5	.000	.055	1.000	-.154	.155
	4	1	.020	.071	1.000	-.181	.221
		2	-.082	.050	1.000	-.224	.061
		3	-.010	.056	1.000	-.167	.147
		5	-.010	.049	1.000	-.147	.128
	5	1	.030	.071	1.000	-.169	.229
		2	-.072	.049	1.000	-.212	.068
		3	.000	.055	1.000	-.155	.154
		4	.010	.049	1.000	-.128	.147

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix L

Pairwise Comparisons of GG on SH with Gender covariate

Dependent Variable	(I) GG	(J) GG	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
BUS	1	2	-1.149	.629	.686	-2.925	.628
		3	-1.871*	.662	.050	-3.741	-.002
		4	-1.065	.625	.894	-2.830	.700
		5	-1.283	.619	.389	-3.031	.465
	2	1	1.149	.629	.686	-.628	2.925
		3	-.723	.494	1.000	-2.116	.671
		4	.084	.443	1.000	-1.166	1.334
		5	-.134	.434	1.000	-1.360	1.092
	3	1	1.871*	.662	.050	.002	3.741
		2	.723	.494	1.000	-.671	2.116
		4	.807	.488	.992	-.572	2.185
		5	.588	.481	1.000	-.769	1.945
	4	1	1.065	.625	.894	-.700	2.830
		2	-.084	.443	1.000	-1.334	1.166
		3	-.807	.488	.992	-2.185	.572
		5	-.218	.428	1.000	-1.427	.991
	5	1	1.283	.619	.389	-.465	3.031
		2	.134	.434	1.000	-1.092	1.360
		3	-.588	.481	1.000	-1.945	.769
		4	.218	.428	1.000	-.991	1.427
EMS	1	2	-1.600	.571	.053	-3.211	.012
		3	-2.264*	.601	.002	-3.961	-.568
		4	-2.572*	.567	.000	-4.174	-.971
		5	-2.839*	.562	.000	-4.425	-1.253
	2	1	1.600	.571	.053	-.012	3.211
		3	-.664	.448	1.000	-1.929	.600
		4	-.973	.402	.159	-2.107	.162
		5	-1.239*	.394	.018	-2.352	-.127
	3	1	2.264*	.601	.002	.568	3.961
		2	.664	.448	1.000	-.600	1.929
		4	-.308	.443	1.000	-1.559	.943
		5	-.575	.436	1.000	-1.806	.657
	4	1	2.572*	.567	.000	.971	4.174
		2	.973	.402	.159	-.162	2.107

		3	.308	.443	1.000	-.943	1.559
		5	-.267	.389	1.000	-1.364	.831
	5	1	2.839*	.562	.000	1.253	4.425
		2	1.239*	.394	.018	.127	2.352
		3	.575	.436	1.000	-.657	1.806
		4	.267	.389	1.000	-.831	1.364
RMS	1	2	-1.664	.648	.106	-3.493	.165
		3	-3.731*	.682	.000	-5.656	-1.806
		4	-4.176*	.644	.000	-5.994	-2.359
		5	-4.285*	.637	.000	-6.085	-2.485
	2	1	1.664	.648	.106	-.165	3.493
		3	-2.067*	.508	.001	-3.502	-.632
		4	-2.512*	.456	.000	-3.799	-1.225
		5	-2.621*	.447	.000	-3.884	-1.359
	3	1	3.731*	.682	.000	1.806	5.656
		2	2.067*	.508	.001	.632	3.502
		4	-.445	.503	1.000	-1.864	.974
		5	-.554	.495	1.000	-1.951	.843
	4	1	4.176*	.644	.000	2.359	5.994
		2	2.512*	.456	.000	1.225	3.799
		3	.445	.503	1.000	-.974	1.864
		5	-.109	.441	1.000	-1.354	1.136
	5	1	4.285*	.637	.000	2.485	6.085
		2	2.621*	.447	.000	1.359	3.884
		3	.554	.495	1.000	-.843	1.951
		4	.109	.441	1.000	-1.136	1.354
EVS	1	2	-2.117*	.497	.000	-3.522	-.712
		3	-2.045*	.524	.001	-3.523	-.567
		4	-2.392*	.494	.000	-3.788	-.996
		5	-2.893*	.490	.000	-4.275	-1.511
	2	1	2.117*	.497	.000	.712	3.522
		3	.072	.390	1.000	-1.030	1.174
		4	-.275	.350	1.000	-1.263	.714
		5	-.776	.343	.244	-1.746	.194
	3	1	2.045*	.524	.001	.567	3.523
		2	-.072	.390	1.000	-1.174	1.030
		4	-.347	.386	1.000	-1.437	.743
		5	-.848	.380	.262	-1.921	.225
	4	1	2.392*	.494	.000	.996	3.788
		2	.275	.350	1.000	-.714	1.263

		3	.347	.386	1.000	-.743	1.437
		5	-.501	.339	1.000	-1.457	.455
	5	1	2.893*	.490	.000	1.511	4.275
		2	.776	.343	.244	-.194	1.746
		3	.848	.380	.262	-.225	1.921
		4	.501	.339	1.000	-.455	1.457
CUS	1	2	-.890	.385	.212	-1.976	.196
		3	-1.547*	.405	.002	-2.690	-.404
		4	-1.420*	.382	.002	-2.499	-.340
		5	-1.876*	.379	.000	-2.945	-.807
	2	1	.890	.385	.212	-.196	1.976
		3	-.657	.302	.302	-1.509	.196
		4	-.530	.271	.512	-1.294	.235
		5	-.985*	.266	.002	-1.735	-.236
	3	1	1.547*	.405	.002	.404	2.690
		2	.657	.302	.302	-.196	1.509
		4	.127	.299	1.000	-.716	.970
		5	-.329	.294	1.000	-1.159	.501
	4	1	1.420*	.382	.002	.340	2.499
		2	.530	.271	.512	-.235	1.294
		3	-.127	.299	1.000	-.970	.716
		5	-.456	.262	.825	-1.195	.283
	5	1	1.876*	.379	.000	.807	2.945
		2	.985*	.266	.002	.236	1.735
		3	.329	.294	1.000	-.501	1.159
		4	.456	.262	.825	-.283	1.195

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix M

Pairwise Comparisons of GG on UV with Employment Status covariate

Dependent Variable: **UV**						
					95% Confidence Interval for Difference[b]	
(I) GG	(J) GG	Mean Difference (I-J)	Std. Error	Sig.[b]	Lower Bound	Upper Bound
1	2	-.564	.402	1.000	-1.698	.570
	3	-1.077	.423	.113	-2.273	.118
	4	-2.129*	.403	.000	-3.266	-.993
	5	-2.806*	.392	.000	-3.912	-1.700
2	1	.564	.402	1.000	-.570	1.698
	3	-.513	.311	.995	-1.391	.364
	4	-1.566*	.279	.000	-2.354	-.777
	5	-2.242*	.275	.000	-3.018	-1.466
3	1	1.077	.423	.113	-.118	2.273
	2	.513	.311	.995	-.364	1.391
	4	-1.052*	.308	.007	-1.921	-.184
	5	-1.728*	.305	.000	-2.589	-.868
4	1	2.129*	.403	.000	.993	3.266
	2	1.566*	.279	.000	.777	2.354
	3	1.052*	.308	.007	.184	1.921
	5	-.676	.274	.139	-1.449	.096
5	1	2.806*	.392	.000	1.700	3.912
	2	2.242*	.275	.000	1.466	3.018
	3	1.728*	.305	.000	.868	2.589
	4	.676	.274	.139	-.096	1.449

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix N

Pairwise Comparisons of GG on TMPC with Employment Status covariate

Dependent Variable	(I) GG	(J) GG	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
SCOB	1	2	-.144	.088	1.000	-.392	.104
		3	-.220	.093	.182	-.482	.042
		4	-.121	.088	1.000	-.369	.128
		5	-.090	.086	1.000	-.332	.152
	2	1	.144	.088	1.000	-.104	.392
		3	-.076	.068	1.000	-.268	.116
		4	.024	.061	1.000	-.149	.196
		5	.054	.060	1.000	-.116	.224
	3	1	.220	.093	.182	-.042	.482
		2	.076	.068	1.000	-.116	.268
		4	.099	.067	1.000	-.091	.290
		5	.130	.067	.516	-.058	.319
	4	1	.121	.088	1.000	-.128	.369
		2	-.024	.061	1.000	-.196	.149
		3	-.099	.067	1.000	-.290	.091
		5	.031	.060	1.000	-.138	.200
	5	1	.090	.086	1.000	-.152	.332
		2	-.054	.060	1.000	-.224	.116
		3	-.130	.067	.516	-.319	.058
		4	-.031	.060	1.000	-.200	.138
SD	1	2	-.181	.081	.262	-.410	.048
		3	.014	.085	1.000	-.227	.255
		4	.275*	.081	.008	.045	.504
		5	.308*	.079	.001	.085	.532
	2	1	.181	.081	.262	-.048	.410
		3	.195*	.063	.020	.018	.372
		4	.456*	.056	.000	.297	.615
		5	.489*	.056	.000	.333	.646
	3	1	-.014	.085	1.000	-.255	.227
		2	-.195*	.063	.020	-.372	-.018
		4	.261*	.062	.000	.085	.436
		5	.294*	.062	.000	.120	.468
	4	1	-.275*	.081	.008	-.504	-.045

		2	-.456*	.056	.000	-.615	-.297
		3	-.261*	.062	.000	-.436	-.085
		5	.033	.055	1.000	-.123	.189
	5	1	-.308*	.079	.001	-.532	-.085
		2	-.489*	.056	.000	-.646	-.333
		3	-.294*	.062	.000	-.468	-.120
		4	-.033	.055	1.000	-.189	.123
SFA	1	2	-.026	.070	1.000	-.223	.172
		3	-.070	.074	1.000	-.278	.139
		4	-.147	.070	.372	-.345	.051
		5	-.294*	.068	.000	-.487	-.101
	2	1	.026	.070	1.000	-.172	.223
		3	-.044	.054	1.000	-.197	.109
		4	-.121	.049	.133	-.259	.016
		5	-.268*	.048	.000	-.403	-.133
	3	1	.070	.074	1.000	-.139	.278
		2	.044	.054	1.000	-.109	.197
		4	-.077	.054	1.000	-.228	.074
		5	-.224*	.053	.000	-.374	-.074
	4	1	.147	.070	.372	-.051	.345
		2	.121	.049	.133	-.016	.259
		3	.077	.054	1.000	-.074	.228
		5	-.147*	.048	.022	-.282	-.012
	5	1	.294*	.068	.000	.101	.487
		2	.268*	.048	.000	.133	.403
		3	.224*	.053	.000	.074	.374
		4	.147*	.048	.022	.012	.282
SFR	1	2	-.217	.097	.252	-.490	.056
		3	-.274	.102	.075	-.562	.014
		4	-.340*	.097	.005	-.613	-.066
		5	-.447*	.094	.000	-.713	-.181
	2	1	.217	.097	.252	-.056	.490
		3	-.057	.075	1.000	-.268	.154
		4	-.123	.067	.686	-.313	.067
		5	-.230*	.066	.006	-.416	-.043
	3	1	.274	.102	.075	-.014	.562
		2	.057	.075	1.000	-.154	.268
		4	-.066	.074	1.000	-.275	.143
		5	-.173	.073	.189	-.380	.034
	4	1	.340*	.097	.005	.066	.613

		2	.123	.067	.686	-.067	.313
		3	.066	.074	1.000	-.143	.275
		5	-.107	.066	1.000	-.293	.079
	5	1	.447*	.094	.000	.181	.713
		2	.230*	.066	.006	.043	.416
		3	.173	.073	.189	-.034	.380
		4	.107	.066	1.000	-.079	.293
SM	1	2	-.032	.086	1.000	-.276	.212
		3	-.221	.091	.158	-.478	.036
		4	-.401*	.087	.000	-.645	-.157
		5	-.580*	.084	.000	-.817	-.342
	2	1	.032	.086	1.000	-.212	.276
		3	-.189*	.067	.050	-.378	-8.781E-5
		4	-.369*	.060	.000	-.539	-.200
		5	-.548*	.059	.000	-.715	-.381
	3	1	.221	.091	.158	-.036	.478
		2	.189*	.067	.050	8.781E-5	.378
		4	-.180	.066	.067	-.367	.006
		5	-.359*	.066	.000	-.544	-.174
	4	1	.401*	.087	.000	.157	.645
		2	.369*	.060	.000	.200	.539
		3	.180	.066	.067	-.006	.367
		5	-.179*	.059	.026	-.345	-.012
	5	1	.580*	.084	.000	.342	.817
		2	.548*	.059	.000	.381	.715
		3	.359*	.066	.000	.174	.544
		4	.179*	.059	.026	.012	.345
SSOS	1	2	-.372*	.099	.002	-.652	-.091
		3	-.576*	.105	.000	-.872	-.281
		4	-.424*	.100	.000	-.705	-.143
		5	-.307*	.097	.017	-.580	-.033
	2	1	.372*	.099	.002	.091	.652
		3	-.205	.077	.081	-.422	.012
		4	-.053	.069	1.000	-.248	.143
		5	.065	.068	1.000	-.127	.257
	3	1	.576*	.105	.000	.281	.872
		2	.205	.077	.081	-.012	.422
		4	.152	.076	.462	-.063	.367
		5	.269*	.075	.004	.056	.482
	4	1	.424*	.100	.000	.143	.705

		2	.053	.069	1.000	-.143	.248
		3	-.152	.076	.462	-.367	.063
		5	.117	.068	.842	-.074	.308
	5	1	.307*	.097	.017	.033	.580
		2	-.065	.068	1.000	-.257	.127
		3	-.269*	.075	.004	-.482	-.056
		4	-.117	.068	.842	-.308	.074
SS	1	2	-.107	.080	1.000	-.332	.119
		3	.008	.084	1.000	-.230	.246
		4	.174	.080	.305	-.052	.400
		5	.251*	.078	.014	.031	.471
	2	1	.107	.080	1.000	-.119	.332
		3	.114	.062	.659	-.061	.289
		4	.281*	.056	.000	.124	.438
		5	.358*	.055	.000	.203	.512
	3	1	-.008	.084	1.000	-.246	.230
		2	-.114	.062	.659	-.289	.061
		4	.166	.061	.069	-.006	.339
		5	.244*	.061	.001	.072	.415
	4	1	-.174	.080	.305	-.400	.052
		2	-.281*	.056	.000	-.438	-.124
		3	-.166	.061	.069	-.339	.006
		5	.077	.054	1.000	-.077	.231
	5	1	-.251*	.078	.014	-.471	-.031
		2	-.358*	.055	.000	-.512	-.203
		3	-.244*	.061	.001	-.415	-.072
		4	-.077	.054	1.000	-.231	.077
SOFM	1	2	-.064	.105	1.000	-.359	.231
		3	.042	.110	1.000	-.269	.353
		4	.068	.105	1.000	-.228	.364
		5	-.034	.102	1.000	-.322	.254
	2	1	.064	.105	1.000	-.231	.359
		3	.106	.081	1.000	-.123	.335
		4	.132	.073	.702	-.073	.338
		5	.030	.072	1.000	-.172	.232
	3	1	-.042	.110	1.000	-.353	.269
		2	-.106	.081	1.000	-.335	.123
		4	.026	.080	1.000	-.200	.252
		5	-.076	.079	1.000	-.300	.148
	4	1	-.068	.105	1.000	-.364	.228

		2	-.132	.073	.702	-.338	.073
		3	-.026	.080	1.000	-.252	.200
		5	-.102	.071	1.000	-.304	.099
	5	1	.034	.102	1.000	-.254	.322
		2	-.030	.072	1.000	-.232	.172
		3	.076	.079	1.000	-.148	.300
		4	.102	.071	1.000	-.099	.304
SO	1	2	.183	.073	.122	-.022	.388
		3	.194	.077	.118	-.022	.410
		4	.228*	.073	.019	.022	.433
		5	.239*	.071	.008	.039	.439
	2	1	-.183	.073	.122	-.388	.022
		3	.011	.056	1.000	-.148	.170
		4	.044	.051	1.000	-.098	.187
		5	.056	.050	1.000	-.085	.196
	3	1	-.194	.077	.118	-.410	.022
		2	-.011	.056	1.000	-.170	.148
		4	.034	.056	1.000	-.124	.191
		5	.045	.055	1.000	-.111	.201
	4	1	-.228*	.073	.019	-.433	-.022
		2	-.044	.051	1.000	-.187	.098
		3	-.034	.056	1.000	-.191	.124
		5	.011	.050	1.000	-.129	.151
	5	1	-.239*	.071	.008	-.439	-.039
		2	-.056	.050	1.000	-.196	.085
		3	-.045	.055	1.000	-.201	.111
		4	-.011	.050	1.000	-.151	.129
RCOB	1	2	-.048	.085	1.000	-.287	.191
		3	-.203	.089	.237	-.454	.049
		4	-.074	.085	1.000	-.314	.165
		5	-.036	.083	1.000	-.269	.197
	2	1	.048	.085	1.000	-.191	.287
		3	-.155	.066	.188	-.340	.030
		4	-.026	.059	1.000	-.192	.140
		5	.012	.058	1.000	-.152	.175
	3	1	.203	.089	.237	-.049	.454
		2	.155	.066	.188	-.030	.340
		4	.128	.065	.481	-.054	.311
		5	.166	.064	.099	-.015	.348
	4	1	.074	.085	1.000	-.165	.314

		2	.026	.059	1.000	-.140	.192
		3	-.128	.065	.481	-.311	.054
		5	.038	.058	1.000	-.125	.201
	5	1	.036	.083	1.000	-.197	.269
		2	-.012	.058	1.000	-.175	.152
		3	-.166	.064	.099	-.348	.015
		4	-.038	.058	1.000	-.201	.125
RD	1	2	-.171	.080	.330	-.397	.055
		3	.044	.084	1.000	-.194	.282
		4	.273*	.080	.007	.047	.500
		5	.317*	.078	.001	.097	.537
	2	1	.171	.080	.330	-.055	.397
		3	.215*	.062	.006	.040	.390
		4	.445*	.056	.000	.287	.602
		5	.488*	.055	.000	.334	.643
	3	1	-.044	.084	1.000	-.282	.194
		2	-.215*	.062	.006	-.390	-.040
		4	.229*	.061	.002	.056	.402
		5	.273*	.061	.000	.102	.445
	4	1	-.273*	.080	.007	-.500	-.047
		2	-.445*	.056	.000	-.602	-.287
		3	-.229*	.061	.002	-.402	-.056
		5	.044	.055	1.000	-.110	.198
	5	1	-.317*	.078	.001	-.537	-.097
		2	-.488*	.055	.000	-.643	-.334
		3	-.273*	.061	.000	-.445	-.102
		4	-.044	.055	1.000	-.198	.110
RFA	1	2	-.012	.069	1.000	-.206	.182
		3	-.054	.072	1.000	-.259	.151
		4	-.118	.069	.867	-.313	.076
		5	-.276*	.067	.000	-.466	-.087
	2	1	.012	.069	1.000	-.182	.206
		3	-.042	.053	1.000	-.193	.108
		4	-.107	.048	.265	-.242	.028
		5	-.264*	.047	.000	-.397	-.132
	3	1	.054	.072	1.000	-.151	.259
		2	.042	.053	1.000	-.108	.193
		4	-.064	.053	1.000	-.213	.084
		5	-.222*	.052	.000	-.369	-.075
	4	1	.118	.069	.867	-.076	.313

		2	.107	.048	.265	-.028	.242
		3	.064	.053	1.000	-.084	.213
		5	-.158*	.047	.008	-.290	-.026
	5	1	.276*	.067	.000	.087	.466
		2	.264*	.047	.000	.132	.397
		3	.222*	.052	.000	.075	.369
		4	.158*	.047	.008	.026	.290
RFR	1	2	-.059	.101	1.000	-.344	.226
		3	-.073	.107	1.000	-.374	.228
		4	-.166	.101	1.000	-.452	.120
		5	-.314*	.099	.015	-.592	-.036
	2	1	.059	.101	1.000	-.226	.344
		3	-.014	.078	1.000	-.235	.207
		4	-.107	.070	1.000	-.305	.092
		5	-.255*	.069	.003	-.450	-.060
	3	1	.073	.107	1.000	-.228	.374
		2	.014	.078	1.000	-.207	.235
		4	-.093	.077	1.000	-.311	.126
		5	-.241*	.077	.018	-.458	-.025
	4	1	.166	.101	1.000	-.120	.452
		2	.107	.070	1.000	-.092	.305
		3	.093	.077	1.000	-.126	.311
		5	-.148	.069	.317	-.343	.046
	5	1	.314*	.099	.015	.036	.592
		2	.255*	.069	.003	.060	.450
		3	.241*	.077	.018	.025	.458
		4	.148	.069	.317	-.046	.343
RM	1	2	-.017	.085	1.000	-.257	.223
		3	-.201	.090	.260	-.454	.053
		4	-.396*	.085	.000	-.637	-.155
		5	-.587*	.083	.000	-.821	-.352
	2	1	.017	.085	1.000	-.223	.257
		3	-.184	.066	.056	-.370	.002
		4	-.379*	.059	.000	-.546	-.212
		5	-.570*	.058	.000	-.735	-.405
	3	1	.201	.090	.260	-.053	.454
		2	.184	.066	.056	-.002	.370
		4	-.195*	.065	.029	-.379	-.011
		5	-.386*	.065	.000	-.569	-.204
	4	1	.396*	.085	.000	.155	.637

		2	.379*	.059	.000	.212	.546
		3	.195*	.065	.029	.011	.379
		5	-.191*	.058	.011	-.355	-.027
	5	1	.587*	.083	.000	.352	.821
		2	.570*	.058	.000	.405	.735
		3	.386*	.065	.000	.204	.569
		4	.191*	.058	.011	.027	.355
RSOS	1	2	-.329*	.101	.012	-.614	-.045
		3	-.549*	.106	.000	-.849	-.249
		4	-.428*	.101	.000	-.714	-.143
		5	-.321*	.098	.012	-.599	-.044
	2	1	.329*	.101	.012	.045	.614
		3	-.219	.078	.052	-.440	.001
		4	-.099	.070	1.000	-.297	.099
		5	.008	.069	1.000	-.187	.203
	3	1	.549*	.106	.000	.249	.849
		2	.219	.078	.052	-.001	.440
		4	.121	.077	1.000	-.098	.339
		5	.228*	.077	.031	.011	.444
	4	1	.428*	.101	.000	.143	.714
		2	.099	.070	1.000	-.099	.297
		3	-.121	.077	1.000	-.339	.098
		5	.107	.069	1.000	-.087	.301
	5	1	.321*	.098	.012	.044	.599
		2	-.008	.069	1.000	-.203	.187
		3	-.228*	.077	.031	-.444	-.011
		4	-.107	.069	1.000	-.301	.087
RS	1	2	-.077	.075	1.000	-.287	.134
		3	-.013	.079	1.000	-.235	.209
		4	.158	.075	.354	-.053	.369
		5	.246*	.073	.008	.040	.451
	2	1	.077	.075	1.000	-.134	.287
		3	.063	.058	1.000	-.100	.227
		4	.234*	.052	.000	.088	.381
		5	.322*	.051	.000	.178	.466
	3	1	.013	.079	1.000	-.209	.235
		2	-.063	.058	1.000	-.227	.100
		4	.171*	.057	.030	.010	.333
		5	.259*	.057	.000	.099	.419
	4	1	-.158	.075	.354	-.369	.053

		2	-.234*	.052	.000	-.381	-.088
		3	-.171*	.057	.030	-.333	-.010
		5	.088	.051	.857	-.056	.231
	5	1	-.246*	.073	.008	-.451	-.040
		2	-.322*	.051	.000	-.466	-.178
		3	-.259*	.057	.000	-.419	-.099
		4	-.088	.051	.857	-.231	.056
ROFM	1	2	-.017	.102	1.000	-.305	.272
		3	.102	.108	1.000	-.202	.406
		4	.041	.102	1.000	-.248	.330
		5	.034	.100	1.000	-.247	.315
	2	1	.017	.102	1.000	-.272	.305
		3	.118	.079	1.000	-.105	.341
		4	.058	.071	1.000	-.143	.258
		5	.050	.070	1.000	-.147	.248
	3	1	-.102	.108	1.000	-.406	.202
		2	-.118	.079	1.000	-.341	.105
		4	-.060	.078	1.000	-.281	.160
		5	-.068	.077	1.000	-.287	.151
	4	1	-.041	.102	1.000	-.330	.248
		2	-.058	.071	1.000	-.258	.143
		3	.060	.078	1.000	-.160	.281
		5	-.008	.070	1.000	-.204	.189
	5	1	-.034	.100	1.000	-.315	.247
		2	-.050	.070	1.000	-.248	.147
		3	.068	.077	1.000	-.151	.287
		4	.008	.070	1.000	-.189	.204
RO	1	2	.230*	.066	.005	.044	.417
		3	.307*	.070	.000	.110	.503
		4	.211*	.066	.016	.024	.397
		5	.250*	.064	.001	.068	.432
	2	1	-.230*	.066	.005	-.417	-.044
		3	.077	.051	1.000	-.068	.221
		4	-.020	.046	1.000	-.149	.110
		5	.020	.045	1.000	-.108	.148
	3	1	-.307*	.070	.000	-.503	-.110
		2	-.077	.051	1.000	-.221	.068
		4	-.096	.051	.580	-.239	.047
		5	-.057	.050	1.000	-.198	.085
	4	1	-.211*	.066	.016	-.397	-.024

		2	.020	.046	1.000	-.110	.149
		3	.096	.051	.580	-.047	.239
		5	.040	.045	1.000	-.088	.167
	5	1	-.250*	.064	.001	-.432	-.068
		2	-.020	.045	1.000	-.148	.108
		3	.057	.050	1.000	-.085	.198
		4	-.040	.045	1.000	-.167	.088
RDDOH	1	2	-.182	.074	.143	-.391	.027
		3	-.085	.078	1.000	-.305	.135
		4	-.073	.074	1.000	-.283	.136
		5	-.009	.072	1.000	-.213	.195
	2	1	.182	.074	.143	-.027	.391
		3	.097	.057	.902	-.064	.259
		4	.109	.051	.353	-.037	.254
		5	.173*	.051	.007	.030	.316
	3	1	.085	.078	1.000	-.135	.305
		2	-.097	.057	.902	-.259	.064
		4	.011	.057	1.000	-.149	.171
		5	.076	.056	1.000	-.083	.234
	4	1	.073	.074	1.000	-.136	.283
		2	-.109	.051	.353	-.254	.037
		3	-.011	.057	1.000	-.171	.149
		5	.065	.050	1.000	-.078	.207
	5	1	.009	.072	1.000	-.195	.213
		2	-.173*	.051	.007	-.316	-.030
		3	-.076	.056	1.000	-.234	.083
		4	-.065	.050	1.000	-.207	.078
REMSA	1	2	-.226	.083	.070	-.461	.009
		3	-.152	.088	.842	-.400	.096
		4	-.134	.084	1.000	-.370	.102
		5	-.141	.081	.838	-.370	.089
	2	1	.226	.083	.070	-.009	.461
		3	.074	.065	1.000	-.108	.256
		4	.092	.058	1.000	-.072	.256
		5	.085	.057	1.000	-.076	.246
	3	1	.152	.088	.842	-.096	.400
		2	-.074	.065	1.000	-.256	.108
		4	.018	.064	1.000	-.162	.199
		5	.011	.063	1.000	-.167	.190
	4	1	.134	.084	1.000	-.102	.370

		2	-.092	.058	1.000	-.256	.072
		3	-.018	.064	1.000	-.199	.162
		5	-.007	.057	1.000	-.167	.153
	5	1	.141	.081	.838	-.089	.370
		2	-.085	.057	1.000	-.246	.076
		3	-.011	.063	1.000	-.190	.167
		4	.007	.057	1.000	-.153	.167
RCVW	1	2	-.103	.073	1.000	-.308	.103
		3	-.030	.077	1.000	-.247	.187
		4	-.020	.073	1.000	-.226	.186
		5	-.029	.071	1.000	-.229	.171
	2	1	.103	.073	1.000	-.103	.308
		3	.073	.056	1.000	-.086	.232
		4	.083	.051	1.000	-.060	.226
		5	.073	.050	1.000	-.067	.214
	3	1	.030	.077	1.000	-.187	.247
		2	-.073	.056	1.000	-.232	.086
		4	.010	.056	1.000	-.147	.168
		5	.001	.055	1.000	-.155	.157
	4	1	.020	.073	1.000	-.186	.226
		2	-.083	.051	1.000	-.226	.060
		3	-.010	.056	1.000	-.168	.147
		5	-.009	.050	1.000	-.149	.131
	5	1	.029	.071	1.000	-.171	.229
		2	-.073	.050	1.000	-.214	.067
		3	-.001	.055	1.000	-.157	.155
		4	.009	.050	1.000	-.131	.149

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix O

Pairwise Comparisons of GG on SH with Employment Status covariate

Dependent Variable	(I) GG	(J) GG	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
BUS	1	2	-1.165	.647	.726	-2.993	.662
		3	-1.864	.682	.066	-3.791	.063
		4	-1.053	.649	1.000	-2.885	.780
		5	-1.264	.631	.459	-3.047	.518
	2	1	1.165	.647	.726	-.662	2.993
		3	-.699	.501	1.000	-2.114	.716
		4	.113	.450	1.000	-1.159	1.384
		5	-.099	.443	1.000	-1.350	1.152
	3	1	1.864	.682	.066	-.063	3.791
		2	.699	.501	1.000	-.716	2.114
		4	.811	.496	1.000	-.589	2.211
		5	.600	.491	1.000	-.788	1.987
	4	1	1.053	.649	1.000	-.780	2.885
		2	-.113	.450	1.000	-1.384	1.159
		3	-.811	.496	1.000	-2.211	.589
		5	-.212	.441	1.000	-1.457	1.034
	5	1	1.264	.631	.459	-.518	3.047
		2	.099	.443	1.000	-1.152	1.350
		3	-.600	.491	1.000	-1.987	.788
		4	.212	.441	1.000	-1.034	1.457
EMS	1	2	-1.542	.590	.093	-3.208	.124
		3	-2.172*	.622	.005	-3.928	-.415
		4	-2.463*	.591	.000	-4.133	-.793
		5	-2.776*	.575	.000	-4.401	-1.152
	2	1	1.542	.590	.093	-.124	3.208
		3	-.630	.457	1.000	-1.920	.660
		4	-.921	.411	.254	-2.080	.238
		5	-1.235*	.404	.024	-2.375	-.094
	3	1	2.172*	.622	.005	.415	3.928
		2	.630	.457	1.000	-.660	1.920
		4	-.291	.452	1.000	-1.567	.985
		5	-.605	.448	1.000	-1.869	.660
	4	1	2.463*	.591	.000	.793	4.133

		2	.921	.411	.254	-.238	2.080
		3	.291	.452	1.000	-.985	1.567
		5	-.314	.402	1.000	-1.449	.822
	5	1	2.776*	.575	.000	1.152	4.401
		2	1.235*	.404	.024	.094	2.375
		3	.605	.448	1.000	-.660	1.869
		4	.314	.402	1.000	-.822	1.449
RMS	1	2	-1.444	.667	.310	-3.327	.439
		3	-3.451*	.703	.000	-5.437	-1.466
		4	-3.852*	.669	.000	-5.740	-1.964
		5	-4.125*	.650	.000	-5.962	-2.289
	2	1	1.444	.667	.310	-.439	3.327
		3	-2.007*	.516	.001	-3.465	-.549
		4	-2.408*	.464	.000	-3.718	-1.097
		5	-2.681*	.456	.000	-3.970	-1.392
	3	1	3.451*	.703	.000	1.466	5.437
		2	2.007*	.516	.001	.549	3.465
		4	-.400	.511	1.000	-1.843	1.042
		5	-.674	.506	1.000	-2.103	.756
	4	1	3.852*	.669	.000	1.964	5.740
		2	2.408*	.464	.000	1.097	3.718
		3	.400	.511	1.000	-1.042	1.843
		5	-.273	.455	1.000	-1.557	1.010
	5	1	4.125*	.650	.000	2.289	5.962
		2	2.681*	.456	.000	1.392	3.970
		3	.674	.506	1.000	-.756	2.103
		4	.273	.455	1.000	-1.010	1.557
EVS	1	2	-2.071*	.505	.001	-3.497	-.645
		3	-1.985*	.533	.002	-3.488	-.481
		4	-2.322*	.506	.000	-3.752	-.892
		5	-2.858*	.493	.000	-4.249	-1.467
	2	1	2.071*	.505	.001	.645	3.497
		3	.086	.391	1.000	-1.019	1.190
		4	-.252	.351	1.000	-1.244	.741
		5	-.788	.346	.233	-1.764	.189
	3	1	1.985*	.533	.002	.481	3.488
		2	-.086	.391	1.000	-1.190	1.019
		4	-.337	.387	1.000	-1.430	.755
		5	-.873	.383	.233	-1.956	.209
	4	1	2.322*	.506	.000	.892	3.752

		2	.252	.351	1.000	-.741	1.244
		3	.337	.387	1.000	-.755	1.430
		5	-.536	.344	1.000	-1.508	.436
	5	1	2.858*	.493	.000	1.467	4.249
		2	.788	.346	.233	-.189	1.764
		3	.873	.383	.233	-.209	1.956
		4	.536	.344	1.000	-.436	1.508
CUS	1	2	-.983	.389	.120	-2.082	.117
		3	-1.656*	.411	.001	-2.816	-.497
		4	-1.546*	.390	.001	-2.648	-.443
		5	-1.934*	.380	.000	-3.007	-.862
	2	1	.983	.389	.120	-.117	2.082
		3	-.674	.302	.260	-1.525	.178
		4	-.563	.271	.383	-1.328	.202
		5	-.952*	.267	.004	-1.704	-.199
	3	1	1.656*	.411	.001	.497	2.816
		2	.674	.302	.260	-.178	1.525
		4	.111	.298	1.000	-.732	.953
		5	-.278	.296	1.000	-1.113	.557
	4	1	1.546*	.390	.001	.443	2.648
		2	.563	.271	.383	-.202	1.328
		3	-.111	.298	1.000	-.953	.732
		5	-.388	.265	1.000	-1.138	.361
	5	1	1.934*	.380	.000	.862	3.007
		2	.952*	.267	.004	.199	1.704
		3	.278	.296	1.000	-.557	1.113
		4	.388	.265	1.000	-.361	1.138

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix P

Pairwise Comparisons of GG on UV with Education level Covariate

Dependent Variable: UV						
		Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
(I) GG	(J) GG				Lower Bound	Upper Bound
1	2	-.533	.397	1.000	-1.653	.588
	3	-1.041	.417	.130	-2.218	.136
	4	-2.090*	.398	.000	-3.212	-.967
	5	-2.791*	.402	.000	-3.926	-1.656
2	1	.533	.397	1.000	-.588	1.653
	3	-.508	.311	1.000	-1.388	.371
	4	-1.557*	.281	.000	-2.350	-.764
	5	-2.258*	.284	.000	-3.059	-1.457
3	1	1.041	.417	.130	-.136	2.218
	2	.508	.311	1.000	-.371	1.388
	4	-1.049*	.312	.008	-1.929	-.169
	5	-1.750*	.317	.000	-2.643	-.856
4	1	2.090*	.398	.000	.967	3.212
	2	1.557*	.281	.000	.764	2.350
	3	1.049*	.312	.008	.169	1.929
	5	-.701	.273	.106	-1.472	.070
5	1	2.791*	.402	.000	1.656	3.926
	2	2.258*	.284	.000	1.457	3.059
	3	1.750*	.317	.000	.856	2.643
	4	.701	.273	.106	-.070	1.472

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix Q

Pairwise Comparisons of GG on TMPC with Education level Covariate

Dependent Variable	(I) GG	(J) GG	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
SCOB	1	2	-.215	.089	.162	-.467	.036
		3	-.296*	.094	.017	-.561	-.032
		4	-.219	.089	.145	-.472	.033
		5	-.151	.090	.961	-.406	.104
	2	1	.215	.089	.162	-.036	.467
		3	-.081	.070	1.000	-.278	.117
		4	-.004	.063	1.000	-.182	.174
		5	.065	.064	1.000	-.115	.245
	3	1	.296*	.094	.017	.032	.561
		2	.081	.070	1.000	-.117	.278
		4	.077	.070	1.000	-.121	.274
		5	.145	.071	.415	-.055	.346
	4	1	.219	.089	.145	-.033	.472
		2	.004	.063	1.000	-.174	.182
		3	-.077	.070	1.000	-.274	.121
		5	.069	.061	1.000	-.104	.242
	5	1	.151	.090	.961	-.104	.406
		2	-.065	.064	1.000	-.245	.115
		3	-.145	.071	.415	-.346	.055
		4	-.069	.061	1.000	-.242	.104
SD	1	2	-.184	.080	.220	-.410	.042
		3	.011	.084	1.000	-.227	.249
		4	.270*	.080	.008	.043	.497
		5	.304*	.081	.002	.075	.533
	2	1	.184	.080	.220	-.042	.410
		3	.195*	.063	.020	.018	.373
		4	.454*	.057	.000	.294	.614
		5	.488*	.057	.000	.327	.650
	3	1	-.011	.084	1.000	-.249	.227
		2	-.195*	.063	.020	-.373	-.018
		4	.259*	.063	.000	.081	.437
		5	.293*	.064	.000	.113	.474
	4	1	-.270*	.080	.008	-.497	-.043
		2	-.454*	.057	.000	-.614	-.294

		3	-.259*	.063	.000	-.437	-.081
		5	.034	.055	1.000	-.121	.190
	5	1	-.304*	.081	.002	-.533	-.075
		2	-.488*	.057	.000	-.650	-.327
		3	-.293*	.064	.000	-.474	-.113
		4	-.034	.055	1.000	-.190	.121
SFA	1	2	-.033	.069	1.000	-.228	.163
		3	-.078	.073	1.000	-.283	.127
		4	-.155	.069	.257	-.351	.041
		5	-.296*	.070	.000	-.494	-.098
	2	1	.033	.069	1.000	-.163	.228
		3	-.045	.054	1.000	-.199	.108
		4	-.123	.049	.127	-.261	.016
		5	-.264*	.049	.000	-.403	-.124
	3	1	.078	.073	1.000	-.127	.283
		2	.045	.054	1.000	-.108	.199
		4	-.077	.054	1.000	-.231	.076
		5	-.218*	.055	.001	-.374	-.062
	4	1	.155	.069	.257	-.041	.351
		2	.123	.049	.127	-.016	.261
		3	.077	.054	1.000	-.076	.231
		5	-.141*	.048	.032	-.275	-.007
	5	1	.296*	.070	.000	.098	.494
		2	.264*	.049	.000	.124	.403
		3	.218*	.055	.001	.062	.374
		4	.141*	.048	.032	.007	.275
SFR	1	2	-.234	.095	.148	-.503	.036
		3	-.287*	.100	.044	-.570	-.004
		4	-.368*	.096	.001	-.638	-.099
		5	-.479*	.097	.000	-.752	-.206
	2	1	.234	.095	.148	-.036	.503
		3	-.054	.075	1.000	-.265	.158
		4	-.135	.067	.463	-.325	.056
		5	-.246*	.068	.004	-.438	-.053
	3	1	.287*	.100	.044	.004	.570
		2	.054	.075	1.000	-.158	.265
		4	-.081	.075	1.000	-.293	.130
		5	-.192	.076	.121	-.407	.023
	4	1	.368*	.096	.001	.099	.638
		2	.135	.067	.463	-.056	.325

		3	.081	.075	1.000	-.130	.293
		5	-.111	.066	.927	-.296	.075
	5	1	.479*	.097	.000	.206	.752
		2	.246*	.068	.004	.053	.438
		3	.192	.076	.121	-.023	.407
		4	.111	.066	.927	-.075	.296
SM	1	2	-.047	.085	1.000	-.288	.194
		3	-.235	.090	.091	-.488	.018
		4	-.424*	.085	.000	-.666	-.183
		5	-.600*	.086	.000	-.844	-.356
	2	1	.047	.085	1.000	-.194	.288
		3	-.188	.067	.052	-.377	.001
		4	-.377*	.060	.000	-.548	-.207
		5	-.553*	.061	.000	-.725	-.381
	3	1	.235	.090	.091	-.018	.488
		2	.188	.067	.052	-.001	.377
		4	-.189	.067	.050	-.378	1.565E-5
		5	-.365*	.068	.000	-.557	-.173
	4	1	.424*	.085	.000	.183	.666
		2	.377*	.060	.000	.207	.548
		3	.189	.067	.050	-1.565E-5	.378
		5	-.176*	.059	.030	-.341	-.010
	5	1	.600*	.086	.000	.356	.844
		2	.553*	.061	.000	.381	.725
		3	.365*	.068	.000	.173	.557
		4	.176*	.059	.030	.010	.341
SSOS	1	2	-.415*	.099	.000	-.694	-.136
		3	-.621*	.104	.000	-.914	-.328
		4	-.487*	.099	.000	-.766	-.207
		5	-.351*	.100	.005	-.634	-.069
	2	1	.415*	.099	.000	.136	.694
		3	-.206	.077	.082	-.425	.013
		4	-.072	.070	1.000	-.269	.126
		5	.064	.071	1.000	-.135	.263
	3	1	.621*	.104	.000	.328	.914
		2	.206	.077	.082	-.013	.425
		4	.134	.078	.837	-.085	.353
		5	.270*	.079	.007	.048	.493
	4	1	.487*	.099	.000	.207	.766
		2	.072	.070	1.000	-.126	.269

		3	-.134	.078	.837	-.353	.085
		5	.136	.068	.466	-.056	.327
	5	1	.351*	.100	.005	.069	.634
		2	-.064	.071	1.000	-.263	.135
		3	-.270*	.079	.007	-.493	-.048
		4	-.136	.068	.466	-.327	.056
SS	1	2	-.100	.079	1.000	-.323	.122
		3	.010	.083	1.000	-.224	.244
		4	.188	.079	.176	-.035	.411
		5	.274*	.080	.007	.048	.499
	2	1	.100	.079	1.000	-.122	.323
		3	.111	.062	.747	-.064	.285
		4	.289*	.056	.000	.131	.446
		5	.374*	.056	.000	.215	.533
	3	1	-.010	.083	1.000	-.244	.224
		2	-.111	.062	.747	-.285	.064
		4	.178*	.062	.043	.003	.353
		5	.264*	.063	.000	.086	.441
	4	1	-.188	.079	.176	-.411	.035
		2	-.289*	.056	.000	-.446	-.131
		3	-.178*	.062	.043	-.353	-.003
		5	.086	.054	1.000	-.068	.239
	5	1	-.274*	.080	.007	-.499	-.048
		2	-.374*	.056	.000	-.533	-.215
		3	-.264*	.063	.000	-.441	-.086
		4	-.086	.054	1.000	-.239	.068
SOFM	1	2	-.029	.104	1.000	-.322	.264
		3	.078	.109	1.000	-.229	.386
		4	.118	.104	1.000	-.176	.411
		5	-.001	.105	1.000	-.297	.296
	2	1	.029	.104	1.000	-.264	.322
		3	.108	.081	1.000	-.122	.337
		4	.147	.073	.462	-.060	.354
		5	.029	.074	1.000	-.181	.238
	3	1	-.078	.109	1.000	-.386	.229
		2	-.108	.081	1.000	-.337	.122
		4	.039	.081	1.000	-.191	.269
		5	-.079	.083	1.000	-.313	.155
	4	1	-.118	.104	1.000	-.411	.176
		2	-.147	.073	.462	-.354	.060

		3	-.039	.081	1.000	-.269	.191
		5	-.118	.071	.981	-.320	.083
	5	1	.001	.105	1.000	-.296	.297
		2	-.029	.074	1.000	-.238	.181
		3	.079	.083	1.000	-.155	.313
		4	.118	.071	.981	-.083	.320
SO	1	2	.201	.072	.055	-.002	.404
		3	.214*	.076	.049	.000	.428
		4	.251*	.072	.006	.047	.455
		5	.249*	.073	.007	.043	.455
	2	1	-.201	.072	.055	-.404	.002
		3	.013	.057	1.000	-.146	.173
		4	.050	.051	1.000	-.094	.194
		5	.048	.052	1.000	-.097	.194
	3	1	-.214*	.076	.049	-.428	.000
		2	-.013	.057	1.000	-.173	.146
		4	.037	.057	1.000	-.123	.196
		5	.035	.057	1.000	-.127	.197
	4	1	-.251*	.072	.006	-.455	-.047
		2	-.050	.051	1.000	-.194	.094
		3	-.037	.057	1.000	-.196	.123
		5	-.002	.050	1.000	-.141	.138
	5	1	-.249*	.073	.007	-.455	-.043
		2	-.048	.052	1.000	-.194	.097
		3	-.035	.057	1.000	-.197	.127
		4	.002	.050	1.000	-.138	.141
RCOB	1	2	-.105	.085	1.000	-.345	.135
		3	-.264*	.089	.034	-.516	-.011
		4	-.153	.085	.743	-.393	.088
		5	-.084	.086	1.000	-.327	.160
	2	1	.105	.085	1.000	-.135	.345
		3	-.159	.067	.180	-.347	.030
		4	-.048	.060	1.000	-.218	.122
		5	.021	.061	1.000	-.151	.193
	3	1	.264*	.089	.034	.011	.516
		2	.159	.067	.180	-.030	.347
		4	.111	.067	.978	-.078	.300
		5	.180	.068	.085	-.012	.371
	4	1	.153	.085	.743	-.088	.393
		2	.048	.060	1.000	-.122	.218

		3	-.111	.067	.978	-.300	.078
		5	.069	.059	1.000	-.097	.234
	5	1	.084	.086	1.000	-.160	.327
		2	-.021	.061	1.000	-.193	.151
		3	-.180	.068	.085	-.371	.012
		4	-.069	.059	1.000	-.234	.097
RD	1	2	-.169	.079	.326	-.392	.054
		3	.043	.083	1.000	-.191	.277
		4	.280*	.079	.005	.056	.503
		5	.330*	.080	.000	.105	.556
	2	1	.169	.079	.326	-.054	.392
		3	.213*	.062	.007	.038	.387
		4	.449*	.056	.000	.291	.607
		5	.500*	.056	.000	.340	.659
	3	1	-.043	.083	1.000	-.277	.191
		2	-.213*	.062	.007	-.387	-.038
		4	.236*	.062	.002	.061	.411
		5	.287*	.063	.000	.109	.465
	4	1	-.280*	.079	.005	-.503	-.056
		2	-.449*	.056	.000	-.607	-.291
		3	-.236*	.062	.002	-.411	-.061
		5	.051	.054	1.000	-.102	.204
	5	1	-.330*	.080	.000	-.556	-.105
		2	-.500*	.056	.000	-.659	-.340
		3	-.287*	.063	.000	-.465	-.109
		4	-.051	.054	1.000	-.204	.102
RFA	1	2	-.034	.068	1.000	-.226	.159
		3	-.078	.072	1.000	-.281	.124
		4	-.148	.068	.313	-.341	.045
		5	-.292*	.069	.000	-.487	-.097
	2	1	.034	.068	1.000	-.159	.226
		3	-.045	.054	1.000	-.196	.107
		4	-.114	.048	.187	-.250	.022
		5	-.258*	.049	.000	-.396	-.120
	3	1	.078	.072	1.000	-.124	.281
		2	.045	.054	1.000	-.107	.196
		4	-.069	.054	1.000	-.221	.082
		5	-.214*	.054	.001	-.367	-.060
	4	1	.148	.068	.313	-.045	.341
		2	.114	.048	.187	-.022	.250

		3	.069	.054	1.000	-.082	.221
		5	-.144*	.047	.023	-.277	-.012
	5	1	.292*	.069	.000	.097	.487
		2	.258*	.049	.000	.120	.396
		3	.214*	.054	.001	.060	.367
		4	.144*	.047	.023	.012	.277
RFR	1	2	-.064	.100	1.000	-.346	.218
		3	-.079	.105	1.000	-.376	.217
		4	-.171	.100	.887	-.453	.112
		5	-.313*	.101	.021	-.598	-.027
	2	1	.064	.100	1.000	-.218	.346
		3	-.016	.078	1.000	-.237	.206
		4	-.107	.071	1.000	-.306	.093
		5	-.249*	.071	.005	-.451	-.048
	3	1	.079	.105	1.000	-.217	.376
		2	.016	.078	1.000	-.206	.237
		4	-.091	.078	1.000	-.313	.130
		5	-.234*	.080	.036	-.458	-.009
	4	1	.171	.100	.887	-.112	.453
		2	.107	.071	1.000	-.093	.306
		3	.091	.078	1.000	-.130	.313
		5	-.142	.069	.390	-.336	.052
	5	1	.313*	.101	.021	.027	.598
		2	.249*	.071	.005	.048	.451
		3	.234*	.080	.036	.009	.458
		4	.142	.069	.390	-.052	.336
RM	1	2	-.034	.084	1.000	-.272	.204
		3	-.219	.089	.138	-.469	.031
		4	-.420*	.084	.000	-.659	-.182
		5	-.602*	.085	.000	-.843	-.361
	2	1	.034	.084	1.000	-.204	.272
		3	-.185	.066	.055	-.371	.002
		4	-.386*	.060	.000	-.554	-.217
		5	-.568*	.060	.000	-.738	-.398
	3	1	.219	.089	.138	-.031	.469
		2	.185	.066	.055	-.002	.371
		4	-.201*	.066	.025	-.388	-.014
		5	-.383*	.067	.000	-.573	-.194
	4	1	.420*	.084	.000	.182	.659
		2	.386*	.060	.000	.217	.554

		3	.201*	.066	.025	.014	.388
		5	-.182*	.058	.018	-.346	-.019
	5	1	.602*	.085	.000	.361	.843
		2	.568*	.060	.000	.398	.738
		3	.383*	.067	.000	.194	.573
		4	.182*	.058	.018	.019	.346
RSOS	1	2	-.370*	.100	.003	-.653	-.087
		3	-.591*	.105	.000	-.888	-.294
		4	-.486*	.100	.000	-.769	-.203
		5	-.361*	.101	.004	-.648	-.075
	2	1	.370*	.100	.003	.087	.653
		3	-.221	.079	.052	-.443	.001
		4	-.116	.071	1.000	-.316	.084
		5	.009	.072	1.000	-.194	.211
	3	1	.591*	.105	.000	.294	.888
		2	.221	.079	.052	-.001	.443
		4	.105	.079	1.000	-.117	.327
		5	.230*	.080	.043	.004	.455
	4	1	.486*	.100	.000	.203	.769
		2	.116	.071	1.000	-.084	.316
		3	-.105	.079	1.000	-.327	.117
		5	.125	.069	.708	-.070	.319
	5	1	.361*	.101	.004	.075	.648
		2	-.009	.072	1.000	-.211	.194
		3	-.230*	.080	.043	-.455	-.004
		4	-.125	.069	.708	-.319	.070
RS	1	2	-.065	.074	1.000	-.273	.142
		3	-.006	.077	1.000	-.224	.212
		4	.180	.074	.149	-.028	.388
		5	.276*	.075	.002	.066	.487
	2	1	.065	.074	1.000	-.142	.273
		3	.059	.058	1.000	-.104	.222
		4	.246*	.052	.000	.099	.392
		5	.342*	.053	.000	.193	.490
	3	1	.006	.077	1.000	-.212	.224
		2	-.059	.058	1.000	-.222	.104
		4	.186*	.058	.014	.023	.349
		5	.282*	.059	.000	.117	.448
	4	1	-.180	.074	.149	-.388	.028
		2	-.246*	.052	.000	-.392	-.099

		3	-.186*	.058	.014	-.349	-.023
		5	.096	.051	.583	-.047	.239
	5	1	-.276*	.075	.002	-.487	-.066
		2	-.342*	.053	.000	-.490	-.193
		3	-.282*	.059	.000	-.448	-.117
		4	-.096	.051	.583	-.239	.047
ROFM	1	2	.002	.101	1.000	-.283	.287
		3	.123	.106	1.000	-.177	.422
		4	.066	.101	1.000	-.220	.352
		5	.046	.102	1.000	-.243	.335
	2	1	-.002	.101	1.000	-.287	.283
		3	.120	.079	1.000	-.103	.344
		4	.064	.071	1.000	-.138	.266
		5	.044	.072	1.000	-.160	.248
	3	1	-.123	.106	1.000	-.422	.177
		2	-.120	.079	1.000	-.344	.103
		4	-.056	.079	1.000	-.280	.168
		5	-.076	.081	1.000	-.304	.151
	4	1	-.066	.101	1.000	-.352	.220
		2	-.064	.071	1.000	-.266	.138
		3	.056	.079	1.000	-.168	.280
		5	-.020	.069	1.000	-.216	.176
	5	1	-.046	.102	1.000	-.335	.243
		2	-.044	.072	1.000	-.248	.160
		3	.076	.081	1.000	-.151	.304
		4	.020	.069	1.000	-.176	.216
RO	1	2	.245*	.065	.002	.060	.429
		3	.324*	.069	.000	.130	.518
		4	.229*	.066	.005	.044	.415
		5	.258*	.066	.001	.071	.445
	2	1	-.245*	.065	.002	-.429	-.060
		3	.079	.051	1.000	-.066	.224
		4	-.015	.046	1.000	-.146	.115
		5	.013	.047	1.000	-.119	.145
	3	1	-.324*	.069	.000	-.518	-.130
		2	-.079	.051	1.000	-.224	.066
		4	-.094	.051	.678	-.239	.051
		5	-.065	.052	1.000	-.213	.082
	4	1	-.229*	.066	.005	-.415	-.044
		2	.015	.046	1.000	-.115	.146

		3	.094	.051	.678	-.051	.239
		5	.029	.045	1.000	-.098	.156
	5	1	-.258*	.066	.001	-.445	-.071
		2	-.013	.047	1.000	-.145	.119
		3	.065	.052	1.000	-.082	.213
		4	-.029	.045	1.000	-.156	.098
RDDOH	1	2	-.189	.073	.101	-.395	.017
		3	-.092	.077	1.000	-.309	.125
		4	-.083	.073	1.000	-.290	.124
		5	-.016	.074	1.000	-.225	.193
	2	1	.189	.073	.101	-.017	.395
		3	.097	.057	.914	-.065	.259
		4	.106	.052	.416	-.040	.252
		5	.173*	.052	.010	.026	.321
	3	1	.092	.077	1.000	-.125	.309
		2	-.097	.057	.914	-.259	.065
		4	.009	.057	1.000	-.153	.171
		5	.076	.058	1.000	-.088	.241
	4	1	.083	.073	1.000	-.124	.290
		2	-.106	.052	.416	-.252	.040
		3	-.009	.057	1.000	-.171	.153
		5	.068	.050	1.000	-.074	.209
	5	1	.016	.074	1.000	-.193	.225
		2	-.173*	.052	.010	-.321	-.026
		3	-.076	.058	1.000	-.241	.088
		4	-.068	.050	1.000	-.209	.074
REMSA	1	2	-.245*	.082	.031	-.478	-.012
		3	-.172	.087	.484	-.416	.073
		4	-.162	.083	.505	-.395	.071
		5	-.162	.084	.526	-.398	.073
	2	1	.245*	.082	.031	.012	.478
		3	.074	.065	1.000	-.109	.256
		4	.083	.058	1.000	-.082	.248
		5	.083	.059	1.000	-.084	.249
	3	1	.172	.087	.484	-.073	.416
		2	-.074	.065	1.000	-.256	.109
		4	.009	.065	1.000	-.173	.192
		5	.009	.066	1.000	-.177	.195
	4	1	.162	.083	.505	-.071	.395
		2	-.083	.058	1.000	-.248	.082

		3	-.009	.065	1.000	-.192	.173
		5	.000	.057	1.000	-.160	.160
	5	1	.162	.084	.526	-.073	.398
		2	-.083	.059	1.000	-.249	.084
		3	-.009	.066	1.000	-.195	.177
		4	.000	.057	1.000	-.160	.160
RCVW	1	2	-.100	.072	1.000	-.303	.103
		3	-.028	.076	1.000	-.241	.185
		4	-.015	.072	1.000	-.219	.188
		5	-.024	.073	1.000	-.229	.182
	2	1	.100	.072	1.000	-.103	.303
		3	.072	.056	1.000	-.087	.231
		4	.085	.051	.963	-.059	.228
		5	.076	.051	1.000	-.069	.221
	3	1	.028	.076	1.000	-.185	.241
		2	-.072	.056	1.000	-.231	.087
		4	.013	.056	1.000	-.147	.172
		5	.004	.057	1.000	-.158	.166
	4	1	.015	.072	1.000	-.188	.219
		2	-.085	.051	.963	-.228	.059
		3	-.013	.056	1.000	-.172	.147
		5	-.008	.049	1.000	-.148	.131
	5	1	.024	.073	1.000	-.182	.229
		2	-.076	.051	1.000	-.221	.069
		3	-.004	.057	1.000	-.166	.158
		4	.008	.049	1.000	-.131	.148

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix R

Pairwise Comparisons of GG on SH with Education level Covariate

Dependent Variable	(I) GG	(J) GG	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
BUS	1	2	-1.116	.640	.817	-2.923	.690
		3	-1.818	.672	.071	-3.715	.080
		4	-.977	.641	1.000	-2.786	.832
		5	-1.198	.648	.653	-3.027	.632
	2	1	1.116	.640	.817	-.690	2.923
		3	-.701	.502	1.000	-2.118	.716
		4	.139	.453	1.000	-1.138	1.417
		5	-.081	.457	1.000	-1.373	1.210
	3	1	1.818	.672	.071	-.080	3.715
		2	.701	.502	1.000	-.716	2.118
		4	.840	.502	.950	-.578	2.259
		5	.620	.510	1.000	-.821	2.060
	4	1	.977	.641	1.000	-.832	2.786
		2	-.139	.453	1.000	-1.417	1.138
		3	-.840	.502	.950	-2.259	.578
		5	-.221	.440	1.000	-1.463	1.021
	5	1	1.198	.648	.653	-.632	3.027
		2	.081	.457	1.000	-1.210	1.373
		3	-.620	.510	1.000	-2.060	.821
		4	.221	.440	1.000	-1.021	1.463
EMS	1	2	-1.581	.583	.070	-3.228	.065
		3	-2.212*	.613	.003	-3.942	-.482
		4	-2.519*	.584	.000	-4.168	-.870
		5	-2.816*	.591	.000	-4.483	-1.148
	2	1	1.581	.583	.070	-.065	3.228
		3	-.631	.457	1.000	-1.923	.660
		4	-.938	.413	.236	-2.103	.227
		5	-1.235*	.417	.033	-2.412	-.057
	3	1	2.212*	.613	.003	.482	3.942
		2	.631	.457	1.000	-.660	1.923
		4	-.307	.458	1.000	-1.599	.986
		5	-.603	.465	1.000	-1.916	.710
	4	1	2.519*	.584	.000	.870	4.168
		2	.938	.413	.236	-.227	2.103

		3	.307	.458	1.000	-.986	1.599
		5	-.297	.401	1.000	-1.429	.836
	5	1	2.816*	.591	.000	1.148	4.483
		2	1.235*	.417	.033	.057	2.412
		3	.603	.465	1.000	-.710	1.916
		4	.297	.401	1.000	-.836	1.429
RMS	1	2	-1.561	.658	.182	-3.419	.297
		3	-3.652*	.691	.000	-5.604	-1.700
		4	-3.909*	.659	.000	-5.770	-2.048
		5	-3.898*	.667	.000	-5.780	-2.016
	2	1	1.561	.658	.182	-.297	3.419
		3	-2.091*	.516	.001	-3.548	-.634
		4	-2.348*	.466	.000	-3.663	-1.034
		5	-2.337*	.470	.000	-3.665	-1.009
	3	1	3.652*	.691	.000	1.700	5.604
		2	2.091*	.516	.001	.634	3.548
		4	-.257	.517	1.000	-1.716	1.201
		5	-.246	.525	1.000	-1.728	1.236
	4	1	3.909*	.659	.000	2.048	5.770
		2	2.348*	.466	.000	1.034	3.663
		3	.257	.517	1.000	-1.201	1.716
		5	.011	.453	1.000	-1.266	1.289
	5	1	3.898*	.667	.000	2.016	5.780
		2	2.337*	.470	.000	1.009	3.665
		3	.246	.525	1.000	-1.236	1.728
		4	-.011	.453	1.000	-1.289	1.266
EVS	1	2	-2.140*	.499	.000	-3.547	-.732
		3	-2.037*	.524	.001	-3.516	-.558
		4	-2.447*	.499	.000	-3.857	-1.037
		5	-3.009*	.505	.000	-4.435	-1.584
	2	1	2.140*	.499	.000	.732	3.547
		3	.102	.391	1.000	-1.002	1.207
		4	-.307	.353	1.000	-1.303	.688
		5	-.870	.356	.152	-1.876	.137
	3	1	2.037*	.524	.001	.558	3.516
		2	-.102	.391	1.000	-1.207	1.002
		4	-.410	.391	1.000	-1.515	.695
		5	-.972	.398	.150	-2.095	.151
	4	1	2.447*	.499	.000	1.037	3.857
		2	.307	.353	1.000	-.688	1.303

		3	.410	.391	1.000	-.695	1.515
		5	-.562	.343	1.000	-1.530	.406
	5	1	3.009*	.505	.000	1.584	4.435
		2	.870	.356	.152	-.137	1.876
		3	.972	.398	.150	-.151	2.095
		4	.562	.343	1.000	-.406	1.530
CUS	1	2	-.880	.386	.230	-1.969	.209
		3	-1.553*	.405	.001	-2.697	-.409
		4	-1.395*	.386	.003	-2.486	-.305
		5	-1.820*	.391	.000	-2.923	-.717
	2	1	.880	.386	.230	-.209	1.969
		3	-.673	.302	.267	-1.527	.181
		4	-.515	.273	.597	-1.286	.255
		5	-.940*	.276	.007	-1.719	-.162
	3	1	1.553*	.405	.001	.409	2.697
		2	.673	.302	.267	-.181	1.527
		4	.158	.303	1.000	-.697	1.012
		5	-.267	.308	1.000	-1.136	.601
	4	1	1.395*	.386	.003	.305	2.486
		2	.515	.273	.597	-.255	1.286
		3	-.158	.303	1.000	-1.012	.697
		5	-.425	.265	1.000	-1.174	.324
	5	1	1.820*	.391	.000	.717	2.923
		2	.940*	.276	.007	.162	1.719
		3	.267	.308	1.000	-.601	1.136
		4	.425	.265	1.000	-.324	1.174

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix S

Summary of Common Semi-Structured Interview Questions and Consensus

P=Post War Silent Generation, B=Baby Boomers, X=Generation X, M=Millennials, Z=Generation Z

Question 1: Do you text more than you talk?

P: Talking preference outweighs texting by a huge margin
B: Talking outweighs texting, but by a very small margin
X: Texting outweighs talking, but only by a small margin
M: Texting is more common and more preferred for several reasons
Z: Texting preference outweighs talking by a huge margin

Question 2: Has your texting frequency changed any in the last 3-5 years?

P: Yes, has increased over the past few years, started using
B: Yes, much more, a lot due to it is children's primary media
X: Yes, primarily due to children family, friends, and work
M: Yes, for the most part, because everyone is using it now
Z: No – Staying the same or have reduced text usage

Question 3: Are there any issues that make texting difficult for you?

P: Yes – physical size of smart phones make keyboard hard to use
B: Not a problem for most, but some say keyboard too small
X: Half expressed some physical issue
M: No issues with keyboard or physical issues.
Z: A cross section of issues, but mostly not physical issues

Question 4: Should there be any limits to when and where you can and cannot text?

P: Yes – driving, walking, restaurants, public places
B: Yes – driving, walking, restaurants
X: Yes – driving
M: Yes – driving
Z: Yes - need limits, but no consensus as to what limits should be

Question 5: What do you foresee happening with texting in the next 5 years?

P: Better text-to-speech and speech-to-text
B: Increased usage, more restrictions, better text-to-speech and speech-to-text
X: Continued increasing usage, better tools (holograms, emoji's)
M: Increased usage, better speech to text, Wi-Fi Internet apps
Z: Yes - need limits, but no consensus as to what limits should be

P=Post War Silent Generation, B=Baby Boomers, X=Generation X, M=Millennials, Z=Generation Z

Question 6: What is your principle use/purpose for texting?

P: Scheduling, doctor/dentist/vet appointments, brief communications
B: Quick communications, scheduling, send photos
X: Communication with family & friends, spouse or significant other, work
M: Communication with family & friends, spouse or significant other
Z: Quick communications, clarity, scheduling

Question 7: Is there anything else you would like to add regarding texting?

P: People should do it less, talk more, and look up from phone more often
B: Useful but annoying, good way to communicate, should do it less, and talk more
X: It is a great resource, causing some physical pain, should use complete sentences
M: Stop staring at phones, prefer talking over the phone, texting will soon be obsolete
Z: Good for shy people, but out of hand, hate using, emotions don't translate

References

AAA Foundation (2014). 2013 Traffic Safety Culture Index. Retrieved from https://www.aaafoundation.org/sites/default/files/TSCI 2013 Final FTS Format.pdf

Adler, M., & Ziglio, E. (1996). *Gazing into the oracle: the Delphi method and its application to social policy and public health*. Jessica Kingsley Publishers.

Ahn, D., & Shin, D. (2013). Is the social use of media for seeking connectedness or for avoiding social isolation? Mechanisms underlying media use and subjective well-being. *Computers in Human Behavior*, *29*(6), 2453–2462. https://doi.org/10.1016/j.chb.2012.12.022

Anderson, M. (2015). 6 facts about Americans and their smartphones. Retrieved December 1, 2015, from http://www.pewresearch.org/fact-tank/2015/04/01/6-facts-about-americans-and-their-smartphones/

Auter, P. (2007). Portable social groups: willingness to communicate, interpersonal communication gratifications, and cell phone use among young adults. *International Journal of Mobile Communications*, *5*(2), 139-156. https://doi.org/10.1504/IJMC.2007.011813

Ball-Rokeach, S. (1985). The origins of individual media-system dependency: a sociological framework. *Communication Research*, *12*, 485–510. https://doi.org/10.1177/009365085012004003

Barker, C., Pistrang, N., & Elliott, R. (2002). *Research methods in clinical psychology: An introduction for students and practitioners, 2nd Ed*. Chichester, England: John Wiley and Sons.

Barlow, A. (2008). Adult Texting in Context: Exploring Norms for Mature Users of Text messaging Technologies: A thesis presented to (Doctoral dissertation, East Tennessee State University).

Baron, N. & Campbell, E. (2010). Talking takes too long: Gender and cultural patterns in mobile telephony. In *Conference of Association of Internet Researchers, Göteborg, Sweden.* Retrieved from https://www.american.edu/cas/lfs/faculty-docs/upload/Talking-Takes-Too-Long.pdf

Bartels, L. & Jackman, S. (2014). A generational model of political learning. *Electoral Studies*, *33*, 7–18. https://doi.org/10.1016/j.electstud.2013.06.004

Becker, H. (2009). It's the economy…. *Lab on a Chip*, *9*(19), 2759. https://doi.org/10.1039/b916505n

Bhutta, C. (2012). Not by the Book: Facebook as a Sampling Frame. *Sociological Methods & Research*, *41*(1), 57–88. https://doi.org/10.1177/0049124112440795

Bian, M., & Leung, L. (2015). Linking loneliness, shyness, smartphone addiction symptoms, and patterns of smartphone use to social capital. *Social Science Computer Review*, *33*(1), 61–79. https://doi.org/10.1177/0894439314528779

Bianchi, A. & Phillips, J. (2005) Psychological predictors of problem phone use, *Cyberpsychology and Behavior*, *8*(1), 39-51. https://doi.org/10.1089/cpb.2005.8.39

Billieux, J. (2012). Problematic Use of the Mobile Phone: A Literature Review and a Pathways Model. *Current Psychiatry Reviews*, *8*(4), 299–307. https://doi.org/10.2174/157340012803520522

Blau, P. (1964). *Exchange and power in social life*. Transaction Publishers.

Boot, W., Charness, N., Czaja, S., Sharit, J., Rogers, W., & Fisk, A. (2015). Computer proficiency questionnaires: Assessing low and high computer proficient seniors. *The Gerontologist*, *55*(3), 404-411. https://doi.org/10.1093/geront/gnt117

Boyd, D. (2014). *It's Complicated* - The social lives of networked teens. Retrieved from http://www.danah.org/books/ItsComplicated.pdf

Brooks, A. & Churchill, E. (2010). Knowing Me, Knowing You: A Case Study of Social Networking Sites and Participant Recruitment, *In ACM Conference on Computer Supported Cooperative Work* (pp. 6-10*).* Savannah, GA.

Brosch, A. (2008). Text messaging and its Effect on Youth's Relationships. *The New Educational Review*, *14*, 91-101

Butt, S., & Phillips, J. (2008). Personality and self-reported mobile phone use. *Computers in Human Behavior*, *24*(2), 346–360. https://doi.org/10.1016/j.chb.2007.01.019

Caelli, K., Ray, L., & Mill, J. (2003). Clear as mud: Toward greater clarity in generic qualitative research. *International Journal of Qualitative Methods*, *2*(2), 1-24.

Campbell, S., & Kelley, M. (2006). Mobile phone use in AA networks: An exploratory study. *Journal of Applied Communication Research*, *34*(2), 191-208. https://doi.org/10.1177/0270467610380009

Carrier, L., Cheever, N., Rosen, L., Benitez, S., & Chang, J. (2009). Multitasking across generations: multitasking choices and difficulty ratings in three generations of Americans. *Computers in Human Behavior*, *25*(2), 483-489. https://doi.org/10.1016/j.chb.2008.10.012

Carver, L., Beamish, R., & Phillips, S. (2018). Successful Aging: Illness and Social Connections. *Geriatrics*, *3*(1), 3. https://doi.org/10.3390/geriatrics3010003

Caughlin, J, Basinger, E., & Sharabi, L. (2016). The Connections between Communication Technologies and Relational Conflict. *Communicating Interpersonal Conflict in Close Relationships: Contexts, Challenges, and Opportunities* (2016).

Chan, M. (2015). Mobile phones and the good life: Examining the relationships among mobile use, social capital and subjective well-being. *New Media & Society*, *17*(1), 96–113. https://doi.org/10.1177/1461444813516836

Chen, Q., & Yan, Z. (2016). Does multitasking with mobile phones affect learning? A review. *Computers in Human Behavior*, *54*, 34–42. https://doi.org/10.1016/j.chb.2015.07.047

Čičević, S., Samčović, A., & Nešić, M. (2016). Exploring college students' generational differences in Facebook usage. *Computers in Human Behavior*, *56*, 83–92. https://doi.org/10.1016/j.chb.2015.11.034

Cohen-Sheffer, M. (2014 Text Message Response Times and What They Really Mean. https://www.viber.com/blog/2017-11-06/text-message-response-times/

Collins, R., Kashdan, T., & Gollnisch, G. (2003). The feasibility of using cellular phones to collect ecological momentary assessment data: Application to alcohol consumption. *Experimental and Clinical Psychopharmacology*, *11*(1), 73–78. http://dx.doi.org/10.1037/1064-1297.11.1.73

Cooper, D., & Schindler, P. (2006). *Business research methods (9th Ed.)* New York: McGraw-Hill.

Copeland-Welp, J. (2013). *Login to Your Life: Managing Relationships on Demand.* BookBaby.

Creswell, J. (2013). *Qualitative inquiry and research design: Choosing among five approaches.* Sage publications.

Cronbach, L. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297-334. https://doi.org/10.1007/BF02310555

Damasceno, G., Ferreira, A., Nogueira, L., Reis, F.., Andrade, I., & Meziat-Filho, N. (2018). Text neck and neck pain in 18–21-year-old young adults. *European Spine Journal*, (January), 1–6. https://doi.org/10.1007/s00586-017-5444-5

DeFleur, M., & Ball-Rokeach, S. (1982). *Theories of mass communication* (4th Ed.). New York: Longman

Deng, Z., Lu, Y., Wei, K. K., & Zhang, J. (2010). Understanding customer satisfaction and loyalty: An empirical study of mobile instant messages in China. *International Journal of Information Management*, *30*(4), 289–300. https://doi.org/10.1016/j.ijinfomgt.2009.10.001

Dennis, A., Fuller, R., & Valacich, J. (2008). Media, tasks, and communication processes: a theory of media synchronicity. *MIS Quarterly*, *32*(3), 575-600.

DeSanctis, G. & Poole, M. (1994) Capturing the complexity in advanced technology use: Adaptive structuration theory. *Organization Science, 5* (2) (1994), pp. 121-148

Dickinger, A., Haghirian, P., Murphy, J., & Scharl, A. (2004). An investigation and conceptual model of SMS marketing. *37th Annual Hawaii International Conference on System Sciences, 2004. Proceedings of the, HICSS*-37(C), 1–10. https://doi.org/10.1109/HICSS.2004.1265096

Dimmick, J., Patterson, S., & Sikand, J. (1996). Personal telephone networks: A typology and two empirical studies. *Journal of Broadcasting & Electronic Media*, *40*(1), 45-59.

Dimmick, J., Ramirez, A, Wang, T., & Lin, S. (2007). `Extending Society': the role of personal networks and gratification-utilities in the use of interactive communication media. *New Media & Society*, *9*(5), 795–810. http://doi.org/10.1177/1461444807081225

Donath, J. (1999). Identity and Deception in the Virtual Community. *Communities in Cyberspace*, 27–58. https://doi.org/10.1519/JSC.0b013e3181e4f7a9

Drouin, M., & Landgraff, C. (2012). Texting, sexting, and attachment in college students' romantic relationships. *Computers in Human Behavior, 28*(2), 444-449.

Duggan, M. (2014). Mobile Technology Fact Sheet. Pew Internet: Washington, D.C. http://www.pewinternet.org/fact-sheets/mobile-technology-fact-sheet/

Eagan, K., Stolzenberg E., Ramirez J., Aragon M., Suchard, M., & Rios-Aguilar C. (2016). The American Freshman: Fifty-Year Trends 1966–2015, *Higher Education Research Institute*, Retrieved from https://www.heri.ucla.edu/monographs/50YearTrendsMonograph2016.pdf

Ehrenberg, A., Juckes, S., White, K., & Walsh, S. (2008). Personality and self-esteem as predictors of young people's technology use. *Cyberpsychology & Behavior: The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, *11*(6), 739–741. https://doi.org/10.1089/cpb.2008.0030

Ericsson, K. (1996). *The road to excellence: The acquisition of expert performance in the arts and sciences, sports, and games*: Psychology Press.

Experian (2013), 8-24-Year-Old Smartphone Owners Send and Receive Almost 4K Texts per Month at http://www.experian.com/marketing-services/2013-digital-marketer-report.html?WT.srch=PR_EMS_DMReport_020813_DMReport

Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey: A systematic review. *Computers in Human Behavior, 26*(2), 132-139.

Flanagin, A. (2005). IM Online: Instant Messaging Use among College Students. *Communication Research Reports*, *22*(3), 175–187. https://doi.org/10.1080/00036810500206966

Forgays, D., Hyman, I., & Schreiber, J. (2014). Texting everywhere for everything: Gender and age differences in cell phone etiquette and use. *Computers in Human Behavior*, *31*(1), 314–321. https://doi.org/10.1016/j.chb.2013.10.053

Frederick, C., Hoppock, A., Liskey, D., & Brown, D. (2014). The Impact of Technology on Adolescent Identity Development. *International Journal of Liberal Arts and Social Science*, *2*(7), 1–12.

Fuller, C., Simmering, M., Atinc, G., Atinc, Y., & Babin, B. (2016). Common methods variance detection in business research. *Journal of Business Research*, *69*(8), 3192–3198. https://doi.org/10.1016/j.jbusres.2015.12.008

Gell, N., Rosenberg, D., Demiris, G., LaCroix, A., & Patel K (2015). Patterns of technology use among older adults with and without disabilities. *The Gerontologist*, *55*(3), 412-421. https://doi.org/10.1093/geront/gnt166

Glaeser, E., Laibson, D., & Sacerdote, B. (2002). An Economic Approach to Social Capital. *The Economic Journal*, *112*(November), F437–F458. https://doi.org/10.2307/798456

Golden, L. (2015). Irregular work scheduling and its consequences. *SSRN Electronic Journal, (Briefing Paper #394),* 1–41. https://doi.org/10.2139/ssrn.2597172

Goldman, K., Gross, P., Heeren, C., Herman, G., Kaczmarczyk, L., Loui, M., & Zilles, C. (2008). Identifying important and difficult concepts in introductory computing courses using a Delphi process. *ACM SIGCSE Bulletin, 40*(1), 256-260. https://doi.org/10.1145/1352322.1352226, 40(1), 256-260.

Gould, J., & Lewis, C. (1983). Designing for usability---key principles and what designers think. *Communications of the ACM, 28*(3), 300-311. https://doi.org/10.1145/800045.801579

Grellhesl, M., & Punyanunt-Carter, N. (2012). Using the uses and gratifications theory to understand gratifications sought through text messaging practices of male and female undergraduate students. *Computers in Human Behavior*, *28*(6), 2175–2181. https://doi.org/10.1016/j.chb.2012.06.024

Guo, R, Dobson, T. & Petrina, S. (2008). Digital natives, digital immigrants: an analysis of age and ICT competency in teacher education. *Journal of Educational Computing Research, 38*(3), 235–254.

Hall, J. & Baym, N. (2012). Calling and texting (too much): Mobile maintenance expectations, (over)dependence, entrapment, and friendship satisfaction. *New Media & Society, 14*(2), 316–331. https://doi.org/10.1177/1461444811415047

Harrison, M. & Gilmore, A. (2012). U txt WHEN? College students' social contexts of text messaging. *The Social Science Journal, 49*,513–518.

Harwood, J., Dooley, J., Scott, A., & Joiner, R. (2014). Constantly connected - The effects of smart-devices on mental health. *Computers in Human Behavior, 34,* 267–272. https://doi.org/10.1016/j.chb.2014.02.006

Henson, R. (2001). Understanding internal consistency reliability estimates: A conceptual primer on coefficient alpha. *Measurement and evaluation in counseling and development*, 34(3), 177.

Hodges University (2016). *Institutional Effectiveness & Research,* Retrieved from http://www.hodges.edu/about/ie.aspx

Holtzman, S., DeClerck, D., Turcotte, K., Lisi, D., & Woodworth, M. (2017). Emotional support during times of stress: Can text messaging compete with in-person interactions? *Computers in Human Behavior, 71*, 130–139. https://doi.org/10.1016/j.chb.2017.01.043

Howden, L., & Meyer, J. (2011). Age and Sex Composition: 2010. 2010 Census Briefs. *U.S. Census Bureau*, (May), 1–15. Retrieved from http://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf

Howe, N., & Strauss, W. (2007). The Next 20 Years - How Customer and Workforce Attitudes Will Evolve. *Harvard Business Review,* 85

Igarashi, T., Motoyoshi, T., Takai, J., & Yoshida, T. (2008). No mobile, no life: Self-perception and text-message dependency among Japanese high school students. *Computers in Human Behavior, 24*(5), 2311–2324. https://doi.org/10.1016/j.chb.2007.12.001

Ito, M., & Okabe, D. (2005). Intimate Connections: Contextualizing Japanese youth and mobile messaging, in *The Kluwer International Series on Computer Supported Cooperative Work, 4*, 127-145. https://doi.org/10.1007/1-4020-3060-6_7

Josuweit, A. (2018). 5 Reasons Generation Z Will Be 'Generation Smart' About College. Retrieved from https://www.forbes.com/sites/andrewjosuweit/2018/03/21/5-reasons-generation-z-will-be-generation-smart-about-college/#7f1b48a67888

Katz, E. (1974). Utilization of Mass Communication by the Individual. *The Uses of Mass Communications: Current Perspectives on Gratifications Research*, 19-32.

Katz, J. (2008) Mainstreamed mobiles in daily life: Perspectives and prospects. *Handbook of Mobile Communication Studies*, 443–446.

Khan, M. (2008). Adverse effects of excessive mobile phone use. *International Journal of Occupational Medicine and Environmental Health*, *21*(4), 289–293. http://doi.org/10.2478/v10001-008-0028-6

Kippax, S., & Murray, J. (1980). Using the Mass Media: Need Gratification and Perceived Utility, *Communication Research, 7*(3), 335-360

Kitch, C. (2003). Generational identity and memory in American newsmagazines. *Journalism*, *4*(2), 185-202. http://doi.org/10.1177/146488490342003

Kitzing, P., Maier, A., & Ahlander, V. (2009). Automatic speech recognition (ASR) and its use as a tool for assessment or therapy of voice, speech, and language disorders. *Logopedics, Phoniatrics, Vocology*, *34*(2), 91–6. https://doi.org/10.1080/14015430802657216

Koutamanis, M., Vossen, H., Peter, J., & Valkenburg, P. (2013). Practice makes perfect: The longitudinal effect of adolescents' instant messaging on their ability to initiate offline friendships. *Computers in Human Behavior*, *29*(6), 2265–2272. https://doi.org/10.1016/j.chb.2013.04.033

Krejcie, R. & Morgan, D. (1970). Determining sample size for research activities. *Educational and psychological measurement*, *30*(3), 607-610.

Kvale, S., & Brinkmann, S. (2009). *InterView: Learning the craft of qualitative research interviewing*. Los Angeles, CA: Sage.

Lai, K., & Hong, K. (2014). Technology use and learning characteristics of students in higher education: Do generational differences exist? *British Journal of Educational Technology*, *46*(4). https://doi.org/10.1111/bjet.12161

Lakhani, K., & Von Hippel, E. (2003). How open source software works: "free" user-to-user assistance. *Research Policy*, *32*(6), 923–943. https://doi.org/10.1016/S0048-7333 (02)00095-1

Lapointe, L., Boudreau-Pinsonneault, C., & Vaghefi, I. (2013). Is smartphone usage truly smart? A qualitative investigation of IT addictive behaviors. *In System Sciences (HICSS), 2013 46th Hawaii International Conference on* (pp. 1063-1072). IEEE. https://doi.org/10.1109/HICSS.2013.367

Leahy, D., Lyons, A., Dahm, M., & Quinlan, D. (2017). To text or not to text? Implications for general practice: A mixed methods investigation. *International Journal of Integrated Care*, *17*(5).

Lee, Y., Chang, C., Lin, Y., & Cheng, Z. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in Human Behavior*, *31*(1), 373–383. https://doi.org/10.1016/j.chb.2013.10.047

Lenhart, A. (2010). Teens, cell phones and texting: Summary of findings. Pew Research Center Publications. Retrieved from http://pewinternet.org/~/media//Files/Reports/2010/PIP-Teens-and-Mobile-2010-with-topline.pdf

Lepp, A., Barkley, J. & Karpinski, A. (2014). The relationship between cell phone use, academic performance, anxiety, and satisfaction with life in college students. *Computers in Human Behavior, 31*, 343–350. https://doi.org/10.1016/j.chb.2013.10.049

Leung, L. (2001) College Student Motives for Chatting on ICQ, *New Media & Society, 3*(4), 483-500.

Leung, L. (2008). Linking Psychological Attributes to Addiction and Improper Use of the Mobile Phone among Adolescents in Hong Kong. *Journal of Children and Media*, *2*(2), 93–113. https://doi.org/ 10.1177/14614440122226209

Levy, Y. (2006). *Assessing the value of E-learning systems*. Hershey, PA: Information Science Publishers.

Lichauco, J. (2017). The Philippines: Texting Capital of the World. *TextEngine*. Available at: https://www.textengine.info/blog/the-philippines-texting-capital-of-the-world. Accessed 7/17/2018.

Lin, Nan (2001). *Social Capital: A Theory of Social Structure and Action*. Cambridge MA: Cambridge University Press.

Ling, R. & Yttri, B. (2001). Hyper-co-ordination via mobile phones in Norway. In J. Katz & M. Aakhus (Eds.), *Perpetual contact: Mobile communication, private talk and public performance*, 139-169. Cambridge: Cambridge University Press.

Ling, R. (2004). *The mobile connection: The cell phone's impact on society*. San Francisco, CA: Morgan Kaufman Publishers.

Ling, R. (2010). Texting as a life phase medium. *Journal of Computer-Mediated Communication, 15*(2), 277–292. https://doi.org/10.1111/j.1083-6101.2010.01520.x

Linstone, H. & Turoff, M. (2011). Delphi: A brief look backward and forward. *Technological Forecasting and Social Change*, *78*(9), 1712–1719. https://doi.org/10.1016/j.techfore.2010.09.011

Lohse, B. (2013). Facebook is an effective strategy to recruit low-income women to online nutrition education. *Journal of Nutrition Education and Behavior, 45*(1), 69-76.

Lowry, P., Cao, J., & Everard, A. (2011). Privacy concerns versus desire for interpersonal awareness in driving the use of self-disclosure technologies: The case of instant messaging in two cultures. *Journal of Management Information Systems, 27*(4), 163-200. https://doi.org/10.2753/MIS0742-1222270406

Lundy, B. L., & Drouin, M. (2016). From social anxiety to interpersonal connectedness: Relationship building within face-to-face, phone and instant messaging mediums. *Computers in Human Behavior*, *54*, 271–277. https://doi.org/10.1016/j.chb.2015.08.004

Madell, D., & Muncer, S. (2007). Control over social interactions: an important reason for young people's use of the Internet and mobile phones for communication? *Cyberpsychology & Behavior: The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, *10*(1), 137–140. https://doi.org/10.1089/cpb.2006.9980

Mahatanankoon, P., & O'Sullivan, P. (2008). Attitude toward mobile text messaging: An expectancy-based perspective. *Journal of Computer-Mediated Communication, 13*(4), 973–992. https://doi.org/10.1111/j.1083-6101.2008.00427.x

Mannheim, M. (1952). The problem of generations. *Essays on Sociology of Knowledge* (P. Kecskemeti, Trans.).

Martin, J., Hamilton, B., Osterman, M., Curtin, S. & Matthews, T. (2015). Births: Final data for 2013. *National Vital Statistics Reports: From the Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System, 64*(1), 1–65.

McPherson, M., Smith-Lovin, L., & Brashears, M. (2008). Social Isolation in America: Changes in Core Discussion Networks over Two Decades. *American Sociological Review*, *73*(6), 353–375. https://doi.org/10.1177/000312240807300610

Merriam, S. (1998). *Qualitative Research and Case Study Applications in Education. Revised and Expanded from "Case Study Research in Education".* Jossey-Bass Publishers, San Francisco, CA

Mertler, C., & Vannatta, R. (2010). *Advanced and multivariate statistical methods: Practical application and interpretation* (4th Ed.). Los Angeles: Pyrczak.

Nglazi, M., Bekker, L., Wood, R., Hussey, G., & Wiysonge, C. (2013). Mobile phone text messaging for promoting adherence to anti-tuberculosis treatment: a systematic review. *BMC Infectious Diseases*, *13*(1), 566. http://doi.org/10.1186/1471-2334-13-566

Nickerson, R., Isaac, H., & Mak, B. (2008). A multi-national study of attitudes about mobile phone use in social settings. *International Journal of Mobile Communications, 6*(5), 541. https://doi.org/10.1504/IJMC.2008.019321

Novak, J. (2012). The six living generations in America. *Marketing Teacher,* Retrieved from http://www.Marketingteacher.com/the-six-living-generations-in-america

O'Keeffe, G., & Clarke-Pearson, K. (2011). The impact of social media on children, adolescents, and families. *American Academy of Pediatrics, 127*(4), 800–804. https://doi.org/10.1542/peds.2011-0054

Odaci, H., & Çelik, Ç. (2013). Who are problematic internet users? An investigation of the correlations between problematic internet use and shyness, loneliness, narcissism, aggression and self-perception. *Computers in Human Behavior*, *29*(6), 2382–2387. https://doi.org/10.1016/j.chb.2013.05.026

Onwuegbuzie, A. (2007). A Typology of Mixed Methods Sampling Designs in Social Science Research, *The Qualitative Report 12*(2), 281–316.

Ortutay (2017) AP-NORC poll: Most teens have taken social media break. Available at: http://www.apnorc.org/news-media/Pages/AP-NORC-poll-Most-teens-have-taken-social-media-break.aspx / Accessed 5/1/2017.

Osborne, J. & Overbay, A. (2004). The power of outliers (and why researchers should always check for them). *Practical assessment, research & evaluation, 9(*6), 1-12. https://doi.org/10.1017/CBO9781107415324.004

Ostroff, C., Kinicki, A., & Clark, M. (2002). Substantive and operational issues of response bias across levels of analysis: An example of climate-satisfaction relationships. *Journal of Applied Psychology*, *87*, 355–368.

Palmgreen, P., Wenner, L., & Rosengren, K. (1985) Uses and Gratifications Research: The Past Ten Years, *Media Gratifications Research: Current Perspectives*, 11–37. Beverly Hills, CA: Sage.

Panek, E. (2014). Left to Their Own Devices: College Students' "Guilty Pleasure" Media Use and Time Management. *Communication Research, 41*(4), 561-577. https://doi.org/10.1177/0093650213499657

Park, J., Yang, S., & Lehto, X. (2007). Adoption of Mobile Technologies for Chinese Consumers. *Journal of Electronic Commerce Research*, *8*(3), 196–206. https://doi.org/10.1.1.92.2520

Patton, M. (2005). *Qualitative research*. John Wiley & Sons, Ltd.

Pempek, T., Yermolayeva, Y., & Calvert, S. (2009). College students' social networking experiences on Facebook. *Journal of Applied Developmental Psychology*, *30*(3), 227-238. https://doi.org/10.1016/j.appdev.2008.12.010

Perron, J., Dao, M., Righini, N., Humair, J., Broers, B., Narring, F, Haller D., & Gaspoz, J. (2013). Text messaging versus telephone reminders to reduce missed appointments in an academic primary care clinic: a randomized controlled trial. *BMC Health Services Research, 13,* 125. http://doi.org/10.1186/1472-6963-13-125

Perry, M. & Werner-Wilson, R. (2011). Couples and computer-mediated communication: A closer look at the affordances and use of the channel. *Family and Consumer Sciences Research Journal*, *40*(2), 120–134. https://doi.org/10.1111/j.1552-3934.2011.02099.x

Pettigrew, J (2009) Text messaging and connectedness within close interpersonal relationships. *Marriage & Family Review, 45* (2009), pp. 697-716

Pew Research Center (2014). *Millennials in adulthood: Detached from institutions, net-worked with friends*. Retrieved from http:// www.pewsocialtrends.org/2014/03/07/ millennials-in-adulthood/

Pew Research Center (2017) Mobile Fact Sheet. Available at: http://www.pewinternet.org/fact-sheet/mobile / Accessed 4/1/2017.

Podsakoff, P., MacKenzie, S., Lee, J., & Podsakoff, N. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(January), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Posey, C., Lowry, P., Roberts, T., & Ellis, T. (2010). Proposing the online community self-disclosure model: the case of working professionals in France and the U.K. who use online communities. *European Journal of Information Systems*, *19*(2), 181–195. https://doi.org/10.1057/ejis.2010.15

Prensky, M. (2001). Digital natives, digital immigrants, part 1. *On the horizon*, *9*(5), 1-6. MBC University Press

Putnam, R., (1993). The Prosperous Community: Social Capital and Public Life. *The American Prospect*, *13*(13), 35–42. https://doi.org/http://www.prospect.org/cs/articles?article=the_prosperous_community

Quan-Haase, A. & Young, A. (2010). Uses and Gratifications of Social Media: A Comparison of Facebook and Instant Messaging. *Bulletin of Science, Technology & Society*, *30*(5), 350–361. https://doi.org/10.1177/0270467610380009

Redish, J. (2012). Letting Go of the Words: Writing Web Content that Works (2nd ed.). Waltham, MA: Morgan Kaufmann Publishers/Elsevier.

Reid, D. & Reid, F. (2004). Insights into the social and psychological effects of SMS text messaging. Retrieved from http://www.160characters.org/documents/SocialEffectsOfTextMessaging.pdf

Reid, D. & Reid, F. (2007). Text or talk? Social anxiety, loneliness, and divergent preferences for cell phone use. *CyberPsychology and Behavior*, *10*(3), 424–435. https://doi.org/10.1089/cpb.2006.9936

Rosen, L. (2007). *Me, Myspace, and I: Parenting the net generation*. New York, NY: Palgrave Macmillan

Rosen, L. (2011). *Teaching the iGeneration. Educational Leadership*, 68(5), 10-15.

Rosenberger, R. (2013). An Argument against "No Look Texting" While Driving. *IEEE Technology and Society Magazine*, (March), 53–59.

Rowe, G., & Wright, G. (1999). The Delphi technique as a forecasting tool: issues and analysis. *International Journal of Forecasting*, *15*(4), 353–375. https://doi.org/10.1016/S0169-2070 (99)00018-7

Rubin, A. (1983). Television uses and gratifications: The interactions of viewing patterns and motivations, *Journal of Broadcasting, 27*, 37-51

Salehan, M., & Negahban, A. (2013). Social networking on smartphones: When mobile phones become addictive. *Computers in Human Behavior*, *29*(6), 2632–2639. https://doi.org/10.1016/j.chb.2013.07.003

Scheffé, H. (1953). A method for judging all contrasts in the analysis of variance. *Biometrika*, *40*(4), 87–104. https://doi.org/10.1093/biomet/40.1-2.87

Schwieger, D. & Ladwig, L. (2013) Reaching and Retaining the Next Generation: Adapting to the Expectations of Gen Z in the Classroom. *Information Systems Education Journal*, *11*(2), 45-54

Sekaran, U., & Bougie, R. (2013). *Research methods for business - A skill building approach*. Hoboken, NJ: John Wiley & Sons.

Shamoon, E (2016). Best apps to block texting while driving. Retrieved from https://www.verizonwireless.com/articles/best-apps-to-block-texting-while-driving/

Sharma, P., Yetton, P., & Crawford, J. (2009). Estimating the effect of common method variance: The method-method pair technique with an illustration from TAM research. *MIS Quarterly*, 473-490.

Shatto, B., & Erwin, K. (2016). Moving on From Millennials: Preparing for Generation Z. *Journal of Continuing Education in Nursing*, *47*(6), 253–254. https://doi.org/10.3928/00220124-20160518-05

Sherman, L., Michikyan, M., & Greenfield, P. (2013). The effects of text, audio, video, and in-person communication on bonding between friends. *Cyberpsychology*, *7*(2). https://doi.org/10.5817/CP201323

Shirazi, C. (2009). *Data-informed calibration and aggregation of expert opinion in a Bayesian framework* (Doctoral dissertation, University of Maryland, College Park).

Shneiderman, B., Plaisant, C., Cohen M., Jacobs S., Elmqvist N., & Diakopoulos N. (2017*). Designing the User Interface: Strategies for Effective Human-Computer Interaction*, 6th Edition. Pearson Education Inc., Boston

Siau, K., & Shen, Z. (2003). Mobile communications and mobile services. *International Journal of Mobile Communications*, *1*(1-2), 3-14. https://doi.org/10.1504/IJMC.2003.002457

Skierkowski, D., & Wood, R. (2012). To text or not to text? The importance of text messaging among college-aged youth. *Computers in Human Behavior*, *28*(2), 744–756. https://doi.org/10.1016/j.chb.2011.11.023

Smith, A. (2011). Americans and text messaging. *Pew Research Center*. Available at: http://www.pewinternet.org/2011/09/19/americans-and-text messaging/ Accessed 7/17/2015. https://doi.org/10.1177/0894439310396186

Smith, A. (2015). U.S. Smartphone Use in 2015. Pew Research Center. Available at: http://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/.

Smith, A., & Chaparro, B. (2015). Smartphone Text Input Method Performance, Usability, and Preference with Younger and Older Adults. Human Factors: *The Journal of the Human Factors and Ergonomics Society*, *57*(6), 1015–1028. https://doi.org/10.1177/0018720815575644

Spitzer, A. (1973). The Historical Problem of Generations. *The American Historical Review*, *78*(5), 1353–1385.

Stephens, K., Waters, E., Cruz, I., & Zhu, Y. (2017). Meetings as Persistent Conversations that use ICTs and Face-to-Face to Build Social Capital. In *Proceedings of the 50th Hawaii International Conference on System Sciences* (pp. 2175–2184).

Stepler, R. (2016). Living arrangements of older Americans by gender. Pew Research Center. Available at: http://www.pewsocialtrends.org/2016/02/18/2-living-arrangements-of-older-americans-by-gender/

Sultan, A. (2014). Addiction to mobile text messaging applications is nothing to “lol” about. *Social Science Journal*, *51*(1), 57–69. https://doi.org/10.1016/j.soscij.2013.09.003

T, A. (2012). *Finger-Friendly Design: Ideal Mobile Touchscreen Target Sizes*. Retrieved from http://www.smashingmagazine.com/2012/02/finger-friendly-design-ideal-mobile-touchscreen-target-sizes/

Takao, M., Takahashi, S., & Kitamura, M. (2009). Addictive Personality and Problematic Mobile Phone Use. *CyberPsychology & Behavior*, *12*(5), 501–507. https://doi.org/10.1089/cpb.2009.0022

Teddlie, C., & Tashakkori, A. (Eds.). (2010). *Sage handbook of mixed methods in social & behavioral research.* Sage.

Thompson, L., & Cupples, J. (2008). Seen and not heard? Text messaging and digital sociality. *Social & Cultural Geography*, *9*(1), 95–108. http://doi.org/10.1080/14649360701789634

Thompson, M (2015). 5 Ways to Integrate SMS Marketing with Social Media Campaigns. Retrieved from https://www.socialmediatoday.com/marketing/2015-04-15/5-ways-integrate-sms-marketing-social-media-campaigns

Toda, M., Ezoe, S., Nishi, A., Mukai, T., Goto, M., & Morimoto, K. (2008). Mobile phone dependence of female students and perceived parental rearing attitudes. *Social Behavior and Personality: An International Journal*, *36*(6), 765–770.

Tukey, J. (1977). Exploratory data analysis. Retrieved from https://pdfs.semanticscholar.org/2f40/fd06bc9fd00a27437e14ed171e96e4fd9326.pdf

Twenge, J. (2010). A review of the empirical evidence on generational differences in work attitudes. *Journal of Business and Psychology*, *25*(2), 201–210. https://doi.org/10.1007/s10869-010-9165-6

Twenge, J. (2014). *Generation Me-Revised and Updated: Why Today's Young Americans Are More Confident, Assertive, Entitled--and More Miserable Than Ever Before*. Simon and Schuster.

Twilio (2018) How Consumers Use Messaging Today at: https://www.twilio.com/learn/commerce-communications/how-consumers-use-messaging/ Accessed 4/9/2018.

Underwood, C. (2017) Generational Imperative: Say hello to Americas 5 living generations. Retrieved from http://www.genimperative.com/ http://genimperative.com/americas-living-generations/

United States Bureau of Labor Statistics (2018). *State employment and unemployment — February 2018.* Retrieved from https://www.bls.gov/news.release/pdf/laus.pdf

United States Census (2017). *Educational Attainment in the United States: 2017)* Retrieved from https://www.census.gov/data/tables/2017/demo/education-attainment/cps-detailed-tables.html

United States Census (2017). *National Population by Characteristics Datasets: 2010-2016 - Annual estimates of the resident population by single year of age and sex for the United States: April 1, 2010 to July 1, 2016 (NC-EST2016-AGESEX-RES)* Retrieved from https://www.census.gov/data/datasets/2016/demo/popest/nation-detail.html

Usability.gov. (n.d.). Washington, DC: U.S. Department of Health and Human Services.www.usability.gov

Valentine, J., Aloe, A., & Lau, T. (2015). Life after NHST: How to describe your data without "p-ing" everywhere. *Basic and Applied Social Psychology, 37*(5), 260-273. http://dx.doi.org/10.1080/01973533.2015.1060240

Valenzuela, S., Park, N., & Kee, K. (2009). Is there social capital in a social network site? Facebook use and college students' life satisfaction, trust and participation. *Journal of Computer-Mediated Communication, 14*(4), 875-901. https://doi.org/10.1111/j.1083-6101.2009.01474

Valkenburg, P., & Peter, J. (2011). Adolescents' online communication: An integrated model of its attraction, opportunities, and risks. *Journal of Adolescent Health, 48,* 121–127. https://doi.org/10.1016/j.jadohealth.2010.08.020

Van Buuren, S. (2012). *Flexible imputation of missing data*. CRC press.

Van Cleemput, K. (2010). "I'll See You on IM, Text, or Call You": A Social Network Approach of Adolescents' Use of Communication Media. *Bulletin of Science, Technology & Society, 30*(2), 75–85. https://doi.org/10.1177/0270467610363143

Van Volkom, M., Stapley, J., & Amaturo, V. (2014). Revisiting the Digital Divide: Generational Differences in Technology Use in Everyday Life. *North American Journal of Psychology*, *16*(3), 557–574.

Waldeck, J. & Dougherty, K. (2012). Collaborative communication technologies and learning in college courses: Which are used, for what purposes, and to what ends? *Learning, Media and Technology, 37*(4), 355-378. http://dx.doi.org/10.1080/17439884.2011.592497

Watkins, M., Amaya, I., Keller, P., Hughes, M., & Beck, E. (2011). Autonomous detection of distracted driving by cell phone. *IEEE Conference on Intelligent Transportation Systems, Proceedings, ITSC*, 1960–1965. https://doi.org/10.1109/ITSC.2011.6083026

White, M., Eiser, J., & Harris, P. (2004). Risk perceptions of mobile phone use while driving. *Risk Analysis: An Official Publication of the Society for Risk Analysis*, *24*(2), 323–334. https://doi.org/10.1111/j.0272-4332.2004.00434.x

Winkler, J., Kanouse, D., & Ware, J. (1982). Controlling for acquiescence response set in scale development. *Journal of Applied Psychology*, *67*(5), 555-561. http://dx.doi.org/10.1037/0021-9010.67.5.555

Winston, B., & Winston, B. (1998). *Media technology and Society - A History: from the Telegraph to the Internet*. London, Routledge.

Xia, Y. (2012). "Chinese Use of Mobile Texting for Social Interactions: Cultural Implications in the Use of Communication Technology." *Intercultural Communication Studies 21*(2).

Yap, J. (2012). Voice assistants useful, but adoption slow. *Ziff-Davis*. Available at: http://www.zdnet.com/article/voice-assistants-useful-but-adoption-slow Accessed 3/17/2017.

Yousuf, M. (2007). Using experts' opinions through Delphi technique. *Practical Assessment, Research & Evaluation, 12*(4), 1-8.

Zemke, R., Raines, C., & Filipczak, B. (2000). *Generations at work*. American Management Association, New York. New York, NY.

Zhou J., Rau P., & Salvendy G. (2014) Age-related difference in the use of mobile phones. *Universal Access in the Information Society, 13*(4), 401-413. https://doi.org/10.1007/s10209-013-0324-1

Zurovac D., Talisuna A., & Snow R. (2012) Mobile Phone Text Messaging: Tool for Malaria Control in Africa. *PLoS Med*icine *9*(2), 1-6. https://doi.org/10.1371/journal.pmed.1001176