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Communication accommodation in text messages: Exploring liking, power, and sex as predictors of textisms

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ABSTRACT

This mixed-methods study applies Communication Accommodation Theory to explore how liking, power, and sex predict one's likelihood for using textisms in digital interpersonal interactions. Textisms are digital cues that convey nonverbal meaning and emotion in text communication. The main experiment used a hypothetical texting scenario to manipulate textism amounts (none/many) and participant's perceived power levels (low/equal/high) during texting interactions to examine the number of textisms participants used in subsequent responses in comparison to the number of textisms they viewed. Primary results show that (1) participants moderately converged to use similar amounts of textisms, and (2) those with low power who viewed many textisms were more likely to use textisms themselves during subsequent responses. Through the examination of adaption behaviors in text messaging, scholars can better understand the contexts in which users will include textisms to intentionally convey nonverbal meaning and emotion in digital communication.

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Digital; interpersonal; nonverbal cues; textisms; text messaging

Mobile devices are ubiquitous social tools capable of extending interpersonal relationships through digital communication. A 2015 Pew Research report indicates that 64% of American adults own a smart phone, and 97% of them send text messages (Smith & Page, 2015). Though some people compose relational text messages using proper spelling and grammar, others utilize non-standard textual cues such as emoticons, intentional misspellings, and exaggerated capitalizations. These digital cues convey relational meaning, personality, and emotion in mediated interpersonal interactions. Studies describe and organize these emergent cues with several labels, such as *cyberlanguage* (Christopherson, 2011), *textual adaptations* (Cingel & Sundar, 2012), *textese* (Drouin & Driver, 2014), *textisms* (Kemp, 2010; Kemp & Bushnell, 2011; Powell & Dixon, 2011), and *computer-mediated communication cues* (Vandergriff, 2013). To categorize this wide assortment of digital nonverbal cues, this study utilizes the overarching label of *textisms*.

Research on textisms is at an early stage of development. Though existing scholarship examines the effect of textisms on outcomes related to cell phone etiquette (Forgays, Hyman, & Schreiber, 2014), literacy skills (Drouin & Driver, 2014; Kemp, 2010; Kemp & Bushnell, 2011; Powell & Dixon, 2011), grammatical stylizations (Cingel & Sundar, 2012), punctuation patterns (Baron & Ling, 2011), and learning (Vandergriff, 2013), few studies examine textisms through an interpersonal lens. Several questions exist in this domain: Under what social contexts are individuals more likely to utilize textisms? How do relational factors impact a user's decision to integrate textisms into text messages specifically? The goal of this research is to explore relational factors (viz., liking, power dynamics, and sex) to better predict the contexts in which users are more likely to integrate textisms in digital interpersonal interactions.

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Explicating textisms as digital nonverbal cues

Nonverbal communication refers to the process in which information is transferred and interpreted without the direct use of words. It includes all aspects of a message besides the verbal component (Burgoon, Floyd, & Guerrero, 2010; Wood, 2011). Most research on nonverbal communication explores this phenomenon from a Face-to-Face (FtF) perspective. In fact, early Computer-Mediated Communication (CMC) studies claimed that nonverbal cues did not function in text interaction and were simply filtered out (Daft & Lengel, 1986; Short, Williams, & Christie, 1976; Sproull & Kiesler, 1986). In opposition to this perspective, *Social Information Processing Theory* (SIPT: Walther, 1992, 2006; Walther & Ramirez, 2010) describes how interlocutors express nonverbal indicators of mood and emotion in CMC. The theory asserts that FtF nonverbal cues can be translated into digital cues (when given adequate time), and it provides a foundation to describe how people can utilize creative keyboard-based cues to convey nonverbal information within digital communication (Walther, 1992).

To organize and categorize different types of text-based nonverbal cues, Walther (1992) identified seven original examples of *electronic paralinguistic devices* that function through keyboard symbols: (1) relational icons; (2) intentional misspellings; (3) lexical surrogates; (4) spatial arrays; (5) grammatical markers; (6) capitalizations; and (7) the absence of corrections. Within these seven cues, three are elaborated on as examples. First, *relational icons* (emoticons) add emotional content to a message through keyboard-based facial depictions, such as :). *Intentional misspellings* include the repetition of a vowel and are often used to draw out the pronunciation of a word (e.g., how are yoooouuu?) Lastly, capitalization can be used in unconventional ways to add insult, emphasis, or volume (e.g., YAWN). Such devices exemplify the ways that verbal textual indicators can function as nonverbal behaviors in digital contexts.

These broad examples also show how defining and organizing textisms is challenging. Multiple textism types often coexist in a word (e.g., how are youuUUUu?) and users continually adapt and create emergent text-based cues with idiosyncratic meanings. The variety of cues available is potentially limitless and only confined by a user's individual level of creativity. Still, it is possible to create a degree of consistency within this grouping by clearly defining textisms according to what they have in common. Just as nonverbal cues are essentially defined by their opposites (verbal cues), we define textisms using a similar logic. Textisms are defined as unconventional digital cues that convey nonverbal information in text communication; they include all aspects of a text message outside of the region's conventional spelling and punctuation (this study uses Standard American English).

An important distinction exists between textisms and traditional FtF nonverbal cues. Whereas FtF nonverbals often function on an unconscious level (Burgoon, Guerrero, Floyd 2016), textism usage is an inherently intentional process. Although an emoticon in CMC may perform a similar function as a smile in FtF communication, it should not be considered an equivalent behavior. This is because emoticon usage is deliberate, while traditional nonverbal behaviors are often unplanned (Derks, Bos, & Von Grumbkow, 2007; Walther & D'Addario, 2001). Nervous feelings experienced during mediated interactions can be easily masked. For example, an individual can utilize an emoticon to convey anxiety (such as ^_^;) but is often unlikely to include one in CMC. Thus, textisms can substitute for nonverbals, but they are not equivalent. Textisms should be considered an inherently deliberate and conscious form of nonverbal interaction in text communication instead. Because of this distinct difference, a digital medium affords users the opportunity to more strategically select when and what textisms to use as a substitution for their nonverbal cues.

Communication accommodation theory and textisms

Little research explores the context in which users will choose to integrate a textism into their digital communication. Because textisms function as a component of social behavior, scholars can turn to communication theory to explain and predict their usages. One area of theoretical development to

consider is interpersonal adaptation. Interpersonal adaptation refers to a process in which people adapt their verbal and nonverbal behaviors to their interdependent conversational partners (Burgoon, Dunbar, & Giles, 2017; Burgoon, Stern, & Dillman, 1995). Typical studies on interpersonal adaptation refer to an assortment of related terms, including coordination, responsiveness, and accommodation (Tickle-Degnen, 2006). From a communication perspective, one of the most widely utilized theories is *Communication Accommodation Theory* (CAT; Giles, 1973, 2008, 2016), which describes how people adapt their behaviors in interpersonal and intergroup contexts using verbal and nonverbal strategies to accommodate a conversational partner. This Study invokes CAT as a framework to better predict and examine the ways relational factors predict textism usages.

Several key features of CAT address interpersonal adaptation (for a review, see Dragojevic, Gasiorek, & Giles, 2016). Among other CAT language strategies, CAT explains how people will adapt their conversation style to either *converge* (i.e., show similarity within verbal or nonverbal communication to move toward one's chat partner) or *diverge* (i.e., show dissimilarity within verbal or nonverbal communication to move away from one's chat partner). In some instances, a person may neither converge nor diverge; this is referred to as a non-accommodative function and occurs when a person's behavior is not adapted to one's conversational partner.

Although many relational factors have the potential to impact the likelihood of interpersonal adaptation, liking and power dynamics are two of the most well-known. When an interlocutor seeks to convey liking, interpersonal attraction, or social approval, they are likely to converge in their communicative behaviors to move toward their chat partner. Similarly, when communicators possess less situational power, they are more likely to converge toward those who rank higher in situational power (Giles, 2008; Merrill & Hernandez, 2013). Given that liking and power predict convergence in traditional FtF interaction, this study generalizes liking and power as variables that should predict convergence in CMC.

It is worth noting that convergence in communication styles can occur on multiple levels. For example, if two users both use smiley-face emoticons in a text message, convergence is present on two levels: the message matches the same type of emotional-display (smiling), and the message matches the same type of representation used to convey the emotion (an emoticon). However, if one uses a smiley-face emoticon and another returns the phrase "I'm smiling" in response, though convergence is occurring on an emotional-display level (smiling) there is a divergence in the representation of the display because the message is presented in words rather than through a textism. Though there are several ways to indicate convergence and divergence in communication style, this study broadly looks at the convergence of textism usage. We explore the ways that interpersonal variables play a role in predicting the context in which individuals will move toward one another in the number of textisms they are using. Because users consciously decide whether to include a textism or not, a conversation that has a similar number of textisms between sender and receiver is considered to be convergent, as both communicators in this instance are using textisms to represent nonverbal behaviors, regardless of textism type.

A burgeoning area of literature already suggests CAT is relevant across various types of communication modalities. Buzzanell, Burrell, Stafford, and Berkowitz (1996) conducted an experiment guided by CAT that manipulated an instructor's outgoing voicemail message. They found that students converge with some levels of the message (such as interpersonal qualities) but not others (such as message structure). Convergence also occurs in mediated e-mail contexts, with users converging with another in politeness markings (Bunz & Campbell, 2004) and in instant-messaging conversations between contexts involving users who are both friends and users within zero-history interactions (Riordan, Markman, & Stewart, 2013). Similarly, online chat room participants converge in emoticon usage as a signal of flirtation (Fullwood, Orchard, & Floyd, 2013). Mediated accommodation research finds divergent behaviors as well. In a study examining instant-message conversations between librarians and students, findings show that individuals diverge in chat style: Students use an informal style, and librarians use a formal style (Christopherson, 2011).

CAT is also applied to examine conversations on Twitter, with results showing that conversational pairs converge when using tentative or negative language in tweets but diverge when using more certain and positive language (Danescu-Niculescu-Mizel, Gamon, & Dumais, 2011). In a similar analysis examining a network of 189,000 twitters users, findings indicate that accommodation occurs with users matching their linguistic style to different online groups (Tamburrini, Cinnirella, Jansen, & Bryden, 2015). CAT is additionally invoked as a framework to explore how power influences linguistic style in mediated work group communication: Lower power individuals are more likely to adapt their linguistic style to become similar to their higher power partners (Muir, Joinson, Cotterill, & Dewdney, 2017).

In summary, CAT offers a perspective that explains and predicts how people may converge or diverge in mediated interpersonal interaction. However, when CAT first evolved as a theory, it primarily originated from research examining traditional FtF behaviors. Although the research reviewed above shows that CAT functions across multiple types of modalities, scholarly investigation must continue to push the boundaries of the theory to explain how differences between FtF nonverbals and mediated nonverbals may impact accommodation behaviors. For example, as previously discussed, textism usage is an inherently more conscious and deliberate process than FtF nonverbals. In contrast, scholarship on CAT posits that the process of adaptation is often an unconscious one (Dragojevic et al., 2016). This raises the question, when interactants consciously and deliberately use textisms as nonverbals in digital communication, do they follow accommodation patterns as the theory predicts?

It is unknown to what degree accommodation occurs when examining textisms in digital communication due to the strategic nature of textism usages. Although the goal of this research is primarily to explore relational factors to better predict the contexts in which users are more likely to integrate textisms in digital interaction, this study also contributes to CAT's theoretical considerations in two primary ways. First, this study extends research on mediated adaptation to continue exploring digital accommodation more broadly; second, this study explores the degree to which CAT occurs for intentional digital nonverbal cues (textisms).

In summary, (1) when message senders view the nonverbal behavior of a chat partner, they tend to adapt similar nonverbal behaviors to move toward their chat partner. More specifically, (2) when they want to convey liking or (3) when communicating with someone who has higher power, they are more likely to move toward their chat partner in their nonverbal behaviors. This study predicts that CAT should still apply when nonverbal behaviors are used strategically: A user who views textisms may adapt to their partner and use more textisms in response than a person who views no textisms. More specifically, a user should also converge to use a similar number of textisms. Thus, the following hypotheses are put forth regarding textism usage, convergence, liking, and power:

H_{1a}: Participants who view messages with many textisms will use more textisms in their own responses in comparison to participants who view messages with no textisms.

H_{1b}: There will be an interaction between the number of textisms a participant views (none or many) and the power level a participant has (low, equal, or high) that will contribute to participants using different numbers of textisms.

H_2: After viewing a text message, participants will converge in the number of textisms they use.

H_3: After viewing a text message, participants who like their chat partner will converge more in the number of textisms they use.

H_4: After viewing a text message, participants who have less power will converge more in the number of textisms they use.

Sex, accommodation, and textism usage

A person's biological sex may also influence textism usage and the degree that they enact accommodative behaviors. Decades of research on FtF communication suggests that females and males sometimes use different communicative strategies (Mulac, Bradac, & Gibbons, 2001). To name a few examples: Females are more likely to express nonverbal behaviors associated with joy, sadness, and anger (Fernandez, Carrera, Sanchez, Paez, & Candia, 2000), affiliation, immediacy, and intimacy (Aiello, 1977; Mehrabian, 1971), and they tend to adopt closer conversational distance, use more eye contact, and smile more than males (Aiello, 1972).

One theory that can help to explain the contexts in which females and males communicate differently is *Self-Categorization Theory*. According to Self-Categorization Theory (SCT; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), a person's self-concept is largely informed by their group memberships. When a person's group category is made salient, people tend to communicate as a prototypical member of their specific group (Hornsey, 2008). In testing this perception, Reid, Keerie, and Palomares (2003) manipulated the salience of participant's identities to explore the subsequent impact on language usage between females and males. They found that when a shared student-identity was made salient for mixed-sex dyads, both sexes used the same amount of tentative language. However, when individual gender identity was made salient, females used more tentative language than males. Thus, SCT helps explain why males and females may be likely to communicate differently depending on the context of the interaction.

Another similar phenomenon that helps scholars understand differences in communication styles between females and males is the *gender-linked language effect* (GLLE; Mulac, 2006). This effect describes a consistent finding in the literature, showing that even when a message receiver does not know the sex of the message sender, message receivers tend to rate female communicators higher on socio-intellectual status and aesthetic quality, but male communicators are rated higher on dynamism. In a model that seeks to explain the underlying mechanisms that account for this effect, Mulac, Giles, Bradac, and Palomares (2013) posit that females and males likely possess a set of social schemata, or ways of understanding and categorizing communication, that are consistent with behaviors perceived to be socially normative for one's gender. In this vein, an interlocutor's schema of normative behaviors likely informs a person's *display rules* for their biological sex: the socially taught norms that guide a person's acceptable display of nonverbal behavior (Fernandez et al., 2000).

An important component of the GLLE model draws upon theoretical considerations that come directly from CAT. From a gender communication perspective, the model predicts that sex will influence accommodation, such that users will linguistically adapt to one's message receiver depending on if they are communicating with a female or male. For example, Hogg (1985) found that males diverged in their communication when talking with females to exhibit a more masculine persona. However, as one component of a larger test of the GLLE, Mulac et al. (2013) examined differences in communication between message senders who constructed messages either for males or females and found no gender effect for adaptation. Thus, adapting a message for a particular gender is not always a predictive mechanism for accommodation strategies.

Beyond FtF interaction, studies on mediated nonverbal behavior explore the different ways females and males may utilize textisms differently. Baron and Ling (2011) used focus groups to examine textism behavior among adolescents: Though females reported using emotional cues to show enthusiasm (e.g., emoticons and exclamation points), males reported their reluctance to use these cues. Drouin and Driver (2014) conducted a survey to examine the naturalistic data of text message transcripts; however, results showed that gender had no impact on outcomes related to textisms in their study.

Regarding accommodation and differences between males and females during CMC specifically, Palomares and Lee (2010) examined users in mediated communication who were assigned avatars that either matched or did not match the gender identity of the user. Findings showed that when a user's gender identity matched their avatars, they were more likely to use consistent gender-

normative language. However, participants who had avatars that did not match their gender identity used language not typical of their own personal gender identity but language that matched their avatars. Thus, these users adjusted their behavior based on the social schemata of normative behavior expectations associated with the sex of their avatar. This is consistent with both the GLLE (Mulac et al., 2013) and SCT (Turner et al., 1987).

In sum, much research explores the ways that biological sex may impact a user's perceived membership group and their social identity. Although a nuanced discussion on the effect of gender identity and one's biologically assigned sex is beyond the scope of this research, the studies reviewed so far indicate that (1) females and males are likely to exhibit different display rules when it comes to enacting their socially learned gendered communication, and (2) when one's gender identity is made salient, users will be more likely to enact the normative behaviors of their gender.

However, in a mediated text messaging environment, it is likely uncommon for one's gender identity to be particularly salient. Thus, this study examines textism utilizations and behaviors from the perspective that a person's gender identity is based on normative perceptions and should persist to some degree without being made salient (as is predicted in the GLLE; Mulac et al., 2013). To explore textisms through the lens of CAT further, this study predicts that females may be more likely to use textisms as nonverbal behaviors more than male participants because it may be more socially acceptable for females to enact nonverbal displays of emotion. Additionally, studies on CAT show that effective communication for females communicating in mixed-sex dyads depends on the degree that a female adapts appropriately to the conversational biases of males (Reid, Palomares, Anderson, & Bondad-Brown, 2009). Thus, by extending, the lens of CAT to CMC, it is also predicted that females will be more likely to converge in textism usage. Given what is known regarding the impact of one's biological sex in predicting accommodative behaviors, the following additional hypotheses are put forth for empirical testing:

H_5: Female participants will use more textisms than male participants.

H_6: After viewing a text message, female participants will converge more in the number of textisms they use.

Method

A sequential mixed-method design analyzed both qualitative and quantitative data from two different data collection stages using an embedded approach. In an embedded approach, one data type supports and plays a secondary role to a primary data type. The two data sets are not weighed entirely equally, but both are considered concurrently in the final stage of interpretation and discussion (Creswell & Plano Clark, 2007; Myers, 2014). Following this embedded approach, Study 1 explored textism usages, while Study 2 directly tested the hypotheses in a controlled manner. Following explanation of the procedures and results for each study, the general discussion outlines key findings from Study 1 and Study 2 simultaneously.

Method for Study 1: Naturalistic text messages

The purpose of Study 1 was to develop a codebook to begin categorizing, organizing, and counting textism types. Study 1 functioned as an initial investigation in exploring what factors impact textism utilizations. In addition to developing the codebook, we performed a set of basic analyses to examine the degree that convergence occurred in natural text messages and the extent that liking, power, and sex explained the utilization of textism numbers (where the natural data allowed for such analyses).

Participants

College students ($N = 282$) enrolled in communication courses at a large western university received a nominal amount of course credit for volunteering to participate in Study 1. Participants included the following demographics: 60.3% females and 39.7% males with a mean age of 19.98 years ($SD = 1.43$). With respect to ethnicity, 2.8% were Black or African American, 44.1% were Caucasian or white, 20.6% were East Asian, .4% was Indigenous or Aboriginal, 17.4% were Latina/o, 7.8% were multiracial, 2.5% were Middle Eastern or Arab, 1.4% were South or Indian, and 2.8% reported ethnicity as an "other" category.

Procedure

Participants completed an online questionnaire hosted by SurveyGizmo that began with a consent form and a measure of demographics. Next, the questionnaire collected naturalistic text message screenshots. Participants used their smart phone to take five separate screenshots that showed a back-and-forth text message interaction with five different people. Participants uploaded each screenshot to the survey and answered brief questions about their chat partner related to their partner's sex, liking toward the receiver, and power.

Coding of natural text messages

In total, participants submitted 889 text message screenshots (see Appendix A[1] for examples). Using these naturalistic text messages, we created a preliminary version of our coding scheme following Hsieh and Shannon's (2005) summative approach to content analysis. In this process, we used Walther's (1992) seven electronic paralinguistic devices as a foundation for coding textisms. We added additional textism types as they emerged through an iterative coding process (for a more thorough review on how the coding scheme developed, (see Adams, Miles, & Dunbar, 2017). Thus, we created a working codebook that outlined the following 12 textism codes: (1) abbreviations; (2) acronyms; (3) capitals-lowercase; (4) capitals-uppercase; (5) corrections-absent; (6) emojis; (7) emoticons; (8) lexical-surrogates; (9) misspellings-intentional; (10) markers-extra; (11) markers-missing; and (12) spatial-arrays (see the final coding scheme included in Appendix B).

Using NVivo, a qualitative data analysis and coding software tool, textism coding took place at the individual word-level unit of analysis. Two trained undergraduate research assistants coded the same data subset (20% of the data, $n = 174$) to establish an acceptable level of inter-coder reliability before coding the remainder of the data. As mentioned previously, textism utilization and interpretation is a creative and subjective process. When the coders disagreed in the number of textisms present, the total number of textisms was averaged between the two coders. After obtaining a high degree of inter-coder reliability ($ICC = .94$), the research assistants divided and coded the remaining text message screenshots ($n = 715$) to count and record the number of textisms used by both the message sender and receiver. Additional reliability checks were not pursued given the exploratory nature of Study 1. Table 1 (see Appendix C) displays the number of each textism type coded in the natural text message data using the initial codebook.

Measures

Because the purpose of this data was to generate a codebook, the measures in Study 1 were not designed to thoroughly assess the variables of interest. Nonetheless, the following single-item measures helped inform our baseline understandings.

Liking. A single-item 7-point Likert scale measured liking of one's chat partner: "You generally like this person" ("strongly disagree" to "strongly agree," 1–7). Average responses were high ($M = 6.13$, $SD = .95$). For further analysis, this measure was recoded into a categorical variable with responses of 1–4 categorized as a low degree of liking ($n = 37$) and responses of 5–7 categorized as a high degree of liking ($n = 827$). Although the data in these groupings was not equitable, this served as a starting point for exploring liking in the naturalistic messages.

Power. A single-item 7-point Likert scale measured perceived power held by the participant: "This person has more power in the relationship than you do" ("strongly disagree" to "strongly agree," 1–7). This question was reverse-coded to indicate the amount of perceived power a participant held (M = 4.50, SD = 1.49). For further analysis, this measure was recoded into a categorical variable with responses at the midpoint of the scale coded as equal power dyads (n = 317) and all other responses coded as unequal power dyads (n = 549).

Convergence. Coders counted and reported the number of textisms sent by the sender and receiver of each text message screenshot to examine whether senders and receivers used similar numbers of textisms. This study measured convergence utilizing a test of the *Intraclass correlation coefficient* (ICC; Shrout & Fleiss, 1979). The ICC represents the correlation between different data observations to examine the extent that the data (either a single rating or an average) resemble other data points. Using reliability analysis, SPSS can be used to calculate the ICC. For all analyses of the ICC, this study uses a one-way random test (with a 95% confidence interval and a test value of 0). Thus, convergence can be assessed in a way that is similar to a correlational analysis (with a possible ICC value ranging between -1 to 1).

Results for Study 1

Regarding the degree that convergence was observed in the naturalistic data, we compared the number of textisms used by senders and receivers. The ICC indicated that senders and receivers displayed a moderate level of convergence (ICC = .44) with a 95% confidence interval from .36 to .51, $F(864) = 1.77$, $p < .001$. Thus, users moderately converged in their utilization of textisms.

Regarding the degree that liking impacted textism usages, an independent-samples t-test found that participants who indicated greater liking toward their partner used more textisms (M = 1.78, SD = .84) compared to participants who indicated less liking toward their partner (M = 1.44, SD = .54). These differences were statistically significant $t(862) = -2.46$, $p = .014$.

To examine the degree power impacted textism usages, we performed an independent-samples t-test to examine differences between equal and unequal power groups. When participants perceived equal power, dyads used relatively similar numbers of textisms (M = 1.69, SD = .78) compared to dyads that had unequal power (M = 1.80, SD = .87). However, differences were approaching significance $t(864) = 1.91$, $p = .056$.

Regarding the degree that sex impacted textism usages, text message screenshots composed of female-only dyads (N = 333) were examined in comparison to screenshots composed of male-only dyads (N = 202). Mixed-sex dyads were not analyzed because the sex of the message sender/receiver was unclear from the naturalistic text message screenshots alone. To compare the average number of textisms used by females and males, we used an independent-samples t-test and found that female-only dyads did indeed use more textisms (M = 1.92, SD = 1.16) in comparison to male-only dyads (M = 1.66, SD = .92). This difference was statistically significant $t(533) = 2.72$, $p = .007$.

Method for Study 2: Main experiment

Study 2 directly tested our hypotheses in a controlled manner: A 2 × 3 experimental design manipulated the number of textisms (none/many) and the power levels of the participants (low/equal/high) in hypothetical text message interactions to formally examine the effect of liking, power, and sex on the number of textisms used by participants. Participants read and responded to these hypothetical text messages.

Participants

An analysis of power using the mean effect size reported in social psychology (r = .21; Richard, Bond, & Stokes-Zoota, 2003) at 70% power indicated that 180 participants were needed to find an effect when examining participants between three groups (low/equal/high power), and 142

participants were needed to find an effect when examining participants between two groups (no textisms/many textisms). Study 2 recruited college students (N = 182) enrolled in Communication courses at a large western university who received a nominal amount of course credit for volunteering to participate. Participants included the following demographics: 57.7% females and 42.3% males with a mean age of 20.07 years (*SD* = 1.51). With respect to ethnicity, 4.4% were Black or African American, 40.1% were Caucasian or white, 24.7% were East Asian, 11% were Latina/o, 4.9% were multiracial, 2.2% were Middle Eastern or Arab, 4.9% were South or Indian and 7.7% reported ethnicity as an "other" category.

Procedure

Participants completed an online questionnaire hosted by SurveyGizmo. The questionnaire began with a consent form and a measure of demographics. Next, participants read a hypothetical scenario that asked them to imagine they were interacting with a classmate for the first time via text message. Participants typed a text-message to introduce themselves; this served as a baseline measure of each participant's typical textism usage. Next, the questionnaire randomly assigned participants to one of six experimental conditions. In each condition, participants viewed and responded to nine manipulated text messages that featured either no textisms or many textisms (varying between 4–11 per text message); these messages also manipulated features of power levels (low, equal, or high). Including the baseline measure, participants viewed and responded to a total of 10 text messages in the form of a back-and-forth imaginary conversation. Following the manipulation, participants completed measures of power, typicality, and liking.

Stimuli

This experiment randomly assigned participants to read and respond to hypothetical text messages producing a back-and-forth mock interaction. For each hypothetical text message scenario, we created the same general story for participants to interact in (e.g., "Imagine you are taking a class online and the teacher has paired you with a fellow student to work on 2 group papers together."). The story guided participants through this hypothetical interaction. Prior to viewing any manipulated content, the story asked participants to type a message to introduce themselves to their class mate (e.g. "A few days later, you decide to send your partner a text message to introduce yourself.") to acquire a baseline of textism behaviors. Though participants typed their text messages on a keyboard, a picture of a text message screen was placed on the questionnaire to prime text-message behaviors and improve external validity.

After participants constructed their introductory message, the questionnaire randomly assigned participants to one of six (2 × 3) experimental conditions. The experimental conditions manipulated (1) the amount of textisms (none/many) that participants viewed across nine separate text messages; and (2) it manipulated the power level (low/equal/high) of the respondent's hypothetical interactional partner in the scenario (see Appendix D for all stimuli and materials).

Manipulation of textism number. The number of textisms in the "no" textism condition was held constant at 0 across the nine text messages encounters. The number of textisms in the "many" textism condition varied between 4–11 across the nine text message encounters so that the quantity of textisms appeared to fluctuate naturally (as they appear in normal texting interactions). The hypothetical text message wording remained consistent between the two conditions except for the conversion of Standard American English to textisms. For example, a message with no textisms read "What do you normally like to do in a group project?" whereas a message with 4 textisms read "what do u normally like to do in a grp project:)?"

Manipulation of power amounts

The story scenario contained the manipulated levels of power (low, equal, high) between conditions. To do this, the story assigned a grade to a group paper that the participant "earned" in collaboration

with their hypothetical interactional partner. This grade justified the participant in the narrative in either giving away power, maintaining equally power, or taking power (for a summary of the power manipulation, see Appendix D). This was designed to create a sense of varying power levels between the participant and the hypothetical partner. So as not to confound the "grade" that is earned between the scenarios with the manipulation of power, all participants in the story ended the class earning an A on their final collaborative paper.

Coding. In total, participants generated 1,820 text message responses. Before coding the text messages, an assessment of our previously drafted 12 textism coding scheme was performed. Using Bakeman and Gottmann's (1997) considerations for coding scheme development, textisms were re-classified via the "splitting and lumping" process to create 15 distinct categories: (1) action-simulators; (2) cases-lower; (3) cases-upper; (4) emojis; (5) emoticons; (6) lexical-surrogates; (7) markers-extra; (8) markers-missing; (9); spatial-arrays; (10) word-expansions; (11) word-shorteners; (12) phrase-shorteners; (13) word-glitches; (14) word-#substitutions; and (15) undefined (for a more thorough review on how the coding scheme developed, (see Adams, Miles, & Dunbar, 2017). Coding following this final scheme (Appendix B) was completed using NVivo, a qualitative data analysis and coding software tool.

Before coding the complete data set, five undergraduate research assistants coded 10% of the same data (n = 182 text messages) to first establish an acceptable level of inter-coder reliability. When the coders disagreed in the number of textisms present, the total number of textisms was averaged between the five coders. After a high degree of inter-coder reliability was established (ICC = .94), the remainder of the data were divided and coded separately. To examine whether the research assistants remained consistent throughout coding, one coder performed spot-checks and double-coded every 10 text messages throughout the data set. The coders maintained a high degree of inter-coder reliability (ICC = .92) indicating that minimal drift occurred. After coding the textisms in each message, coders counted and recorded the number of textisms. Table 2 (see Appendix C) displays the frequency of each textism type.

Measures

Power

This study adapted a measure to examine the degree of power perceived between the three different conditions (low/equal/high). This measure also served as a manipulation check to examine whether participants perceived power in the correct direction using six Likert-type items (ranging from 1–7; "strongly disagree" to "strongly agree"). An example item includes: "I felt like I had the most power" (see Appendix E). The reliability for this scale was high (α = .90).

Liking

This study created a measure to examine the degree of interpersonal attraction the participants felt toward their hypothetical chat partner using five Likert-type items (ranging from 1–7; "strongly disagree" to "strongly agree"). An example item includes: "Your partner is likable" (see Appendix E). The reliability for this scale was high (α = .92). This measure was recoded into a categorical variable with responses of 1–4 categorized as a low degree of liking (n = 44) and responses of 5–7 categorized as a high degree of liking (n = 138). The liking groups again resulted in numbers that were not comparable between conditions, though the data were still analyzed to examine whether differences emerged.

Typicality

As a type of manipulation check, this study created a measure to assess the degree that the text messages participants read and wrote appeared normal. Typicality was measured using a scale composed of two subscales: *typicality of the message* (3 items) and *self-typicality* (4 items). Both subscales were measured

using Likert-scale items (ranging from 1–7; "strongly disagree" to "strongly agree"). Example items respectively included "The texts I received were typical compared to other texts I have seen" and "The way I texted in the scenario represents how I usually text" (see Appendix E). Reliability for the typicality subscale (α = .84) and the self-typicality subscale (α = .87) were both high.

Results for Study 2: Main experiment

This report utilizes statistical software SPSS version 24 to analyze all data tested within the predicted hypotheses. As mentioned previously, the primary way in which this study measures convergence utilizes a test of the Intraclass correlation coefficient (ICC; Shrout & Fleiss, 1979).

Manipulation checks

Prior to analysis, we performed two manipulation checks. First the power manipulation check verified whether the experiment correctly induced perceptions of power differences between groups. A one-way ANOVA was computed: those in the low power condition (n = 62) perceived themselves to have the least power (M = 4.15, SD = .97); those in the equal power condition (n = 60) perceived themselves to have a more moderate degree of power, (M = 4.40, SD = 1.06); and those in the high-power condition (n = *60)* perceived themselves to have the highest degree of power (M = 4.82, SD = 1.07). These results were in the expected direction and significant: $F(2, 179) = 6.48$, $p = .002$, $R^2 = .068$. However, a post-hoc Tukey analysis indicated that, though the differences between low and high-power groups were significant ($p = .001$), the differences between power groups of equal/high ($p = .403$) and equal/low ($p = .065$) were not significant. The equal power group was conflated between the other two. As such, the equal power data were removed from the power analyses to focus on the difference between low and high-power conditions.

Second, an independent samples t-test examined the perceived typicality of the text messages: participants perceived text messages with no textisms as equally normal (M = 5.29, SD = 1.15) in comparison to text messages with many textisms (M = 5.14, SD 1.19). There was no significant difference between these groups: $t(180) = .88$, $p = .378$. We also examined perceived self-typicality in text-message responses through an independent samples t-test: Participants who viewed text messages with no textisms indicated that they responded equally as normal (M = 5.65, SD = 1.01) as those who saw text messages with many textisms (M = 5.85, SD = 1.04). There was no significant difference between these groups: $t(180) = -1.30$, $p = .195$. Therefore, both typicality measures indicated that participants reading messages with and without textisms perceived and responded to them normally; this enhances the overall external validity of the study.

In addition to the manipulation checks, this study examined the number of textisms used by participants across their nine text message responses in comparison to their baseline behavior. The ICC indicated that participants displayed a somewhat high level of similarity between their baseline measure and their subsequent usage of textisms (ICC = .60), with a 95% confidence interval for the average measures from .47 – .70, $F(181) = 2.53$, $p < .001$. This indicates that the number of textisms used by participants in response to the manipulated text messages varied by 30–53% from their baseline. This suggests the potential that participants responded differently in comparison to their baseline (perhaps indicating adaptation).

Hypothesis tests

H_{1a} predicted that participants who viewed messages with many textisms would use more textisms in their own responses in comparison to participants who viewed messages with no textisms. An independent samples t-test was computed to examine the differences in the number of textisms used between users who saw many textisms (n = 91) in comparison to those who saw no textisms (n = 91). Those who saw many textisms used more textisms (M = 16.70, SD = 8.94) than those

who saw no textisms (M = 13.21, SD = 7.93). This difference was statistically significant: $t(180)$ = -2.79, p = .006. Thus, hypothesis H_{1a} was supported.

H_{1b} predicted that there would be an interaction between the number of textisms a participant viewed (none or many) and the power level a participant had (low, equal, or high) that would contribute to participants using different numbers of textisms. Equal-power groups were removed due to the ineffectiveness of the manipulation. A one-way factorial ANOVA was computed to examine the average differences between groups across conditions featuring no textisms/many textisms and low/high power to view the impact on participant's subsequent textism usages. Overall, the model was statistically significant, $F(3, 118) = 5.19$, p = .002, R^2 = .117. Participants in the low-power group who saw textisms used the most textisms (M = 18.00, SD = 9.92); the low-power group who saw no textisms used a medium number of textisms (M = 14.10, SD = 8.77); the high-power group who saw textisms also used a medium number of textisms (M = 14.08, SD = 6.69); and the high-power group who saw no textisms used the least number of textisms (M = 10.15, SD = 5.84).

Given these results, we examined whether there was an interaction between the degree of power participants perceived and the number of textisms viewed in the manipulation. A univariate factorial analysis of variance found a significant main effect for power, $F(1, 118) = 7.31$, p = .008, R^2 = .058, and a significant main effect for textism conditions, $F(1, 118) = 7.24$, p = .008, R^2 = .058. However, there was no significant interaction between the two variables, $F(1, 118) = .00$, p = .992. Thus, H_{1b} was not supported.

H_2 predicted that after viewing a text message, participants would converge in the number of textisms they used. A test of the ICC indicated that senders and receivers displayed a low level of convergence (ICC = .21) with a 95% confidence interval from -.06 to .41, $F(181) = 1.26$, p = .059. This suggests that participants only converged in textism numbers to a small degree. Thus, hypothesis H_2 was partially supported.

H_3 predicted that after viewing a text message, participants who liked their chat partner would converge more in the number of textisms they used. The ICC indicated that those in the high liking (n = 138) group displayed more convergence (ICC = .28), with a 95% confidence interval of -.01 to .48, $F(137) = 1.39$, p = .028, in comparison to the low liking group (n = 44) who showed less convergence (ICC = -.07), with a 95% confidence interval of -.95 to .42, $F(43) = .94$, p = .583. Thus, H_3 was supported.

H_4 predicted that after viewing a text message, participants who had less power would converge more in the number of textisms they used. The ICC identified the degree that those in low- and high-power conditions used a similar number of textisms as seen in the manipulated text messages. The ICC indicated that those in the low power condition displayed a slightly smaller amount of convergence (ICC = .22), with a 95% confidence interval of -.29 to .53, $F(61) = 1.29$, p = .161, in comparison to the high power condition (ICC = .24), with a 95% confidence interval of -.27 to .54, $F(59) = 1.31$, p = .149. Therefore, H_4 was not supported.

H_5 predicted that female participants would use more textisms than male participants. An independent-samples t-test showed that females used an equal number of textisms (M = 14.97, SD = 8.45) compared to males (M = 14.93, SD = 8.87). This difference was not statistically significant: $t(180) = .03$, p = .973. Therefore, H_5 was not supported.

H_6 predicted that after viewing a text message, female participants would converge more in the number of textisms they used. The ICC indicated that females displayed more convergence (ICC = .27), with a 95% confidence interval of -.07 to .50, $F(104) = 1.37$, p = .057, in comparison to males who indicated a lower level of convergence (ICC = .12), with a 95% confidence interval of -.39 to .44, $F(76) = 1.13$, p = .291. Thus, H_6 was supported.

General discussion

This study applied CAT as a theoretical lens to examine how a person's relational liking, power dynamics, and biological sex predict one's likelihood for using textisms in convergent behaviors.

Study 1 showed that in a naturalistic setting: (a) senders and receivers moderately converged in the number of textisms used; (b) communicators who liked their chat partners more used more textisms; (c) power did not make a significant difference in the number of textisms used; and (d) female-only dyads used more textisms in comparison to male-only dyads. Examination in Study 2 indicated somewhat similar findings: (a) participants used more textisms after viewing a message with many textisms; (b) participants used the most textisms after viewing a message with many textisms and when they held less power; (c) senders and receivers converged to a small degree in the number of textisms used; (d) participants converged more when they liked their conversational partner; (e) lower power individuals did not converge more in textism utilizations; (f) females did not use more textisms; but (g) females did converge more in textism utilizations.

Regarding communication accommodation, the results of this study suggest that the number of textisms participants utilize is impacted by their partner's initial usage of textisms (by a small to moderate degree). These results are similar to Buzzanell et al.'s (1996) experiment in which they constructed manipulated voicemail messages to observe how participants subsequently responded to different types: their results also showed a moderate convergence of interpersonal qualities in a different medium. Importantly, our study here extends the boundaries of CAT to also show that convergence is likely to occur even for more intentional types of nonverbal displays in mediated interactions (i.e., textism usages).

Regarding liking, our naturalistic data shows that liking did indeed explain the number of textisms that users integrated into their text messages. When users liked their conversational partner more, they used more textisms. Similarly, results from our controlled experiment suggest that users are more likely to converge in textism usage when they like their partner as well. These results fit into past research, which shows that males and females in online chat rooms converge in emoticon usages as a sign of flirtation (Fullwood et al., 2013). This is also similar to the findings as seen in Muir, Joinson, Cotterill, and Dewdney (2016), which indicate that convergence online is related to liking. Study 2 suggests that CAT holds true for intentional accommodation, in addition to the previously accounted for unintentional accommodation. Future research in this area may further validate these results while seeking to explore specific types of textisms that fulfill this function. For example, emoticons are one specific type of textism that may improve perceptions of caring in mediated interaction (Adams, 2014) and may be especially suited to the study of accommodation behaviors . Further research in this area may benefit from examining specific types of textism usages rather than examining textisms as one aggregate group.

Regarding power, our results suggest a notable finding. Though participants in our naturalistic data did not indicate differences in textism numbers (when examining equal versus unequal power groups), our experimental data indicate that participants in low power are more likely to utilize textisms in comparison to those in high power. We suspect that this may be because a person who has more power and authority may be inclined to validate their status and model a higher standard of writing. For example, an advisor (high power) communicating with her advisee (low power) may type using Standard American English conventions to best model appropriate texting behavior. Inversely, a person in a lower power position may feel no obligation to model Standard American English conventions and seek to use textisms to improve the quality of their relationship. Thus, the advisee in a low power position may utilize more textisms than the advisor.

Regarding a message sender's sex, our results provide a valuable contribution to research on gender communication. In our naturalistic data, female-only dyads utilized more textisms; in the experimental data, females and males utilized textisms equally. These results may appear in opposition, but further investigation shows that they both fit within the context of past studies in two primary ways. First, Reid et al. (2003) used SCT as a lens in discussing the differences between male's and female's communication when their social gender identity was made salient versus when their student identity was made salient. The shared student identity contributed to no differences between their communication styles. Similarly, the main experiment in Study 2 also emphasized an essay grade to control for power. This may have inadvertently made our participant's student identities

more salient. Thus, the study's manipulation may have contributed toward creating a shared student identity, and this may have impacted male's and female's communication styles to be more equivalent.

Second, in explanation of our gender-related findings for Study 1, female-only dyads used more textisms than male-only dyads in a mediated environment when no particular identity was made salient given the naturalistic environment. This suggests that in the absence of a shared salient identity, users will likely behave in accordance with the normative behaviors that are appropriate for their gender as the GLLE suggests (Mulac et al., 2013). Therefore, the results from Study 1 and Study 2 both fit within the context of past literature given the methods and design in both studies.

Also relating to the message sender's sex, our results found that females converge more than males in textism usage. This fits within the context of earlier FtF research which suggested that females were more likely to adjust their nonverbal cues to match the style of their male partners (Giles, Coupland, & Coupland, 1991; Weitz, 1976); a dynamic that may be influenced by power relations. Because females historically held less institutional power (at the time of the Weitz study), females may have been socialized to adapt more accommodating display rules. Though this research may be outmoded, our results suggest that normative social schemata may still guide females in their displays of appropriate communication (Mulac et al., 2013). Thus, females may be more likely to converge to conversational partners in digital interpersonal interactions. It is likely that females converge more in an effort to accommodate their chat partner as is socially normative for their gender. Further research in this area should continue to consider contextual factors, such as intergroup dynamics, that impact socially-taught display rules related to a person's identified sex and gender identity (Palomares, Giles, Soliz, & Gallois, 2016).

Limitations

Study 1 is subject to limitations that impact interpretation of the results. First, with regards to sex, Study 2 may have unintentionally lowered the salience of sex by focusing on a shared student identity (obtaining a course grade). This makes the shared student identity somewhat of a confounding variable. Future research should focus on textism usage and sex without making other identities salient. For example, a similar textism study that manipulates gender salience would likely provide an effective manipulation. Second, regarding our liking variable, the groupings we constructed to compare differences between high and low levels were uneven in both our naturalistic and experimental data. Essentially, people were highly interpersonally attracted to their chat partners, even when chatting with a hypothetical-imagined other. In future studies, data must be specifically collected to better induce more disparate levels of liking in experimental designs and/or survey data must specifically seek out participant interactions in which low liking occurs.

Another limitation is that this study examined textisms as one large classification. To measure convergence, we examined the number of textisms used regardless of textism type. Though this may represent one form of convergence (as discussed previously), it does not capture convergence on all levels (such as the emotional-display level). Grouping textisms and counting them as an aggregate may not provide as detailed of an exploration as examining and comparing different types of textisms specifically. Instead, future research may look more deeply at the convergence of specific textism types in relation to accommodation. Through the examination of text messaging and adaptation behaviors, scholars can better understand the contexts in which users intentionally integrate textisms in digital interpersonal communication.

Note

1. This study's materials including manipulations, measures, frequency tables, codebook and example text messages are documented in the appendices available on Open Science Framework: https://osf.io/m8nd2/

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