THE TECHNOLOGICAL INSULARITY SCALE: A SCALE DEVELOPMENT

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Amanda Robyn Matthews, B.S., B.A.

_____________________________________
Dawn M. Gondoli, Director

Graduate Program in Psychology

Notre Dame, Indiana

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Abstract

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Technological insularity is defined as a psychological construct associated with technology-mediated communication in which the communicator is more isolated from and less mindful of the recipients or intended audience when engaged in computer-mediated communications than when engaged in face-to-face conversations. The development and administration of a scale, the “Technological Insularity Scale,” or “TIS,” which measures the construct “technological insularity,” is explained here. The psychometric quality of the TIS is supported by results of a factor analysis, and relationships found between the scale and social desirability, empathy, and social isolation scales. This study contributes the understanding of technology’s implications for personal and societal behavior. Implications for theory and research are discussed.
DEDICATION

To Mom and Dad, whose boundless love and support show me everyday the person I strive to be each day. I love you both past where the counting ends.
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INTRODUCTION

A multitude of differences between computer-mediated communication, or CMC, and face-to-face, or FTF, conversations has led to a change in the way individuals choose to communicate in CMC (Wood & Smith, 2001). It is proposed here that multiple factors, including informality, sensitivity, regulation, disclosure (openness), emotionality, anonymity (depersonalization), and homogeneity together result in the communicator feeling oneself to be more isolated from and less mindful of the recipients or intended audience when composing CMCs than when engaged in FTF conversations. In the present project, the construct “technological insularity” has been defined, and a scale, the “Technological Insularity Scale” or “TIS,” which measures the construct in comparison to FTF conversations, has been created and applied to a sample of undergraduates and adults. In addition, the TIS’s convergent validity is assessed by the inclusion of multiple comparison scales that are often used in research, and whose psychometric properties have been established. A short description of the importance and prevalence of technologically-mediated devices, differences between CMCs and FTF communications, distinct aspects of CMC, and the need for the creation and testing of a theoretically-grounded instrument to examine technological insularity will be discussed.
Growing numbers of individuals and organizations are relying on technology to accomplish many types of goals through ever-expanding modes of communication. Specifically, CMC is cited in research as offering many types of services, including asynchronous email, computer conferencing, bulletin boards, electronic databases, facsimiles, teletex, videotext (Rice, 1992), voice messaging (Gluck, Coliz, & Rosenbaum, 1991), and chatrooms (Liu, 2002; Halbert, 1999). With the increased use and importance of technology comes the recognition that the medium is in fact an “altered state of communication” (Vallee, Johansen, & Sprangler, 1975). As an example, it was concluded over twenty years ago (Kiesler, Siegel, & McGuire, 1984) that there are multiple social psychological aspects in CMC that differ from aspects available in FTF communications. Notably, Kiesler and colleagues (1984) identified six social psychological aspects by which CMC differs from more traditional modes of communications. These six social psychological aspects include: time and information processing pressures, absence of regulating feedback (also noted by Kraut, Lewis, & Swezney, 1982), dramaturgical weakness (an absence of nonverbal cues such as staring, touching, or gesturing), few status and position cues, social anonymity (also noted by Joinson, 1999; Postmes, Spears, Sakhel, & De Groot, 1999; Dietz-Uhler & Bishop-Clark, 2003; Davis, 2002), and computing norms and etiquette.

Kiesler and Sproull (1992) later note that CMC includes greater levels of self-disclosure, deindividuation, ignoring of social boundaries, and an ephemeral nature, thereby differentiating it from FTF conversations. In the same scholarly work, they also noted that two aspects of CMC combine to produce a relatively unstructured mode of communication. These two aspects are: CMC relies almost entirely on plain text to
convey messages, and the text that is relied on is ephemeral, or capable of appearing and
disappearing on the computer screen without any permanent effects (Kiesler & Sproull,
1992). The potential lack of permanence contributes to an unstructured mode of
communication, within which parts of messages can be eliminated, highlighted, or
ignored. Bellamy and Hanewicz (1999) also noted three ways in which CMC differs
significantly from FTF communication. First, in CMC, nonverbal gestures are missing as
informational cues for the definition of the situation. Second, verbal cues are frequently
absent from CMC but are present in FTF communication. Third, information related to
an individual’s social and personal characteristics (including a person’s role or status) are
substantially suppressed in CMC.

In addition, multiple research studies have focused on the effects of CMC’s
increased anonymity, obscurity, or vagueness, as compared to FTF conversations. As
one example, Dietz-Uhler and Bishop-Clark (2003) demonstrated that increased
anonymity in CMC can lead to “social loafing,” or the tendency of individuals persons to
exert less effort in a task when working in a group, as compared to when working alone,
and “diffusion of responsibility,” or the lack of explicit responsibility in a group. Davis
(2002) also highlighted that “bad behavior,” such as insults or inappropriate content, was
prevalent in CMCs, causing individuals to leave or avoid specific computer-based spaces.
In addition, Joinson (1999) noted that social desirability, or the willingness or desire to
please others with one’s behavior, lower in CMC. Postmes and colleagues (1999) noted
that deindividuation effects, or a relinquishing of a personal sense of identity, is more
prevalent in CMC, as compared to FTF conversations.
CMC’s increased use and importance has helped to generate theoretically-based explanations describing potential differences of CMC from FTF conversations. Because of the increasing number of individuals who are using computers for communication, explanations of the behavioral and societal effects of CMC have become more important research topics (Kiesler, et al., 1984). One explanation is the Task-Oriented Model, which is comprised of three theories: the Social Presence Theory, Media/Information Richness Theory, and Social Context Cues Theory (also called the “Cues-Filtered-Out” model) (Culnan & Markus, 1987; Bellamy & Hanewicz, 1999), is a noted perspective. According to this model, FTF conversations include social cues (both verbal and nonverbal) and information that conveys emotions, whereas CMC has a significantly lesser amount of social information, in that the cues can only be verbal in nature. As a result, CMC tends to be inherently task-oriented, and may lack emotional content in communication (Bellamy & Hanewicz, 1999).

Research has also documented an increased amount of uninhibited behavior, such as “flaming,” or acting harshly or attack another individual while using a computer-mediated device (Siegel, Dubrovsky, Kiesler, & McGuire, 1986) and depersonalization, or a different, altered sense of one’s self (Kiesler, Zubrow, Moses, & Geller, 1985) from sender to receiver in the use of CMC communications. Another noted perspective is the Social-Emotion-Oriented Model, founded in the Social Information Processing Model (Walther, 1992b). According to this model, individuals engaged in CMC adapt their communication to the presentation and solicitation of socially-revealing and relational behavior. Specifically, the model details that CMC can facilitate social-emotional content exchange (Liu, 2002). This adaptation of behavior is also captured by an
additional noted perspective—Shott’s Social Control Theory (Shott, 1979), which states that emotive actions are influenced by situational definitions and social norms. That is, individuals may be motivated to adjust their behavior if they label the emotions aroused as negative or non-adaptive to the social environment (Turner, 1987). But computer-mediated technology, while clearly convenient and widely-used by many individuals, often cannot convey task-related, social-emotion-related, or socially-controlled information as quickly as in FTF conversations (Liu, 2002). This comparative timelag and lack of an availability of social cues in CMC separates it from that of FTF conversations.

The Task-Oriented Model, the Social-Emotion-Oriented Model, and Shott’s Social Control Theory—assist in describing the increased level of uninhibited behavior and depersonalization in CMC (Kiesler, et al., 1985; Siegel, et al., 1986). Yet, no instrument has been created to measure the degree to which factors such as disinhibition of behavior and depersonalization—along with others—occur in the context of CMC, as compared to FTF conversations, to create an “insulated” surrounding while using technology. The purpose of this project is to construct and use a scale to identify and examine “technological insularity,” defined as a psychological condition associated with technology-mediated communication in which the communicator is more isolated from and less mindful of the recipients or intended audience when engaged in CMCs than when engaged in FTF conversations, among individuals using technology-mediated devices.

It is noted here that the construct “technological insularity” is one that is founded on present research’s concept of “psychological distance.” While the term
“psychological distance” examines the impact of a composer’s sense of a recipient or “other” in the communication, including decreased inhibitions and unclear boundaries (Sumner & Hostetler, 2002), a precise definition of the term could not found in current literature. Thus, the process of reaching a clear conceptualization of the target construct, generation of a sufficient item pool, and generation of a scale to be administered to a heterogeneous sample, required significant effort by research members in this project, and will be described.

Noted as a primary step in scale development, Clark and Watson (1995) state that it is first necessary to possess a clear conceptualization of the target construct. This objective proved to be especially difficult for the project’s research members, given that the definitions of the seemingly similar construct of “psychological distance” currently available (e.g., Sumner & Hostetler, 2002) lack specificity and often focus on the cause or effect of the construct, without providing an operationalized definition. Clark and Watson (1995) suggest that the content of the initial item pool, while worded carefully, be overinclusive, and thus initial versions of a scale often include more items than the successive versions. Comrey (1988) notes that, if the items created are intended to measure the same construct, and if they are sufficiently related to each other, as can be demonstrated by the completion of factor analysis after the items have been written and tested on a sample, an adequate scale may be formed. Clark and Watson (1995) echo the latter sentiment, recommending that the goal of unidimensionality, rather than internal consistency, be sought, meaning that almost all interitem correlations be moderate in magnitude. Clark and Watson (1995) also note that the utilization of a heterogeneous sample, representing a range of a population, is preferred, assuming that construct does
not vary significantly based on specific demographic factors. The current project attempts to utilize both factor unidimensionality and a moderately heterogeneous in the creation and application of the TIS.

Hypotheses

*Correlation of Email Usage to Gender.* Research has noted behavioral differences between the genders in CMC. For example, research has suggested that females use language “hedges,” (Wallace, 1999) such as “Perhaps” or “It seems to me that,” and send more challenges and “flames” (defined as harsh online criticism, often peripheral to the original message’s intended focus) to others (Herring, 1996; Witmer & Katzman, 1997), compared to males (Wallace, 1999). While the results are interesting in their own right, it was decided that there was no strong justification for making precise predictions of gender differences during this early stage of development of the TIS scale. However, quantitative analyses will examine if any behavioral difference between the two genders were significant in the sample.

*Correlation of Technological Insularity Scale with Social Desirability Scale.* The research-documented findings that individuals may seek to create a favorable impression of themselves for others highlights the possibility that social desirability could play a role if participants are seeking to create a particular impression while completing the TIS, without the scale’s creators even realizing it if the issue is not considered. By inclusion of a social desirability scale as a subsequent comparison measure to the TIS, it may be determined whether respondents are answering the items in an accurate way according to their own thoughts and actions, or if they are attempting to make a particular impression,
be it a positive or negative one. A lack of a statistically significant correlation of social desirability items with TIS items was expected for two reasons. First, while research has noted that socially desirable responding (SDR) can occur in response to a variety of different circumstances in which one seeks to make oneself look a particular way, the project’s design is constructed so that respondents’ identities remain confidential, and they receive recognition for participation regardless of their responses. Thus, the motivation lies in the completion of the research offering, rather than the way in which is responded to by a participant. Second, for many TIS items, there is not a strongly socially-desirable response direction. That is, the way in which one can respond in order to “look good” or “look bad” is not necessarily clear in the scale items. Thus, it is expected that the relation of the social desirability scale to the TIS will be nonsignificant.

Correlation of Technological Insularity Scale with Empathy Scale. The construct of empathy implies mindfulness, rather than a technological insularity construct’s self-centeredness, in interactions with others. It was believed that the opposing nature of these constructs would be manifested by a negative correlation between empathy and technological insularity in the current project. Yet, as with the subsequently-described social isolation scale, a prediction that the negative correlation would necessarily be a very high one at this stage of the scale’s development was judged to be premature. It was believed that one could also argue that a flame might be performed in part because a sender knows that a particular message will upset a receiver. This effect demonstrates that the sender has empathy, or a type of “sensitivity to others’ pain and suffering” (Bartholow, Sestir, & Davis, 2005; Funk, Bechtoldt, Baldacci, Pasold, & Baumgardner, 2004), in order to realize the effect that the flame would have on the other person, and to
carry out the flame accordingly. However, it was not thought that this argument could be made for the majority of individuals judged as high in technological insularity, and therefore, the correlation would still remain negative in direction. Thus, it was expected that there would be a moderate negative correlation between technological insularity and empathy, using the classification that a correlation of $r = 0.5$ or above is judged to be large, $r = 0.3$ is moderate, and $r = 0.1$ is small (Cohen, 1988).

**Correlation of Technological Insularity Scale with Social Isolation Scale.** Social isolation can be defined as the “loss of social connection to other individuals and social institutions” (Elliot, Cunningham, Linder, Colangelo, and Gross, 2005). Because of a closeness of the social isolation and technological insularity constructs, a positive correlation was expected. Yet, as with the previous construct, a prediction that the correlation would necessarily be very high should be avoided. Research has documented that socially-isolated individuals do not have friendship networks, nor do they participate in the activities connected with social institutions (Elliot, et al., 2005); yet, arguably, friendship networks may be purely computer-mediated ones. That is, it can be argued that individuals who are high in technological insularity may not be socially connected to others in FTF conversations, but can be very connected to individuals by means of CMCs. Yet, this circumstance is not likely to be the case in relation to all individuals high in technological insularity, who can also very readily be individuals who are not socially connected in FTF or CMCs. Thus, it was expected that there would be a moderate positive correlation between technological insularity and social isolation, using the classification that a correlation of $r = 0.5$ or above is large, $r = 0.3$ is moderate, and $r = 0.1$ is small (Cohen, 1988).
Exploratory Factor Analysis (EFA): The Structure of the Scale. In the systematic construction of the scale by the research members and examination of current research in the field, seven factors were identified as contributors to the technological insularity construct. The seven factors are: informality, sensitivity, regulation, disclosure (openness), emotionality, anonymity (depersonalization), and homogeneity. It was expected that a significant amount of the variability among participants would be accounted for by the seven factors.

Purpose

Our purpose was to develop and implement the use of a measure of technological insularity that is grounded in the research areas of psychology, communications, and technology, the “Technological Insularity Scale,” or “TIS.” First, quantitative analyses, including tests of correlations and analysis of variance (ANOVA), were performed to detect and examine statistically-significant differences between variables including instrument scores, age, gender, and weekly computer usage. Second, factor analysis was used to make refinements of the scale, and to assess its factor structure. Three additional scales were completed by participants to test the scale’s construct validity, and demographic information, including participant age, gender, and computer usage was gathered.
METHOD

Participants in the Pilot Sample

The TIS items created and agreed upon as adequately reflecting the definition of the target construct were piloted on a small sample of undergraduates \((n = 13)\) and adults who already possessed their college degrees \((n = 15)\) demographically similar to the experimental sample in order to obtain opinions regarding aspects of clarity, conciseness, and logic of the items. TIS items were generated with the goal of assessing behavior and personal feelings, rather than cognitive social or value judgments. Therefore, the item “I am more likely to use the correct rules of language in a conversation than in an email” was preferred and used instead of the potential item “It is important to use the correct rules of language in a conversation than in an email.” Items were rewritten by the research team throughout multiple rounds of evaluation.

An informed consent was also provided to pilot participants (Appendix A). Responses from participants in the pilot sample resulted in subsequent minor wording changes that were insignificant in content, but were believed to aid in the clarity to the instrument, while still maintaining item integrity.\(^1\) Following the procedure conducted

\(^1\) The two categories of revisions were (a) elimination of potentially unnecessary words and phrases (e.g., “that I feel that”) and (b) addition of context to terms not necessarily well-known (e.g., “flame”) to add greater clarity to items.
with the pilot sample, the resulting form of the TIS was evaluated by research members, and profile characteristics of individuals high and low in the defined construct of technological insularity, based upon variables named in research’s examination of psychological distance (Kraut, et al., 1982; Kiesler, et al.,1984; Kiesler & Sproull, 1992; Joinson, 1999; Postmes, Spears, Sakhel, & De Groot, 1999; Dietz-Uhler & Bishop-Clark, 2003; Davis, 2002) were created (Appendix B), and consensus regarding the items was reached. The resulting items represented the final version of the TIS items that were viewed by participants (Appendix C). The seven factors, including sensitivity, regulation, informality, disclosure (openness) emotionality, anonymity, and homogeneity, were hypothesized to load on five respective items each (Appendix D).

Participants in the Study Sample

The sample (n = 494) included undergraduate students from sections of introductory psychology courses and mid-level psychology courses at a mid-sized Midwestern university and adults who had earned a college degree and were currently working at a full-time position. Undergraduates received course credit for their participation, while the adults submitted data on a voluntary basis. Nine participants, representing less than 2% of the sample, submitted incomplete data. For 7 of the 9 participants, it appears there was a computer malfunction or a termination of participation, as only a very small proportion of responses to early items were obtained. These participants’ responses were removed from the sample, resulting in a sample of total sample size of 487 participants.
The resulting sample contained 277 females and 210 males. Three-hundred nineteen participants were males, and 168 were adults. The undergraduates in the sample ranged in age from 18 to 25, with a mean age of 20 and a modal age of 19. The adults in the sample ranged in age from 23 to 75, with a mean age of 42 and a mode age of 30.

The sample size allowed for greater than 13.9 participants per TIS item, and was sufficient for factor analysis (Tinsley & Tinsley, 1987). As with the pilot sample, informed consent was provided to all of the study’s participants before the presentation of the items, in accordance with American Psychological Association (APA) policies, and all participants had the opportunity to discontinue their participation in the study at any time.

**Measures**

*Technological Insularity.* Technological insularity, as described by the TIS factors, includes judging technology use as high in informality, low in sensitivity, low in regulation, high in disclosure or openness, high in emotionality, high in anonymity (depersonalization), and high in homogeneity (Appendix B). Each of the 35 items on the TIS is evaluated on a Likert-type scale ranging from 1 (“Strongly Disagree”) to 6 (“Strongly Agree”). Items are scored such that higher scores indicate higher technological insularity. There are no reverse-scored items in the TIS. The total score on the 35-item instrument ranges from 35 to 210.

*General Goal of Three Validity Measures.* The process of creating a scale to measure technological insularity necessitates comparisons of the scale’s construct with additional constructs to test the validity and association of the scale’s construct with other
constructs established in the literature. The inclusion of three additional scales judged to be relevant to the technological insularity construct, and the correlation of each of the additional constructs with the technological insularity construct was investigated by research members. The relevance and expected relation of the three additional scale constructs—Marlowe-Crowne Social Desirability Scale, the Empathy Scale, and the social isolation subscale of Dean’s Powerlessness Scale—to the technological insularity construct is briefly detailed below.

**Social Desirability.** A “response bias” is an issue found in psychological assessments in which there is a systematic tendency to respond to a range of questionnaire items on a basis other than the item content, or what the items were designed to measure (Paulhus, 1991). Socially desirable responding is a type of response bias that has been most frequently studied in research, and denotes the tendency for a respondent to provide responses that makes the respondent look good (Paulhus, 1991). This tendency to create a positive impression is manifested especially when respondents are highly motivated to achieve some goal, such as motivation to create a favorable impression or to deny negative elements of their personality (Fox & Schwartz, 2002). Self-report measures may be so heavily influenced by response sets in that they may not provide a valid picture of the respondents’ present psychological status or condition.

The Marlowe-Crowne Social Desirability Scale (Appendix F; Crowne & Marlowe, 1964; MCSD) is a 33-item (18 items keyed in the true direction, 15 items keyed in the false direction) instrument, including items such as “I’m always willing to admit when I make a mistake” in a “True-False” format. Scores range from 0 to 33, with
higher scores representing the need for approval. The scale was included in order to measure response bias.

*Empathy.* Empathy, defined by research as “sensitivity to others’ pain and suffering” (Bartholow, et al., 2005; Funk, et al., 2004), implies a recognition of “putting oneself in another’s shoes” with respect to their felt emotions. Yet, as we have defined technological insularity as individuals being “less mindful of the recipients or intended audience,” the constructs appear to be antonyms. Research investigating the impact of other forms of technology, such as video games, upon participants’ capacity for and expression of prosocial behavior and attitudes, such as empathy (Bartholow, et al., 2005) has concluded that the forms may cause a decrease in level of empathy experienced by individuals. Furthermore, research has suggested that technology/technological media might create a desensitizing effect, resulting in a reduction in empathy, and that a link between low levels of empathy and risk for increased aggression (Miller & Eisenberg, 1988) should be examined.

The Empathy Scale (Appendix G; Caruso & Mayer, 1998) is a multi-dimensional, 30-item scale that measures emotional aspects of empathy and can be used by researchers interested in a general measure of emotional empathy as well as providing detailed sub-scales. To score, the 6 reverse-keyed items are reverse-scored; then the sum is calculated, and the sum is divided by 30 to obtain the total score. The mean of these sub-scales compute a “general empathy scale.” The Empathy Scale has strong psychometric qualities, and the administration and scoring of the scale is straightforward. The scale’s alpha reliability for the total 30-item scale scores is .88 ($\mu = 3.63$, $\sigma = 0.57$). The first factor-based scale, “Empathic Suffering,” consists of 8 items ($\mu=3.97$, $\sigma = .71$, $\alpha = .80$).
Factor scale two, “Positive Sharing,” includes 5 items ($\mu = 3.82$, $\sigma = .83$, $\alpha = .71$). Factor scale three, “Responsive Crying,” has 3 items ($\mu = 3.10$, $\sigma = 1.16$, $\alpha = .72$). Factor scale four, “Emotional Attention,” has 4 items ($\mu = 3.68$, $\sigma = .90$, $\alpha = .63$). Factor scale five, “Feeling for Others,” has 3 items with pattern/structure coefficients of .45 or greater, and one with a pattern/structure coefficient of .43 which was included in the scale since its content was so similar to the other 3 items ($\mu = 3.10$, $\sigma = .79$, $\alpha = .59$). The last factor scale, “Emotional Contagion,” has two items ($\mu = 3.40$, $\sigma = .91$, $\alpha = .44$), including items 11, “When I’m with other people who are laughing I join in,” and item 17, “If a crowd gets excited about something so do I.” A General Empathy scale, consisting of the 26 items of the six factor scales, has a mean of 3.53 ($\sigma = .60$) and an alpha reliability of .86.

**Social Isolation.** Social isolation was measured by the social isolation subscale of Dean’s Powerlessness Scale (Appendix H; Dean, 1961). The 9 items are presented in five-point Likert format, with answer alternatives ranging from 4 (Strongly Agree) to 0 (Strongly Disagree); five of the items are reverse-scored. Scale scores can vary from 0 (signifying lowest social isolation) to 36 (signifying highest social isolation). One item that is included in the scale is, “I don’t get invited out by friends as often as I’d really like.”

The relevance of the addition of a social isolation scale is explained by the comparison of the scale’s construct to the technological insularity construct. As previously mentioned, technological insularity has notable associations to the definition of the construct of social isolation, which is defined by researchers as the “loss of social connection to other individuals and social institutions” (Elliot, et al., 2005).
Technological insularity can therefore be viewed as a type of online/electronically-mediated social isolation. The reliability of the social isolation subscale, tested by the split-half method and corrected by the Spearman-Brown formula, was .84.

Procedure

Creation of the TIS scale items. Due to a lack of a working construct definition of technological insularity in research, literature in the fields of psychology, communications, and technology were examined to explore similarly-themed constructs. In addition, existing instruments measuring related constructs, including empathy, social isolation, self-consciousness, self-awareness, and self-esteem, as described above, were reviewed and included in the project. A construct-specific definition of technological insularity, using existing literature on related constructs, such as “psychological distance,” as a theoretical foundation, was developed. Decisions regarding the breadth of the construct were made by a research group composed two research team psychology professors and a counseling psychology graduate student. The research members also created and refined the instrument’s items, the scaling of the items, the instructions for the scale, and the formatting of the instrument.

A rating form, which included the working construct definition, a short summary of how the items were drafted up to that time, the instrument’s format and intended population, and the ratings that were requested of them for each of the items, was provided to each of the raters. Specifically, the raters were asked to provide ratings of three dimensions for each item: comprehension/clarity, the relationship of each item to the construct, and qualitative comments regarding any aspect of any of the items. After
this procedure, the ratings were judged, and the construct definition and the items were again revised.

Finally, the items were again revised through in-person and e-mail-based evaluations of each of the items by the research team psychology professors and the one counseling psychology graduate student. There were approximately ten rounds of evaluations in total. After multiple rounds of evaluation in this format, the research members met collectively to refine the scale items. The penultimate version of the TIS was then administered to an appropriate pilot sample with similar demographic information to the experimental sample. Specifically, the length of time required to complete the instrument was noted, the cognitive and emotional reactions to the instrument were solicited and recorded, and general instrument and specific item feedback were solicited from the pilot sample. The pilot samples’ responses were evaluated and consensus among the research team regarding the TIS items was reached. Following this, the 35-item TIS was then posted on SurveyMonkey.com, along with the three additional comparison scales and demographics questions, and was available for use by the experimental sample.

In devising the TIS, seven major factors contributing to the technological insularity construct were categorized by the research members.² The detailed descriptions of the factors are as follows:

1. **Informality** is defined as, when conversing or emailing, one’s degree of attention/inattention to linguistic formalities like sentence structure, grammar, syntax, etc.

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² A prior study (n = 141 undergraduates) was carried out to obtain opinions regarding the certain aspects of technological insularity, thereby being an antecedent to the general process of scale development. Along with research from the fields of psychology, communications, and technology, the study contributed to the development of the seven listed factors and the TIS.
2. **Sensitivity** is conceptualized as the extent to which a communicator is/is not cognizant during conversation or email of the potential impact of what is being said to the recipient(s).

3. **Regulation** is conceptualized as the extent to which content, form, or affective characteristics of a conversation or email are tailored based on actual, anticipated, or imagined characteristics of the recipient(s).

4. **Disclosure (openness)** is defined as the extent to which communicators are/are not willing to disclose personal or private information in conversations or emails; the extent to which openness and honesty of expression does/does not characterize those communications.

5. **Emotionality** is conceptualized as the willingness of communicators to disclose personal or private information in conversations or emails; the extent to which openness and honesty of expression characterizes those communications.

6. **Anonymity (depersonalization)** is defined as the degree to which conversations or emails are felt to be impersonal or private.

7. **Homogeneity** is conceptualized as the extent to which the form or content of conversations or emails are differentiated by the communicator based on the status or position of the recipient(s).
RESULTS

Sample Characteristics

In the overall sample, 56.88% of the participants were women \((n = 277)\) and 43.12% were men \((n = 210)\); the average age of participants was 29.04, and the age ranged from 18 to 75 years of age. No information regarding ethnic or racial identity was requested from participants for this study. Although academic majors or professional fields were requested from and reported by participants, these data will not be used for the present project.

Participant Analysis. TIS items were modified through multiple rounds of evaluation and feedback by expert raters, and there was a subsequent administration to the sample of undergraduate and post-graduate adults. However, it was noted that the sample differed in age (undergraduate and post-undergraduate adults), age, and weekly experience with a computer. The issue that one or all of these demographic variables may interact with the construct under investigation was deemed to be worthy of examination by research members. For example, perhaps post-undergraduate individuals do not have the same technological insularity as younger people, possibly because of differential experience with technology as a mediating factor. If any of these variables were determined to be different, then an analysis of variance (ANOVA) would need to be
performed to determine the mean for each of these subgroups within the particular variable, and to determine if the mean difference was statistically significant.

Reliability and Validity of the TIS. For the entire sample ($n = 487$), scores on the TIS included the entire instrument scale, and ranged from 1 (Strongly Disagree) to 6 (Strongly Agree), with a mean of 123.37 ($\sigma = 23.05$). It is noted here that while clear significant relationships of the technological insularity construct with empathy and social isolation were not demonstrated in this study, statistical relationships approaching significance were found, and additional research into the relationship of technological insularity with these and other constructs will be helpful in the future. Nevertheless, the lack of a significant relationship between the TIS and the Marlowe-Crowne Social Desirability scale demonstrate that participants did not manifest a need for approval by their responses. Finally, given the early stages of the scale’s development and the lack of conclusions about who these groups are or how each behaves, the TIS’s ability to differentiate between groups believed to vary in their levels of technological insularity was still judged to be limited at this time.

Internal Consistency of the TIS. Internal reliability estimates revealed very strong internal consistency within the TIS. Coefficient, or Cronbach’s, $\alpha$ for the TIS was .96. For comparison purposes, we note that the commonly-used Marlowe-Crowne Social Desirability ranged from .73 to .88, the Empathy Scale reported an alpha of .86, and the Social Isolation subscale reported an alpha of .84.

Construct Validity of the TIS. With regard to the construct validity of the TIS, relationships of technological insularity with other constructs proposed to be related to the construct, including empathy and social isolation, were demonstrated, but, again,
these relationships did not presently reach the levels of statistical significance. To improve upon the construct validity of the TIS, additional comparisons of the technological insularity construct with other defined constructs, such as public and private self-consciousness, self-worth, perception of self, and self-esteem, and hypothesized relationships between these constructs, should be pursued in future research.

*Discriminant Validity of the TIS.* According to Campbell and Fiske (1959), discriminant validity is indicated by a lack of correspondence or association between a measure and variables that should be unrelated to that measure. The TIS was originally constructed to be a measure applicable to both men and women. The results of this study do in fact demonstrate in the sample that there was no significant difference between average TIS scores for men of 3.70 and average TIS scores for women of 3.43. Thus, based on the resulting data in this project, average TIS scores remain in the middle of the scale’s range for both genders, even in the finding that men reported being significantly more technologically insular.

*Age and TIS Scale Scores.* Pearson correlation coefficients for each of the variables included in the project were calculated. There was no difference in how undergraduates and post-undergraduates responded to the TIS ($F(1,485) = .04, p = .85$). Therefore, these groups were combined for all subsequent analyses.

*Age and Marlowe-Crowne Social Desirability Scale Scores.* There was a significant difference between the responses of undergraduates and post-graduates responded to the Marlowe-Crowne Social Desirability Scale, ($F(1,485) = -.09, p = .05$), with post-undergraduates showing a higher mean score ($\mu = 15.51$) than undergraduates.
Yet, this pattern of results is supported by results found from 650 Peace Corps volunteers by Fisher (1993), which included increased mean scores ($\mu = 16.10$ for males, and $\mu = 16.40$ for females, respectively) as compared to the mean scores reported by Crowne and Marlowe’s (1964) sample of 300 college students.

**Gender and TIS Scale Scores.** A significant difference between gender and TIS scores was found in the sample ($F(1,487) = -.17, p = .0002$). Specifically, males were found to be more technologically insulated than their female counterparts. Although a specific prediction regarding gender and TIS scores was not made prior to the study, the result parallels the pattern of the significant difference between gender and weekly computer experience, noted below.

**Gender and Weekly Computer Experience.** A significant difference between gender and weekly computer experience was found in the sample ($F(1,485) = .27, p < .0001$). Specifically, females reported more weekly computer usage than their male counterparts. This finding is a bit surprising, given that males reported a comparatively higher level of technological insularity on the TIS than their female counterparts. The particular tasks for which females and males respectively use their computers on a typical week should be examined in future research, in order to determine if the ways in which computers are used, rather than mere computer experience, is a worthwhile consideration.

**Gender and Marlowe Crowne Social Desirability Scale Scores.** A significant difference between gender and Marlowe-Crowne Social Desirability scale scores was found in the sample ($F(1,487) = .10, p = .02$). Specifically, the scale’s responses from the females were found to be representative of a higher need for approval than their male counterparts. The result reflects previously-found higher reported means on the MCSD
scale for females than for males, respectively (Tanaka-Matsumi & Kameoka, 1986), in the literature.

*Weekly Computer Experience and TIS Scores.* In regard to weekly computer experience and TIS scores, a statistically significant difference was found \( F(1,485) = -.18, p < .0001 \). Specifically, participants who report high scores of technological insularity are those individuals who also report relatively low levels of weekly computer experience.

*Weekly Computer Experience and Dean Powerlessness Social Isolation Subscale Scores.* In regard to the Social Isolation subscale of the Dean Powerlessness Scale, a statistically significant difference was found between participants’ scale score and their self-reported weekly computer experience, \( F(1,485) = -.11, p = .02 \). Specifically, participants who used the computer more often during a typical week reported higher levels of social isolation. No other significant findings were found in the analyses.

*The TIS, Empathy Scale, and Dean Powerlessness Social Isolation Subscale Scores: Approaching statistical significance.* Two results were close to and approaching statistical significance, but were not found to be significant at the .05 level. However, their respective values are worth briefly noting here.

*The TIS and Empathy Scale Scores.* A positive relationship between TIS and Empathy scale scores were approaching, but not at a conventional level of statistical significance \( F(1,485) = .08, p = .09 \). Further examination into the relationship between the constructs of technological insularity and empathy and efforts to replicate this finding are a worthwhile topic of study in this area. Whether this pattern of findings is supportive of a moderate correlation between the two constructs over a number of studies
is not yet answerable. Nevertheless, due to the lack of conventional statistical significance, a further comparison between these variables will not be included here.

*The TIS and the Dean Powerlessness social isolation subscale scores.* A positive relationship between TIS and the social isolation subscale scores was approaching, but did not reach a conventional level of statistical significance \(F(1,485) = -0.07, p = 0.10\). Here too, further examination into the relationship between the constructs of technological insularity and social isolation and efforts to replicate this finding are a worthwhile topic of study in this area. Additional research supportive, and ideally statistically significant, of this pattern of results may demonstrate positive, rather than negative, potential aspects of technological insularity.

*TIS Item Analysis.* Following the modification of items through the feedback and revisions of expert raters, as previously noted, and subsequent administration of the items, an item analysis of the item pool was conducted. Following in practice with earlier research (Corning, 2000; Corning & Myers, 2002), items were eliminated if their item-total correlations were less than .30. Using this as a criterion, 7 of the 35 items given to participants were removed to create a newer and more cohesive 28-item of the TIS scale.

*Factor Structure of the 28-Item TIS Scale.* Principal axis factoring, with iterations and oblique rotation, in order to explore the factor structure of the TIS, was implemented. Retention of four factors was based on the results of a scree test (Cattell, 1966)

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3 Preacher and MacCallum (2003) noted that the criterion of retaining as many factors as there are eigenvalues of the unreduced sample correlation matrix greater than 1.0, known variously as the Kaiser criterion, the Kaiser–Guttman rule, the eigenvalue-one criterion, truncated principal components, or the K1 rule, is inferior to an examination of the scree plot (Cattell, 1966; Gorsuch, 1990). Research has demonstrated that examination and interpretation of the scree plot results in an accurate determination of the number of factors in the majority of examinations (Cattell & Vogelmann, 1977).
combination with examination of an alternative factor solution, as recommended by Floyd and Widaman (1995). The factor loading matrix is presented with the item content in Table 1. The use of oblique rotation is especially supported by the post hoc correlation of .53 between factors 1 and 2, .37 between factors 2 and 3, and .56 between factors 3 and 4.

Following the procedure of Corning (2000) and Corning and Myers (2002), the common practice of using the criterion of “greater than or equal to .30” as a means of categorizing ambiguous and moderately-loading items as “high” and all others as “low” was implemented in this study’s analysis. Also in keeping with this procedure, examination of the loading pattern of an item across each of the factors, with items that have moderately lower loadings, but clearly and substantially load one particular factor, as compared to all other factors, may be considered to be loading on that one factor (Gorsuch, 1990). Once again, given these guidelines, it was determined that 7 of the 35 items posed to participants loaded ambiguously (noted on Table 1 by an *), resulting in their elimination. Factor 1 accounted for 15.23% of the variance in the measured variables, factor 2 accounted for 1.79% of the variance in the measured variables, factor 3 accounted for 1.44% of the variance in the measured variables, and factor 4 accounted for .77% of the variance in the measured variables.

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4 As an aside, in comparing the four-factor model to the three-factor model, as is recommended by Floyd and Widaman (1995), and is supported by examination of the eigenvalues, the three-factor model resulted in more than twice the number of ambiguously-loading items, as compared to the four-factor model.
DISCUSSION

The definition and examination of technological insularity is an evolving process of study that requires research- and theory-based examination. Given technology’s increasing availability, (Bellamy & Hanewicz, 1999), the study into the causes, effects, and correlations of technological insularity, both adaptive and maladaptive in nature, the examination becomes more important. However, existing research (Sumner & Hostetler, 2002) lacks an operationalized definition of the construct, along with little specificity or focus on the components comprising the construct. Along with this lack of agreement in the denotation of the construct is inadequate assessment of the construct, resulting in a further fragmentation of the existing literature.

While there is some support for an insulating effect of technologically-mediated communication, as compared to FTF communication, not all individuals will manifest the same level of technological insularity in their technologically-mediated communications, and thus a range of potential responses or perceptions is needed in an instrument. However, given the potential differing levels of technological insularity, it is also important that respondents to the instrument do not simply select a “happy medium” in response to the items, whether it is an attempt to present themselves in a certain way or as an attempt to avoid taking a particular stance or side. Therefore, an instrument that does
not include a middle point is needed to extend research into the study of technological
ingularity in current society.

This study’s definition of technological insularity, defined as a psychological
construct associated with technology-mediated communication in which the
communicator is more isolated from and less mindful of the recipient or intended
audience when composing email messages than when engaged in conversation, is not
considered a complete definition of the construct at this early stage of construct definition
and scale development. Yet, as suggested by Clark and Watson (1995), a clear
conceptualization of the target construct was reached prior to the final evaluation of the
TIS items and administration of the items to participants. This project marks a step
towards a reintegration and extension of existing literature in the area by the creation of a
theoretically-grounded, psychometrically-sound scale that assesses individuals’ levels of
technological insularity.

The range of the Technological Insularity Scale appears to have captured the
varying levels of the construct within a heterogeneous sample, and appears to avoid
unilaterally evoking individuals’ attempts to “fake good” or “fake bad” in order to be
socially desirable or undesirable. Previous research has shown that electronically-based
surveys were less likely to cast respondents in a favorable light, thereby showing a lack
of an exaggeration of good behavior (Sproull and Kiesler, 1991). However, significant
differences, in that both females, compared to their male counterparts, and that post-
undergraduates, compared to their undergraduate counterparts, were found to be
representative of a higher need for approval, were found. Given that this pattern of
results is supported by the results of existing research (Fisher, 1993), it is not a surprising
one. Yet, further examination into the differing levels of need for acceptance in individuals with heterogeneous demographic characteristics is recommended. The high alpha of the scale demonstrates excellent external consistency, even when the TIS is compared to other widely-used instruments, such as the Marlowe-Crowne (Crowne & Marlowe, 1964). The TIS was developed with the use of classical procedures for test construction (Comrey, 1988; Clark and Watson, 1995), and was grounded in theory and empirical work from the fields of psychology, communications, and technology.

While the resultant factor structure yielded four, rather than the previously-projected seven, factors in the model, the clear item loadings on each of the four factors showed that the resultant four-factor model is strongly supported by the obtained data. In addition, the factors of formality, Connectedness/Responsiveness, Focus on Self and Personal Information, and Emotional Flexibility/Lack of Constraints (Appendix E) do not significantly deviate from the study’s previously-projected structure or existent literature. While it was determined that the elimination of seven of the original thirty-five items was not a significant deduction, it could be argued that the number of eliminated items in the four-factor model might suggest a different factor structure. Specifically, Schmid and Leiman’s (1957) hierarchical factor structures, in which many items loaded on a common secondary factor while different clusters of items loaded on specific independent primary factors, may be an alternative consideration worth pursuing in the future, if the items eliminations are considered by future researchers to be significant. Since this was presently judged not to be the case, these analyses have not been performed here.

One additional aspect that this study’s results have highlighted is that technological insularity does not necessarily carry a negative impact. In fact, given that
participants who reported high scores of technological insularity also reported relatively low levels of weekly computer usage, it appears that technological insularity is not necessarily based on actual computer usage. Perhaps, instead, the activities for which the computer is used is more indicative of individuals’ levels of technological insularity. However, participants who used the computer more often during a typical week did report higher levels of social isolation. This finding highlights a difference between technological insularity and social isolation—these data show that these constructs were not synonymous with each other. While a positive relation between TIS and the social isolation subscale scores were approaching, it was not at a conventional level of statistical significance. Finally, the one other finding that approached, but did not reach, statistical significance that is again worth noting here is the positive relation between TIS and Empathy scale scores. Further examination into the relation between the constructs of technological insularity and empathy and efforts to replicate this finding are a worthwhile topic of study in this area. The potential positive characteristic of empathy as related to technological insularity is a topic worth examining in future studies.

Evidence for reliability of the scale will need to be further assessed in the future by administration of the TIS to additional samples including participants with a range of demographic characteristics. In addition, evidence for the scale’s construct and discriminant validity may be improved upon by the finding of significant positive and negative, respectfully, relationships between technological insularity and other constructs with which there is believed to be the presence of absence of correspondence. However, the validity evidence is strongly supportive of the TIS, given its high level of internal consistency. Further study into the scale’s predictive validity between level of
technological insularity and measurement of future behavior, which was not directly
examined here, would provide even more support for the use of the scale in future
research, and is recommended as a future direction for research.
TABLE 1

ITEMS AND FACTOR LOADINGS OF THE TECHNOLOGICAL INSULARITY SCALE (TIS)

<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am more likely to use the correct rules of language in a conversation than in an email.</td>
<td>0.75</td>
<td>0.00</td>
<td>0.06</td>
<td>-0.16</td>
</tr>
<tr>
<td>I tend to watch my grammar less in emails than in conversations.</td>
<td>0.99</td>
<td>-0.03</td>
<td>-0.06</td>
<td>-0.07</td>
</tr>
<tr>
<td>I am less likely to be conscious of proper etiquette in emails than in conversations.</td>
<td>0.70</td>
<td>0.06</td>
<td>0.11</td>
<td>0.04</td>
</tr>
<tr>
<td>In a conversation, I pay more attention to the proper use of words than I do in an email.</td>
<td>0.79</td>
<td>0.00</td>
<td>0.08</td>
<td>0.01</td>
</tr>
<tr>
<td>I am less concerned about how I structure my sentences in an email than in a conversation.</td>
<td>0.89</td>
<td>0.01</td>
<td>-0.15</td>
<td>0.18</td>
</tr>
<tr>
<td>I am less formal in an email than in a conversation.</td>
<td>0.87</td>
<td>-0.03</td>
<td>0.02</td>
<td>-0.04</td>
</tr>
<tr>
<td>I am more responsive to others in a conversation than in an email.</td>
<td>0.02</td>
<td>0.66</td>
<td>0.07</td>
<td>-0.15</td>
</tr>
<tr>
<td>I prefer to say something nice to others in person rather than writing it to them in an email.</td>
<td>0.00</td>
<td>0.73</td>
<td>-0.07</td>
<td>-0.06</td>
</tr>
<tr>
<td>When writing an email, I have to take my emotional expression up a notch or two to achieve the same effect I would have in a conversation.</td>
<td>0.05</td>
<td>0.57</td>
<td>0.13</td>
<td>0.29</td>
</tr>
<tr>
<td>I never feel quite as personally connected to someone when writing an email as I do in a conversation.</td>
<td>-0.03</td>
<td>0.85</td>
<td>0.07</td>
<td>-0.18</td>
</tr>
<tr>
<td>When writing an email, I tend to think less about how other people will react to what I am saying than when I am talking to them.</td>
<td>0.07</td>
<td>-0.08</td>
<td>0.96</td>
<td>-0.24</td>
</tr>
<tr>
<td>In a conversation, I am more likely to adjust what I say based on who I am communicating with than I am using email.</td>
<td>-0.09</td>
<td>-0.03</td>
<td>0.81</td>
<td>-0.08</td>
</tr>
<tr>
<td>Item</td>
<td>Factor 1</td>
<td>Factor 2</td>
<td>Factor 3</td>
<td>Factor 4</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>I might say things to superiors (for example, professors or managers) in an email that I would not say to them in a conversation.</td>
<td>-0.14</td>
<td>-0.03</td>
<td>0.53</td>
<td>0.28</td>
</tr>
<tr>
<td>In a conversation, I am more likely to consider how what I say will be taken from the other person’s point of view than when I am writing an email.</td>
<td>-0.02</td>
<td>0.13</td>
<td>0.99</td>
<td>-0.13</td>
</tr>
<tr>
<td>I am less likely to pay attention to the tone of what I am saying in an email than when I am having a conversation.</td>
<td>-0.11</td>
<td>0.03</td>
<td>0.91</td>
<td>-0.08</td>
</tr>
<tr>
<td>I am less concerned about people taking things the wrong way when I write an email than when I have a conversation.</td>
<td>0.05</td>
<td>0.05</td>
<td>0.68</td>
<td>0.02</td>
</tr>
<tr>
<td>I spend less time thinking about how to respond to something I get in an email than I would if the same thing were said to me in person.</td>
<td>0.13</td>
<td>-0.02</td>
<td>0.52</td>
<td>0.16</td>
</tr>
<tr>
<td>I am less concerned about accidentally offending or hurting someone’s feelings in an email than I am when talking with them.</td>
<td>0.08</td>
<td>0.12</td>
<td>0.57</td>
<td>0.04</td>
</tr>
<tr>
<td>I need to be more careful about what I say to someone in person than in an email.</td>
<td>0.03</td>
<td>0.28</td>
<td>0.43</td>
<td>0.08</td>
</tr>
<tr>
<td>I am more likely to control or restrain my emotions in a conversation than in an email.</td>
<td>0.00</td>
<td>-0.08</td>
<td>0.25</td>
<td>0.52</td>
</tr>
<tr>
<td>I am more likely to “stretch the truth” about something in an email than I am in a conversation.</td>
<td>0.12</td>
<td>0.08</td>
<td>0.25</td>
<td>0.34</td>
</tr>
<tr>
<td>It’s easier to “go off” on someone in an email message than it is in a conversation.</td>
<td>-0.03</td>
<td>0.02</td>
<td>-0.25</td>
<td>0.89</td>
</tr>
<tr>
<td>I find it’s more difficult to talk about my true feelings and thoughts in conversations than it is in emails.</td>
<td>0.05</td>
<td>-0.12</td>
<td>-0.02</td>
<td>0.90</td>
</tr>
<tr>
<td>When I’m really upset with someone, I’d rather tell them in an email than in person.</td>
<td>0.02</td>
<td>-0.24</td>
<td>-0.08</td>
<td>0.95</td>
</tr>
<tr>
<td>When using email, I feel like I can take more liberties with what I say than I can in a conversation.</td>
<td>-0.02</td>
<td>-0.04</td>
<td>0.08</td>
<td>0.79</td>
</tr>
<tr>
<td>In an email, I find it’s easier to say something harsh or critical than it is to say the same thing in person.</td>
<td>-0.05</td>
<td>0.07</td>
<td>-0.15</td>
<td>0.93</td>
</tr>
<tr>
<td>I would “flame” (make an insulting or critical remark to) someone in an email before I would do it to their face.</td>
<td>0.00</td>
<td>0.03</td>
<td>-0.03</td>
<td>0.87</td>
</tr>
</tbody>
</table>

33
<table>
<thead>
<tr>
<th>Item</th>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>When I write an email, I feel much more like I am thinking to myself than I do when I am having a conversation with someone.*</td>
<td></td>
<td>-0.20</td>
<td>0.29</td>
<td>0.27</td>
<td>0.26</td>
</tr>
<tr>
<td>When I talk with someone, I have a greater sense that the conversation is public than I do when I am having email exchanges.*</td>
<td></td>
<td>-0.10</td>
<td>0.19</td>
<td>0.22</td>
<td>0.29</td>
</tr>
<tr>
<td>I am more likely to send an identical email to peers and superiors (for example, professors or managers) than I am to speak in person with them in an identical way.*</td>
<td></td>
<td>0.11</td>
<td>0.34</td>
<td>-0.06</td>
<td>0.30</td>
</tr>
<tr>
<td>When I write an email, I tend to focus more on what I want to say, rather than what the other person might want to say, than I do when I am having a conversation with someone.*</td>
<td></td>
<td>0.05</td>
<td>0.34</td>
<td>-0.17</td>
<td>0.46</td>
</tr>
<tr>
<td>In a conversation, I’m less likely to say things I’m unsure about than I am in an email.*</td>
<td></td>
<td>0.00</td>
<td>0.03</td>
<td>0.42</td>
<td>0.37</td>
</tr>
<tr>
<td>In an email, I am less likely to be mindful of the other person’s position or status than when talking with them.*</td>
<td></td>
<td>0.10</td>
<td>0.00</td>
<td>0.45</td>
<td>0.30</td>
</tr>
<tr>
<td>I am more reserved when conversing with superiors (for example, professors or managers) than when emailing them.*</td>
<td></td>
<td>0.02</td>
<td>0.27</td>
<td>0.30</td>
<td>0.21</td>
</tr>
</tbody>
</table>
APPENDIX A

PARTICIPANT INFORMED CONSENT

Informed Consent for Online Survey Regarding Attitudes Toward the Internet and the World Wide Web

This document provides informed consent information to research participants as required by the University of Notre Dame.

Research Procedures
This study is being conducted to gather data on attitudes and opinions. If you agree to participate, you will be asked to answer some questions, and the process should take approximately 30-40 minutes.

Risks
There are no foreseeable risks to you for participating or declining to participate in this survey.

Benefits
Although there are no direct benefits to you as a participant, greater benefit may eventually come from a better understanding of the research topic may result once the data are tabulated, summarized, and reported.

Confidentiality
All data collected in this study are confidential. You have agreed to provide your email address only for purposes of our follow up in relation to this survey. This follow up, if it occurs, will be to further explore with you either your answers or the subject matter of this survey.

Also, while it is understood that no computer transmission can be perfectly secure, reasonable efforts will be made to protect the confidentiality of your transmission.

Participation
Your responding to this survey is voluntary. Should you wish to participate, please proceed. Should you wish not to participate, please disregard this message. There will be no cost to you for participating or declining to participate. You may withdraw at any point, with no loss of benefits with Notre Dame.
Contact
This research is being conducted by several faculty and graduate students in the Department of Psychology at Notre Dame. Dr. Charles R. Crowell may be reached for questions regarding this research via telephone at 574.631.6660 or via email at ccrowell@nd.edu.

This research has been reviewed according to the University of Notre Dame procedures governing your participation.

Consent
Should you choose to participate, please proceed to the following page and complete all requested information, signaling to us and the University of Notre Dame that “I have read this form and agree to participate in this study.” Accessing the survey via the following pages is the equivalent of your signature. If you are not yet 18 years of age, the University requires that you arrange to provide us with a notice of parental consent (email is fine).
APPENDIX B

TIS PROFILE SUMMARIES

Profile listing of an individual who is **high in technological insularity**, as defined by the TIS.

**High** in the following factors:
- Informality
- Disclosure (Openness)
- Emotionality
- Anonymity
- Homogeneity

**Low** in the following factors:
- Sensitivity
- Regulation
Profile listing of an individual who is **low in technological insularity**, as defined by the TIS.

**High in the following factors:**

- Sensitivity
- Regulation

**Low in the following factors:**

- Informality
- Disclosure (Openness)
- Emotionality
- Anonymity
- Homogeneity
APPENDIX C

TIS ITEMS ADMINISTERED TO PARTICIPANTS

Participant Scale

Take a moment to think of your typical face-to-face conversations and how you behave. What are you like? How do you respond to others?

Now think of your typical email communication. How do you behave? How do you respond to others?

In the following survey, we'd like you to compare the way you behave in person with the way you behave when you use email.

Please answer all of the questions as honestly as possible. There are no correct or incorrect responses. The term “conversation” used below refers primarily to face-to-face conversations, although telephone conversations may apply as well. The term “email” used refers to standard asynchronous email programs (such as Eudora, Outlook, or Webmail).

After completion of this survey, you will be directed to a page that will ensure that you receive credit for your participation.

Thank you very much for your time and participation!

1. I am more likely to use the correct rules of language in a conversation than in an email.

1 Strongly Disagree 2 3 4 5 6 Strongly Agree
2. When writing an email, I tend to think less about how other people will react to what I am saying than when I am talking to them.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

3. In a conversation, I am more likely to adjust what I say based on who I am communicating with than I am using email.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

4. In a conversation, I am less likely to share personal information with someone I hardly know than in an email message.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

5. I am more likely to control or restrain my emotions in a conversation than in an email.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

6. When I write an email, I feel much more like I am thinking to myself than I do when I am having a conversation with someone.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

7. I might say things to superiors (for example, professors or managers) in an email that I would not say to them in a conversation.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

8. I tend to watch my grammar less in emails than in conversations.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree
9. In a conversation, I am more likely to consider how what I say will be taken from the other person’s point of view than when I am writing an email.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

10. I am less likely to pay attention to the tone of what I am saying in an email than when I am having a conversation.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

11. I am more likely to “stretch the truth” about something in an email than I am in a conversation.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

12. It’s easier to “go off” on someone in an email message than it is in a conversation.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

13. When I talk with someone, I have a greater sense that the conversation is public than I do when I am having email exchanges.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

14. I am less likely to be conscious of proper etiquette in emails than in conversations.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

15. In a conversation, I pay more attention to the proper use of words than I do in an email.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree
16. I am less concerned about people taking things the wrong way when I write an email than when I have a conversation.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

17. I am more responsive to others in a conversation than in an email.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

18. I find it’s more difficult to talk about my true feelings and thoughts in conversations than it is in emails.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

19. When I’m really upset with someone, I’d rather tell them in an email than in person.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

20. When using email, I feel like I can take more liberties with what I say than I can in a conversation.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

21. I am more likely to send an identical email to peers and superiors (for example, professors or managers) than I am to speak in person with them in an identical way.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

22. I am less concerned about how I structure my sentences in an email than in a conversation.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree
23. When I write an email, I tend to focus more on what I want to say, rather than what the other person might want to say, than I do when I am having a conversation with someone.

1 Strongly Disagree  2 3 4 5 6 Strongly Agree

24. I spend less time thinking about how to respond to something I get in an email than I would if the same thing were said to me in person.

1 Strongly Disagree  2 3 4 5 6 Strongly Agree

25. In an email, I find it’s easier to say something harsh or critical than it is to say the same thing in person.

1 Strongly Disagree  2 3 4 5 6 Strongly Agree

26. I would “flame” (make an insulting or critical remark to) someone in an email before I would do it to their face.

1 Strongly Disagree  2 3 4 5 6 Strongly Agree

27. In a conversation, I’m less likely to say things I’m unsure about than I am in an email.

1 Strongly Disagree  2 3 4 5 6 Strongly Agree

28. In an email, I am less likely to be mindful of the other person’s position or status than when talking with them.

1 Strongly Disagree  2 3 4 5 6 Strongly Agree

29. I am less formal in an email than in a conversation.

1 Strongly Disagree  2 3 4 5 6 Strongly Agree
30. I am less concerned about accidentally offending or hurting someone’s feelings in an email than I am when talking with them.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

31. I need to be more careful about what I say to someone in person than in an email.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

32. I prefer to say something nice to others in person rather than writing it to them in an email.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

33. When writing an email, I have to take my emotional expression up a notch or two to achieve the same effect I would have in a conversation.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

34. I never feel quite as personally connected to someone when writing an email as I do in a conversation.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree

35. I am more reserved when conversing with superiors (for example, professors or managers) than when emailing them.

1 Strongly Disagree  2  3  4  5  6 Strongly Agree
APPENDIX D

PROJECTED (PRE-FACTOR ANALYSIS) ITEM MAPPINGS: TECHNOLOGICAL INSULARITY SCALE (TIS)

I. Informality

Definition: When conversing or emailing, one’s degree of attention/inattention to linguistic formalities like sentence structure, grammar, syntax, etc.

1. I am more likely to use the correct rules of language in a conversation than in an email.
8. I tend to watch my grammar less in emails than in conversations.
15. In a conversation, I pay more attention to the proper use of words than I do in an email.
22. I am less concerned about how I structure my sentences in an email than in a conversation.
29. I am less formal in an email than in a conversation.

II. Sensitivity

Definition: The extent to which a communicator is/is not cognizant during conversation or email of the potential impact of what is being said on the recipient(s).
2. When writing an email, I tend to think less about how other people will react to what I am saying than when I am talking to them.

9. In a conversation, I am more likely to consider how what I say will be taken from the other person’s point of view than when I am writing an email.

16. I am less concerned about people taking things the wrong way when I write an email than when I have a conversation.

23. When I write an email, I tend to focus more on what I want to say, rather than what the other person might want to say, than I do when I am having a conversation with someone.

30. I am less concerned about accidentally offending or hurting someone’s feelings in an email than I am when talking with them.

III. Regulation

**Definition:** The extent to which content, form, or affective characteristics of a conversation or email are tailored based on actual, anticipated, or imagined characteristics of the recipient(s).

3. In a conversation, I am more likely to adjust what I say based on who I am communicating with than I am using email.

10. I am less likely to pay attention to the tone of what I am saying in an email than when I am having a conversation.

17. I am more responsive to others in a conversation than in an email.

24. I spend less time thinking about how to respond to something I get in an email than I would if the same thing were said to me in person.

31. I need to be more careful about what I say to someone in person than in an email.
IV. Disclosure (Openness)

Definition: The willingness of communicators to disclose personal or private information in conversations or emails; the extent to which openness and honesty of expression characterizes those communications.

4. In a conversation, I am less likely to share personal information with someone I hardly know than in an email message.

11. I am more likely to “stretch the truth” about something in an email than I am in a conversation.

18. I find it’s more difficult to talk about my true feelings and thoughts in conversations than it is in emails.

25. In an email, I find it’s easier to say something harsh or critical than it is to say the same thing in person.

32. I prefer to say something nice to others in person rather than writing it to them in an email.

V. Emotionality

Definition: The extent to which exaggerated or inappropriate emotional expression or affective tone is used in conversation or e-mail.

5. I am more likely to control or restrain my emotions in a conversation than in an email.

12. It’s easier to “go off” on someone in an email message than it is in a conversation.

19. When I’m really upset with someone, I’d rather tell them in an email than in person.

26. I would “flame” (make an insulting or critical remark to) someone in an email before I would do it to their face.

33. When writing an email, I have to take my emotional expression up a notch or two to achieve the same effect I would have in a conversation.
VI. Anonymity (Depersonalization)

**Definition:** The degree to which conversations or emails are felt to be impersonal or private.

6. When I write an email, I feel much more like I am thinking to myself than I do when I am having a conversation with someone.

13. When I talk with someone, I have a greater sense that the conversation is public than I do when I am having email exchanges.

20. When using email, I feel like I can take more liberties with what I say than I can in a conversation.

27. In a conversation, I’m less likely to say things I’m unsure about than I am in an email.

34. I never feel quite as personally connected to someone when writing an email as I do in a conversation.

VII. Homogeneity

**Definition:** The extent to which the form or content of conversations or emails are differentiated by the communicator based on the status or position of the recipient(s).

7. I might say things to superiors (for example, professors or managers) in an email that I would not say to them in a conversation.

14. I am less likely to be conscious of proper etiquette in emails than in conversations.

21. I am more likely to send an identical email to peers and superiors (for example, professors or managers) than I am to speak in person with them in an identical way.

28. In an email, I am less likely to be mindful of the other person’s position or status than when talking with them.

35. I am more reserved when conversing with superiors (for example, professors or managers) than when emailing them.
APPENDIX E

RESULTING (POST-FACTOR ANALYSIS) ITEM MAPPINGS: TECHNOLOGICAL INSULARITY SCALE (TIS)

I: “Formality”

1. I am more likely to use the correct rules of language in a conversation than in an email.

8. I tend to watch my grammar less in emails than in conversations.

14. I am less likely to be conscious of proper etiquette in emails than in conversations.

15. In a conversation, I pay more attention to the proper use of words than I do in an email.

22. I am less concerned about how I structure my sentences in an email than in a conversation.

29. I am less formal in an email than in a conversation.

II: “Connectedness/Responsiveness”

17. I am more responsive to others in a conversation than in an email.

32. I prefer to say something nice to others in person rather than writing it to them in an email.

33. When writing an email, I have to take my emotional expression up a notch or two to achieve the same effect I would have in a conversation.
34. I never feel quite as personally connected to someone when writing an email as I do in a conversation.

III: “Focus on Self and Personal Information”

2. When writing an email, I tend to think less about how other people will react to what I am saying than when I am talking to them.

3. In a conversation, I am more likely to adjust what I say based on who I am communicating with than I am using email.

4. In a conversation, I am less likely to share personal information with someone I hardly know than in an email message.

7. I might say things to superiors (for example, professors or managers) in an email that I would not say to them in a conversation.

9. In a conversation, I am more likely to consider how what I say will be taken from the other person’s point of view than when I am writing an email.”

10. I am less likely to pay attention to the tone of what I am saying in an email than when I am having a conversation.

16. I am less concerned about people taking things the wrong way when I write an email than when I have a conversation.

24. I spend less time thinking about how to respond to something I get in an email than I would if the same thing were said to me in person.

30. I am less concerned about accidentally offending or hurting someone’s feelings in an email than I am when talking with them.

31. I need to be more careful about what I say to someone in person than in an email.

IV: “Emotional Flexibility/Lack of Constraints”

5. I am more likely to control or restrain my emotions in a conversation than in an email.

11. I am more likely to “stretch the truth” about something in an email than I am in a conversation.

12. It’s easier to “go off” on someone in an email message than it is in a conversation.
18. I find it’s more difficult to talk about my true feelings and thoughts in conversations than it is in emails.

19. When I’m really upset with someone, I’d rather tell them in an email than in person.

20. When using email, I feel like I can take more liberties with what I say than I can in a conversation.

25. In an email, I find it’s easier to say something harsh or critical than it is to say the same thing in person.

26. I would “flame” (make an insulting or critical remark to) someone in an email before I would do it to their face.

Items Loaded on by Multiple Factors, and Therefore Eliminated:

6. When I write an email, I feel much more like I am thinking to myself than I do when I am having a conversation with someone.

13. When I talk with someone, I have a greater sense that the conversation is public than I do when I am having email exchanges.

21. I am more likely to send an identical email to peers and superiors (for example, professors or managers) than I am to speak in person with them in an identical way.

23. When I write an email, I tend to focus more on what I want to say, rather than what the other person might want to say, than I do when I am having a conversation with someone.

27. In a conversation, I’m less likely to say things I’m unsure about than I am in an email.

28. In an email, I am less likely to be mindful of the other person’s position or status than when talking with them.

35. I am more reserved when conversing with superiors (for example, professors or managers) than when emailing them.
APPENDIX F

THE MARLOWE-CROWN SOCIAL DESIRABILITY SCALE

(Crowne & Marlowe, 1964; MCSD)

Instructions. Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true (T) or false (F) as it pertains to you.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Before voting I thoroughly investigate the qualifications of all the candidates.</td>
<td>T</td>
</tr>
<tr>
<td>2.</td>
<td>I never hesitate to go out of my way to help someone in trouble.</td>
<td>T</td>
</tr>
<tr>
<td>3.</td>
<td>It is sometimes hard for me to go on with my work if I am not encouraged.</td>
<td>T</td>
</tr>
<tr>
<td>4.</td>
<td>I have never intensely disliked anyone.</td>
<td>T</td>
</tr>
<tr>
<td>5.</td>
<td>On occasion I have had doubts about my ability to succeed in life.</td>
<td>T</td>
</tr>
<tr>
<td>6.</td>
<td>I sometimes feel resentful when I don't get my way.</td>
<td>T</td>
</tr>
<tr>
<td>7.</td>
<td>I am always careful about my manner of dress.</td>
<td>T</td>
</tr>
<tr>
<td>8.</td>
<td>My table manners at home are as good as when I eat out in a restaurant.</td>
<td>T</td>
</tr>
<tr>
<td>9.</td>
<td>If I could get into a movie without paying and be sure I was not seen, I would probably do it.</td>
<td>T</td>
</tr>
<tr>
<td>10.</td>
<td>On a few occasions, I have given up doing something because I thought too little of my ability.</td>
<td>T</td>
</tr>
<tr>
<td>11.</td>
<td>I like to gossip at times.</td>
<td>T</td>
</tr>
<tr>
<td>12.</td>
<td>There have been times when I felt like rebelling against people in authority even though I knew they were right.</td>
<td>T</td>
</tr>
<tr>
<td>13.</td>
<td>No matter who I'm talking to, I'm always a good listener.</td>
<td>T</td>
</tr>
<tr>
<td>14.</td>
<td>I can remember &quot;playing sick&quot; to get out of something.</td>
<td>T</td>
</tr>
<tr>
<td>15.</td>
<td>There have been occasions when I took advantage of someone.</td>
<td>T</td>
</tr>
<tr>
<td>16.</td>
<td>I'm always willing to admit it when I make a mistake.</td>
<td>T</td>
</tr>
<tr>
<td>17.</td>
<td>I always try to practice what I preach.</td>
<td>T</td>
</tr>
<tr>
<td>18.</td>
<td>I don't find it particularly difficult to get along with loud-mouthed, obnoxious people.</td>
<td>T</td>
</tr>
<tr>
<td>19.</td>
<td>I sometimes try to get even, rather than forgive and forget.</td>
<td>T</td>
</tr>
<tr>
<td>20.</td>
<td>When I don't know something I don't at all mind admitting it.</td>
<td>T</td>
</tr>
<tr>
<td>21.</td>
<td>I am always courteous, even to people who are disagreeable.</td>
<td>T</td>
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<tr>
<td>22.</td>
<td>At times I have really insisted on having things my own way.</td>
<td>T</td>
</tr>
<tr>
<td>23.</td>
<td>There have been occasions when I felt like smashing things.</td>
<td>T</td>
</tr>
<tr>
<td>24.</td>
<td>I would never think of letting someone else be punished for my wrongdoings.</td>
<td>T</td>
</tr>
<tr>
<td>25.</td>
<td>I never resent being asked to return a favor.</td>
<td>T</td>
</tr>
<tr>
<td>26.</td>
<td>I have never been irked when people expressed ideas very different from my own.</td>
<td>T</td>
</tr>
<tr>
<td>27.</td>
<td>I never make a long trip without checking the safety of my car.</td>
<td>T</td>
</tr>
<tr>
<td>28.</td>
<td>There have been times when I was quite jealous of the good fortune of others.</td>
<td>T</td>
</tr>
<tr>
<td>29.</td>
<td>I have almost never felt the urge to tell someone off.</td>
<td>T</td>
</tr>
<tr>
<td>30.</td>
<td>I am sometimes irritated by people who ask favors of me.</td>
<td>T</td>
</tr>
<tr>
<td>31.</td>
<td>I have never felt that I was punished without cause.</td>
<td>T</td>
</tr>
<tr>
<td>32.</td>
<td>I sometimes think when people have a misfortune they only got what they deserved.</td>
<td>T</td>
</tr>
<tr>
<td>33.</td>
<td>I have never deliberately said something that hurt someone's feelings.</td>
<td>T</td>
</tr>
</tbody>
</table>
APPENDIX G

THE EMPATHY SCALE (Caruso & Mayer, 1998)

“-R” indicates that the item is reverse-scored

1. I cry easily when watching a sad movie.

2. Certain pieces of music can really move me.

3. Seeing a hurt animal by the side of the road is very upsetting.

4-R. I don't give others' feelings much thought.

5. It makes me happy when I see people being nice to each other.

6. The suffering of others deeply disturbs me.

7. I always try to tune in to the feelings of those around me.

8. I get very upset when I see a young child who is being treated meanly.

9-R. Too much is made of the suffering of pets or animals.

10. If someone is upset I get upset, too.

11. When I'm with other people who are laughing I join in.

12. It makes me mad to see someone treated unjustly.

13-R. I rarely take notice when people treat each other warmly.

14. I feel happy when I see people laughing and enjoying themselves.
15. It's easy for me to get carried away by other people's emotions.

16-R. My feelings are my own and don’t reflect how others feel.

17. If a crowd gets excited about something so do I.

18. I feel good when I help someone out or do something nice for someone.

19. I feel deeply for others.

20-R. I don't cry easily.

21. I feel other people's pain.

22. Seeing other people smile makes me smile.

23. Being around happy people makes me feel happy, too.

24. TV or news stories about injured or sick children greatly upset me.

25. I cry at sad parts of the books I read.

26. Being around people who are depressed brings my mood down.

27-R. I find it annoying when people cry in public.

28. It hurts to see another person in pain.

29. I get a warm feeling for someone if I see them helping another person.

30. I feel other people's joy.
APPENDIX H

SOCIAL ISOLATION SUBSCALE OF DEAN’S POWERLESSNESS SCALE (Dean, 1961)

“*” Indicates that the item is reverse-scored

Please check in the appropriate blank, as follows:
A (Strongly Agree)
a (Agree)
U (Uncertain)
d (Disagree)
D (Strongly Disagree)

Sometimes I feel all alone in the world.
I don't get invited out by friends as often as I'd really like.
Most people today seldom feel lonely. *
Real friends are as easy as ever to find.*
One can always find friends if he shows himself friendly.*
The world in which we live is basically a friendly place. *
There are few dependable ties between people any more.
People are just naturally friendly and helpful. *
I don't get to visit friends as often as I'd really like.


