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Human factors issues with the use of text-speak communication

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Introduction

Advances in communication technology have significantly changed how individuals communicate (Crystal, 2008). Individuals not only have auditory communication at the their disposal, but also text based communication available through cell phones or computers. Emergency response agencies have begun to utilize text messaging to warn people of impending natural disasters (Samarajiva & Waidvanatha, 2009). These early warning systems can likely save lives by allowing people to prepare accordingly.

Text messaging may also be useful in actual emergency management operations, such as disaster response. In these settings, text based communication could be more beneficial than auditory communication in that it allows an individual to reread a message a later time; text messages serve as an augmentation to human memory which is fallible. For example, civil defense personnel could receive a text message in which details are critical (e.g., survivors on third floor of bank near stairway). Once the message is received, one can reread the message and extract key information that could potentially save lives. One potential problem with text messaging is the limited amount of space available and time it takes to write

To overcome limited amount of space the time limits, individuals incorporate shortening techniques (i.e., text-speak) that allows an individual to convey a word or phrase in a shorter amount of time and decreased amount of space (e.g., **srvvrs on 3rd flor of bnk near th strwy**, survivors on the third floor of the bank near the stairway). Although text-speak allows one to create a message faster and in a shorter amount of space, processing text-speak could exact a cognitive cost to the reader (Head, et al., 2012). It is likely that civil defense workers responding to natural disasters could be subject to processing text-speak while text messaging. For example, it is common for civil defense to use shortening techniques such as acronyms (e.g., EQC-earthquake commission, GEOC-Group Emergency Operations Centre and MoH- Ministry of Health).

Aims

Investigate the cognitive cost (i.e., mental effort) in processing text speak using a dual-task paradigm (completing two tasks at the same time).

To determine whether experience with text-speak has a modulating effect on performance.

Method

Informed consents were obtained from 40 (26 female) native English speaking, University of Canterbury students with normal vision.
Stimuli consisted of two stories and two baseline conditions. Participants first completed a baseline condition where they only responded to vibrations.
Participants then read a correctly spelled story and a story composed of text-speak. Participants were required to respond to the vibrations as they read the stories.
Words were shown individually in the centre of the screen for 500 msec.
Vibrations occurred for 100 ms on the right or left side at random.
Participants were given 1000 ms to respond to the vibration.
Participants completed a second baseline condition after reading the two stories.
Participants completed a reading and comprehension test on both stories and also a text-speak experience questionnaire (Head et al., 2011).

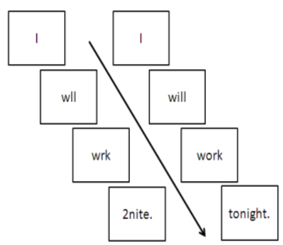


Figure above depicts word presentation example of text-speak and correctly spelled stimuli.

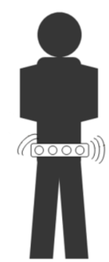
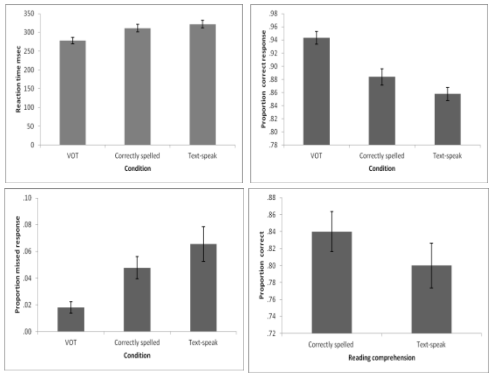


Figure above depicts a example of vibrotactile stimulation.

Results

Responses to the baseline condition was significantly faster than the dual-task conditions.
$F(2, 78) = 11.14$, $p < .001$, $\eta^2_p = .22$.
Location responses were faster when reading correctly spelled versus text-speak.
$F(1,39) = 4.15$, $p = .05$, $\eta^2_p = .01$.
Significantly increased accuracy in the baseline condition verse the dual-task conditions.
$F(1, 39) = 81.19$, $p < .001$, $\eta^2_p = .58$.
Significantly improved accuracy in the correctly spelled condition versus text-speak dual-task .
$F(1, 39) = 7.78$, $p = .008$, $\eta^2_p = .17$.
Less missed signal in the baseline condition relative to the dual-task conditions.
$F(2, 78) = 26.81$, $p > .001$, $\eta^2_p = .41$.
No significant difference in missed signals between correctly spelled and text-speak dual-task.
Significant correlation between willingness to use text-speak and correct responses to text-speak dual-task.
$r(39) = -.313$, $p = .05$.
No significant difference in comprehension scores between text-speak or correctly spelled.



Note
Vibration only task (VOT)
Correctly spelled – vibration task +reading a correctly spelled story
Text-speak – vibration task + reading a text-speak story

Discussion

Performance was significantly impaired in the dual-task (reading and responding to vibrations) versus responding to a vibration only.

Speed and accuracy of vibration location response was impaired more when reading text-speak compared to correctly spelled versions of the same story.

The dual-task condition was sensitive in distinguishing cognitive demands between correctly spelled and text-speak stories presented in the dual task.

The text-speak questionnaire was successful in showing a relationship between self-reported willingness to use text-speak and behavioral results.

The higher than expected reading comprehension scores for the text-speak condition can be attributed to a performance comprehension trade-off (see Head et al., 2011).

Collectively, the results support that text-speak is not processed as easily as correctly spelled. This should be considered when using common acronyms or other forms of text-speak in applied settings.

References

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