Using psychophysiology to study the emotional impact of words used in behaviour change text messages

Mata-Cervantes G, Westerman SJ, Burke MRF, Hill AJ, Wyatt JC

Background
There is a great interest in text message (SMS) interventions to deliver health promotion messages and systematic reviews show these are sometimes effective and improve short-term behaviour [1]. Tailoring text messages to reach people on an emotional level is especially effective [2].

Studying the psychophysiological response to text messages - eg. electrodermal activity (EDA) or facial electromyography (fEMG) – may help us understand and increase their emotional appeal, increasing their impact on important health and lifestyle problems. This is the basis of Neuromarketing.

Methods
Forty participants (18-45 years, good English, not visually impaired or suffering from chronic neurological disorders or taking muscle relaxants, anticholinergics, etc.) were recruited. They read 18 sample high, to low arousal and positive to negative valence words from the Affective Norms for English Words (ANEW) [3] list, 5 frequently used words in PA text messages, their name, and 6 nonsense words (to make participants read every word). Participants were shown the same words in random order on five occasions during the test session while EDA and fEMG were recorded.

Results
There is strong correlation between corrugator superciliii reactivity and valence ratings (r = 0.617, p = 0.005) and moderate correlation between EDA reactivity and arousal ratings (r = 0.486, p = 0.035) for the ANEW list words. As expected, participants responded strongly to their name with EDA reactivity but no corrugator activity.

Conclusions
The strong associations between these psychophysiology measures and the known valence words shows that EDA and EDA give us useful insights into people’s emotional reactions to words. These methods could help us evaluate SMS messages before deploying them and, thus, improve the impact of an SMS library. Participant’s positive EDA response to their name reinforces recommendations from other studies to use the name in SMS messages to increase emotional impact. Surprisingly, participant name was not used in any of the 5 text message libraries for PA promotion that we were able to review.

Further studies are now comparing levels of arousal and valence in text messages used in successful and unsuccessful interventions, to see if it is possible to predict the likelihood of success. Modifications of unsuccessful messages and those with low emotional impact will also be explored, using insights from this and previous studies.

References