The Influence of Emotional Context on the Comprehension of Descriptive Information of Websites: An ERP Analysis

Amir Riaz, Australian National University (ANU), Shirley Gregor, ANU, Qing Xu, Zhejiang University, Aleck Lin, National Dong-Hwa University, Alex Richardson, ANU

Corresponding author: Amir.Riaz@anu.edu.au

The aim of this study is to investigate whether or not emotional context as compared to non-emotional context improves the comprehensibility of descriptive information given on informational websites (e.g., government websites).

Descriptive information refers to "isolated facts without an explanation of the relationships between these facts" whereas explanative information refers to "organized facts connected by their underlying functional relationship." (Lim and Benbasat 2002, p.99). Any given informational website normally consists of descriptive as well as explanative information. Comprehension of both of these types of information on websites has been studied but findings concerning purely descriptive information do not offer any suggestions to improve its comprehension (Chmielewski and Dansereau 1998; Hong et al. 2004; Lim and Benbasat 2002). However, theory of cognitive neuroscience offers an opportunity to improve comprehension by presenting descriptive information in an emotional context (Smith et al. 2004). This challenge is taken up in this paper.

In line with prior literature (e.g., Lim and Benbasat 2002), comprehension of descriptive information in this study refers to the recall of facts that are explicitly mentioned in the given information. Theory of cognitive neuroscience of emotions posits that when information is presented in an emotional context, an emotional tag is added to the information being encoded, which facilitates the recall of such information at later stages (Smith et al. 2004). Therefore, it is proposed that the recall of descriptive information given in an emotional context will be higher than in neutral or non-emotional context. Kock et al. (2008) provide empirical evidence for this theoretical assumption. They showed some of the participants a picture of a snake during the presentation of web modules consisting of financial terms. They found that the participants who saw the picture, scored higher on information recall.

In a lab experiment, participants will be shown names of medicines embedded with emotional or non-emotional pictures (Wiswede et al. 2006) in a within-subjects design. Emotions will be measured using self-reported scales and electroencephalography (EEG). From raw EEG, time-locked changes in electrical potential associated with a specific event called event-related potentials (ERPs) will be extracted and analysed.

NeuroIS technique – ERPs, will be used to measure emotions for various reasons. First, emotions "often do not reach the level of awareness, and therefore it is not possible to report on them in survey or interview studies," (Davis et al. 2012, p.2). Second, though there are other NeuroIS techniques such as functional neuroimaging, skin conductance etc., which can be used to measure emotions, they may not be suitable for this study because of their poor temporal resolution. Emotions are short-lived and may alter early stages of information processing (Hajacak et al. 2012). Therefore, ERPs because of their capability of indexing neural activity with a time scale of milliseconds, offers a more reliable measurement. Emotional stimuli can enhance the amplitude of various ERP components from P1 to P3 (Hajcak et al. 2012), therefore, this study will examine all ERP components ranges from P1 to P3. Subordinate dimensions of emotion – valence and arousal, will be examined in this study only, because "no ERP component has been found that reflects a specific emotion" (Hajcak et al. 2012, p. 442). Comprehension of descriptive information will be measured using fact-based questions. Post-experiment interviews will also be conducted to further validate the findings.

REFERENCES

❖ Chielewski, T. L., and Dansereau, D. F.1998. "Enhancing The Recall Of Text: Knowledge Mapping Training Promotes Implicit Transfer," *Journal of Educational Psychology* (90:3), pp. 407-413.

❖ Davis, F. D., Henver, A. R., and Riedl, R. 2012. "Methods, Tools, and Measurement in NeuroIS Research," *Journal of the Association for Information Systems,* Call for Papers. Special Issue.

❖ Hajcak, G., Weinberg, A., MacNamara, A., and Foti, D. 2012. "ERPs and the Study of Emotion," In *The Oxford Handbook of Event-Related Potential Components,* S. J. Luck & E. S. Kappenman (eds), Oxford University Press, pp. 441-472.

❖ Hong, W., Thong, J. Y. L., and Tam, K. Y. 2004. "Does Animation Attract Online User's Attention? The effects of Flash on Information Search Performance and Perception," *Information System Research* (15:1), pp. 60-86.

❖ Kock, N., Chatelain-Jardón, R., & Carmona, J. 2008. "An Experimental Study of Simulated Web-Based Threats and Their Impact on Knowledge Communication Effectiveness," *IEEE Transactions on Professional Communication* (51:2), pp. 183-197.

❖ Lim, K., and Benbasat, I. 2002. "The Influence Of Multimedia On Improving The Comprehension Of Organizational Information," *Journal of Management Information Systems* (19:1), pp. 99-127.

❖ Smith, A. P. R., Dolan, R. J., and Rugg, M. D. 2004. "Event-Related Potential Correlates Of the Retrieval of Emotional and Non-Emotional Context," *Journal of Cognitive Neuroscience* (16:5), pp. 760-775.

❖ Wiswede, D., Russeler, J., Hasselbach, S., and Munte, T. F. 2006. "Memory Recall In Arousing Situations – An Emotional Von Restroff Effect?" *BMC Neuroscience* (7:57), pp. 1-12.