

Gender differences in the perception of speech prosody and visual prosody in L2

Suzanne Verheul, Adriana Hartmann¹, Roselinde Supheert, Aoju Chen
Utrecht University

s.verheul@hotmail.com, adrianahartmann@mac.com, r.g.j.l.supheert@uu.nl, aoju.chen@uu.nl

Introduction: Speakers vary speech prosody (hereafter prosody) and visual prosody (facial expression and body language) to attach emotional information to words [e.g., 3-6, 10]. The receiving party registers and recognises these emotions “by ears and eyes” [12]. Previous studies have examined gender differences in emotion recognition in L1. [1] and [2] found that women performed better than men in emotion recognition based on either facial expressions or body language, whereas [8] and [9] did not find such ‘female superiority’ in the recognition of facially expressed emotions. Relatedly, [7] analysed gender differences in emotional contagion, and found that women shared the targets’ emotional states more readily than men, although no distinction was made between body language and prosody. However, little is known about gender differences in the interpretation of emotional prosody and visual prosody in L2. [11, 12] found that L2 speakers need to be exposed to the language extensively to identify accurately emotions expressed via prosody [14]. Besides, past work typically used materials recorded by actors in a laboratory, limiting the implications of the findings on emotional recognition in real life. Further, there was hardly any research on the interpretation of emotionality (i.e. intensity of emotion) expressed via prosody and visual prosody.

In the present study, we examined gender differences in both recognition of types of emotion (e.g. anger, joy) and interpretation of overall emotionality expressed via prosody and visual prosody (e.g. the degree of anger) with L2 English speakers. For this, we used scenes selected from film adaptations of *Jane Eyre*. The emotions expressed in these particular scenes were determined by close reading of the parallel passages from the novel. Based on [1, 2] and the assumption of L2 transfer, we predicted that women would be more accurate in recognising emotions both from prosody and from visual prosody in L2. In the light of [10], we predicted that women would more readily perceive heightened emotion expressed via prosody and visual prosody than men.

Method: We conducted a perception experiment with proficient speakers of English with Dutch as their L1 (N = 30, 15 female). The participants rated the overall emotionality of the protagonists in two film versions of *Jane Eyre* in one session and identified the specific type of emotion in the other session. The participants were familiar with neither the novel *Jane Eyre* by Charlotte Brontë nor the films prior to the experiment. They were presented with 24 clips of the two film adaptations of *Jane Eyre* (1997, 2011); 12 of these were audio-only and 12 were image-only. They rated the degree of emotionality on a 5-point scale and identified the specific type of emotion from the perspective of each protagonist (Mr Rochester, Jane) separately by choosing 1 out of 3 options, namely sadness, happiness, and neutral.

Results: Linear Mixed Modeling revealed that the fixed factor *gender* did not have a main effect on the interpretation of overall emotionality. Neither was there a significant interaction between gender and the factor ‘modality (prosody vs. visual prosody)’. Chi-Square analysis was used to assess gender differences in the ability to perceive type of emotion. There was no significant effect of gender on the ability to recognise type of emotion from visual prosody but a significant effect of gender on the ability to recognise type of emotion from prosody ($p = .035$) with the female participants being more accurate.

Conclusion: The male and female Dutch speakers of English achieved similar scores in recognising emotionality expressed via prosody and visual prosody in English. The female speakers were more accurate in recognising type of emotions expressed via prosody, in line with predictions based on L1 transfer. However, the male and female speakers were similarly accurate in recognising type of emotions expressed via visual prosody, contra predictions based on L1 transfer. This finding suggests sensitivity to visual prosody in L1 does not necessarily help in L2, possibly due to larger L1-L2 differences in visual prosody than in prosody.

¹ The first two authors contributed equally to the study reported in this abstract

REFERENCES

- [1] Alaerts, K., Nackaerts, E., Meyns, P., Swinnen, S. P., Wenderoth, N. (2011). Action and emotion recognition from point light displays: An investigation of gender differences. *Plos ONE*, 6(6). e20989.
- [2] Baron-Cohen S., & Wheelwright S. (2004). The empathy quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *J Autism Dev Discord*, 34. 163-175.
- [3] Bostanov, V., & Kotchoubey, B. (2004). Recognition of affective prosody: Continuous wavelet measures of event-related brain potentials to emotional exclamations. *Psychophysiology* 41, 259–268.
- [4] Buchanan T.W., Lutz, K., Mirzazade, S., Specht, K., Shah, N.J., Zilles, K., & Jancke, L. (2000). Recognition of emotional prosody and verbal components of spoken language: an fMRI study. *Cognitive Brain Research*, 9, 227-238.
- [5] Campbell, Nick (2004). Perception of affect in speech - towards an automatic processing of paralinguistic information in spoken conversation.” *International Conference of Spoken Language*, 881-884.
- [6] Castellano, G., Kessous, L., & Caridakis, G. (2008). Emotion recognition through multiple modalities: face, body gesture, speech. Peter C., Beale R. (eds.). *IEEE Transactions on Affective Computing*, 1(1), 18-37.
- [7] Doherty, R. William, Orimoto, Lisa, Singelis, Theodore M., Hatfield, Elaine, & Hebb, Janine. (1995). Emotional contagion: gender and occupational differences. *Psychology of Women Quarterly*, 19, 355-371.
- [8] Grimshaw, G. M., Bulman-Fleming, M. B., & Ngo C. (2004). A signal-detection analysis of sex differences in the perception of emotional faces. *Brain Cogn*, 54. 248-250.
- [9] Kessler, H., Hoffman, H., Bayerl, P., Neumann, H., Basic, A., et al. (2005). Measuring emotion recognition from computer morphing: New methods for research and clinical practice. *Nervenheilkunde*
- [10] Rinn, W. E. (1984). The neuropsychology of facial expression: A review of the neurological and psychological mechanism for producing facial expression. *Psychological Bulletin*, 95, 52-77.
- [11] Scherer, K. R., R. Banse & H. G. Wallbott (2001). Emotion inferences from vocal expression correlate across languages and cultures. *Journal of Cross-Cultural Psychology*, 32, 76–92.
- [12] Tickle, A. (2000). English and Japanese speaker’s emotion vocalizations and recognition: a comparison highlighting vowel quality. In R. Cowie, E. Douglas-Cowie & M. Schröder (eds.) *A conceptual framework for research. Proceedings of the ISCA Workshop on Speech and Emotion, Belfast*, 104–109.
- [13] Wallbott, Harald G. Bodily expression of emotion. *European Journal of Social Psychology* 28 (1998): 879-896.
- [14] Zhu, Yinyin. (2013). Chapter 2: background and methodology. In *Expression and recognition of emotion in native and foreign speech: the case of Mandarin and Dutch* (12-13). Utrecht, Utrecht: LOT.