



# Negative “gossip” stimuli modulate left-lateralized P<sub>1</sub> component while viewing neutral faces

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## Introduction

Reading short “gossip” phrases affects the amount of time an unknown face is dominant in a binocular rivalry paradigm (Anderson et al., 2011), suggesting that linguistically-conveyed social information can affect perception.

However, visual dominance time is measured as an introspective report of conscious experience. We wondered whether an effect could also be measured at early stages of perception, using electrophysiological measures.

We hypothesized that negative gossip would modulate the face-sensitive N170 ERP component, measured at the P7 and P8 electrodes.

## Methods

Gossip stimuli were those used by Anderson et al. (2011), translated to Danish. Neutral faces were taken from the PUT database (Kasinski et al., 2008). Participants (n=30) viewed twenty faces together with the gossip stimuli a total of six times. They were asked to imagine the person having the experience or carrying out the act described. “Gossip” conditions were Social Positive, Social Negative, Non-social Positive, or Non-social Negative.

32 channels of EEG were recorded while participants viewed the twenty trained faces mixed with forty unfamiliar faces, and images of houses. To maintain concentration, and to reduce attention to faces, participants performed a 1-back working memory task with the images of houses. Finally, participants rated their memory of each face on a five-point scale.



SP: “Helped an elderly woman with her groceries”

SN: “Threw a chair at his classmate”

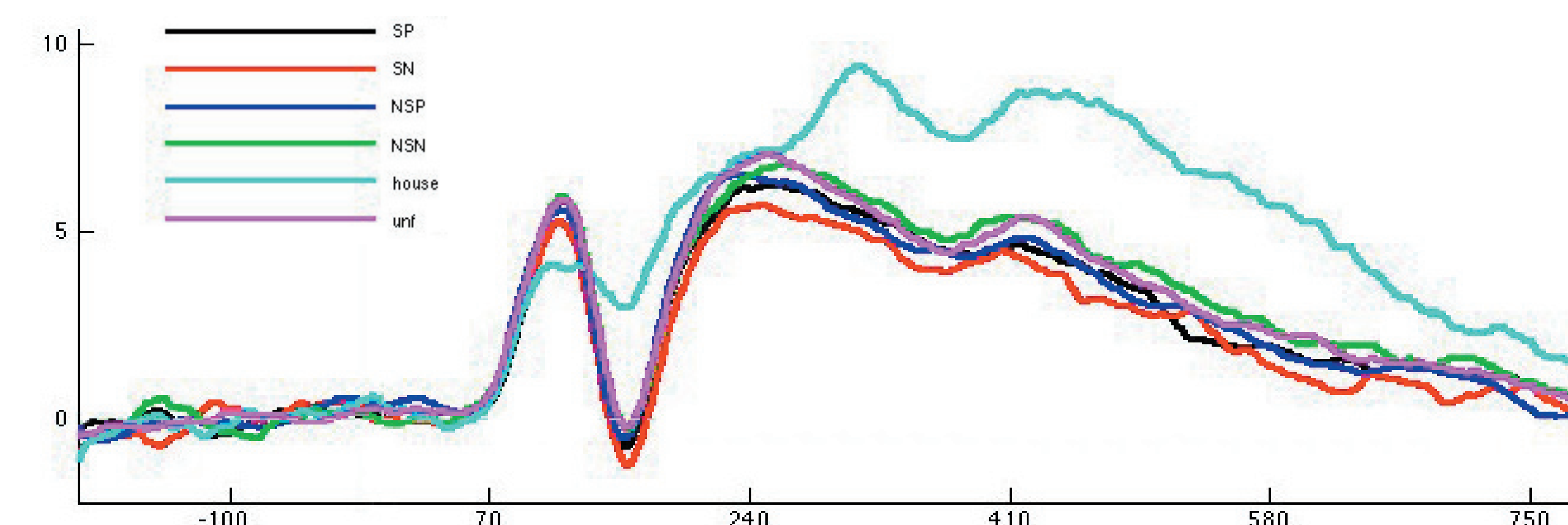
NSP: “Read a good book”

NSN: “Missed his flight”

## Results

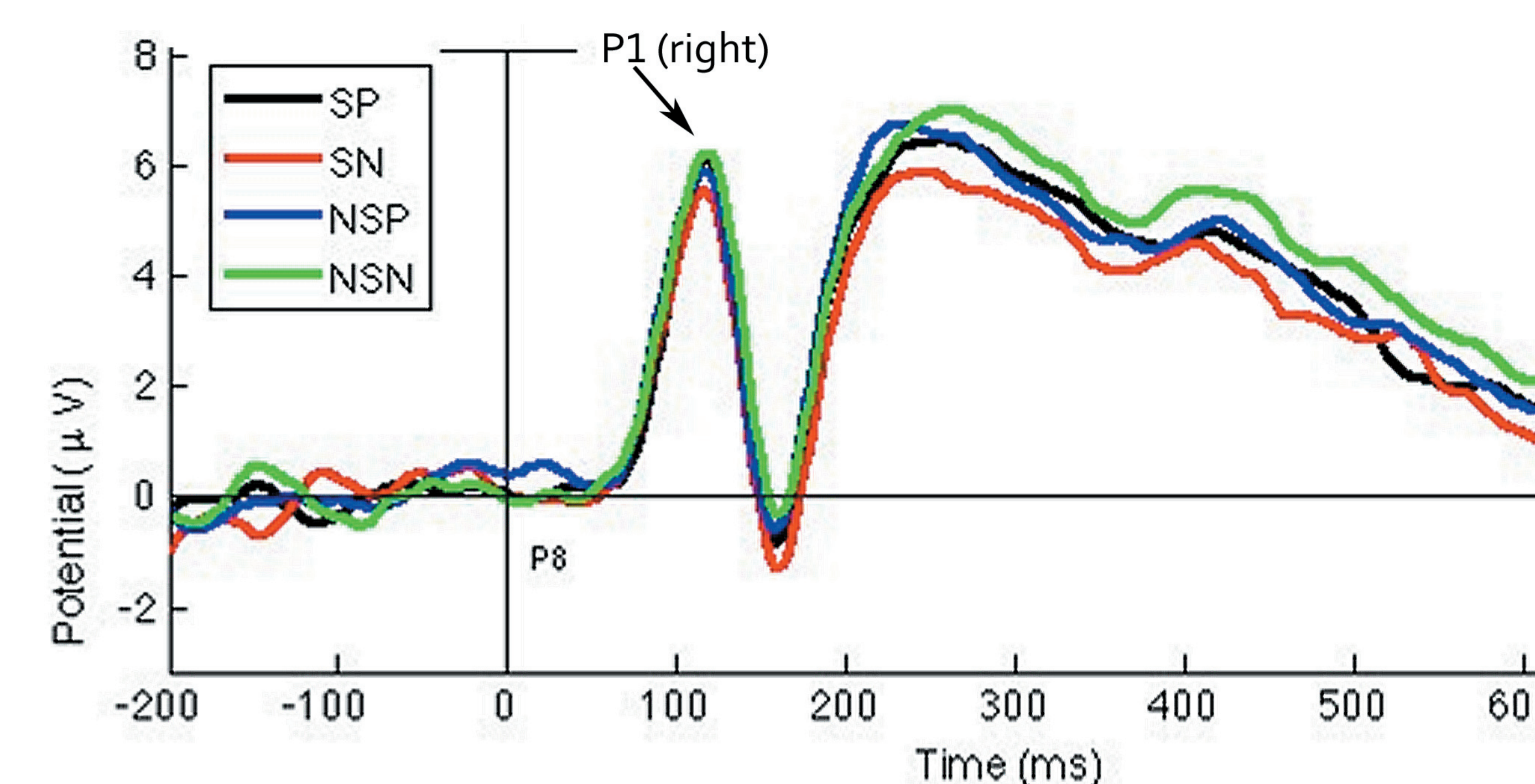
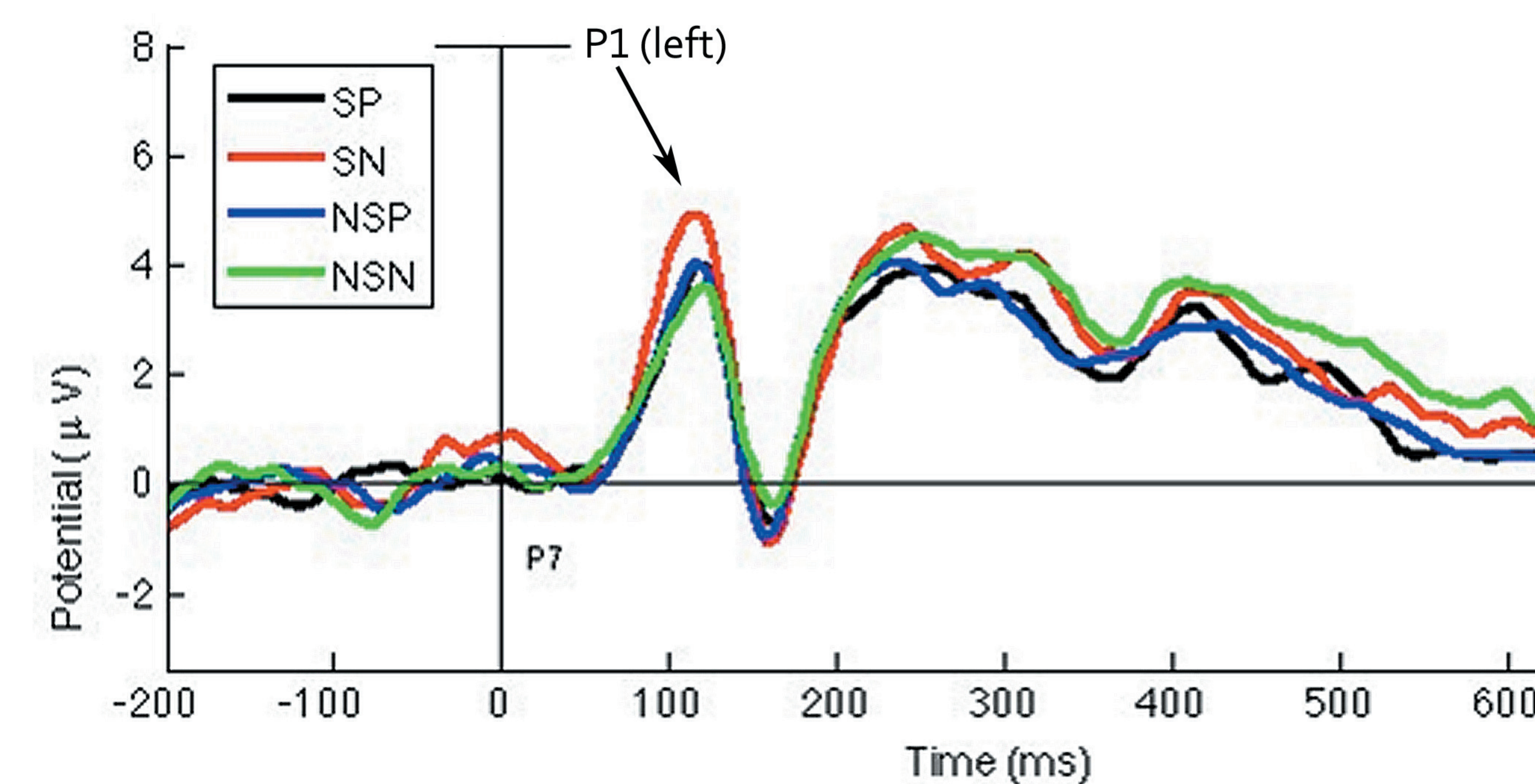
### N170

All faces elicited a reliable N170 effect, when compared to houses, but there was no significant effect of the gossip stimuli on the N170.



### P1

However, a secondary analysis found that an earlier component, the P<sub>1</sub>, was modulated by the gossip stimuli on the left, but not on the right.



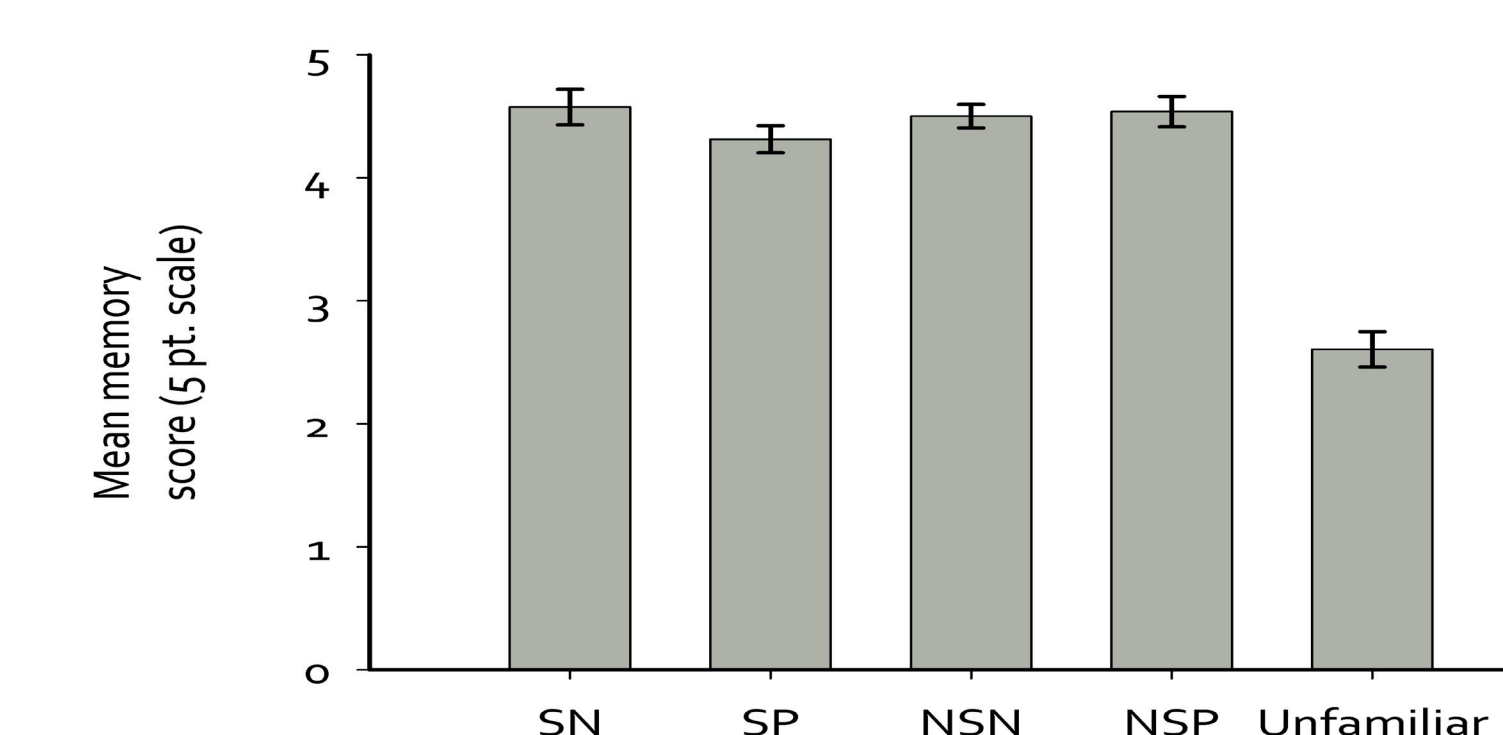
## Results, continued

### P<sub>1</sub>, continued

A 2 x 2 within subjects ANOVA was calculated with Sociality (social vs. non-social) and Valence (positive vs. negative) as the factors. On the left, there was a significant main effect of Sociality  $F(1,29)=6.08$ ,  $p=0.019$ , but no main effect of Valence  $F(1,29)=0.002$ ,  $p=0.96$ . There was a strong trend toward a Sociality x Valence interaction  $F(1,29)=3.93$ ,  $p=0.056$ . On the right, neither Sociality  $F(1,29)=0.155$ ,  $p=0.69$ , Valence  $F(1,29)=0.015$ ,  $p=0.90$ , nor the interaction  $F(1,29)=1.01$ ,  $p=0.32$  showed any effect.

### Memory

Although participants remembered the faces they had trained on nearly twice as well as those they had only seen once before, their rated memory for faces was not affected by which gossip was associated with each face.



## Conclusion

Supporting the results of Anderson et al. (2011), we found that linguistic information modulates early processing of faces. Although the N170 appears impervious to the influence of gossip, an effect of negative social information was measured at 100 ms. after stimulus onset, in occipital and parietal electrodes.

That the effect was lateralized to the left hemisphere electrodes is particularly interesting. Previous work by Mo et al. (2011) has shown a left-lateralized effect of native-language color terms on occipital and parietal electrodes during color perception between 130 and 190 ms. We speculate that the effect measured here may reflect a similar influence of socially-relevant negative words suggesting violent, cruel, or deceitful behavior on early visual responses to the faces these words have been associated with.

That the gossip stimuli had no effect on participants’ memory of the faces suggests that the effect of the stimuli was primarily on lower-level perceptual processes. We plan a follow-up study, in which participants gradually learn more about the people depicted.

## References

Anderson, E., Siegal, E., Bliss-Moreau, E., and Feldman Barrett, L. (2011) The visual impact of gossip. *Science* 302 (37), pp. 1446-1448.  
Kasinski A., Florek A., Schmidt A. (2008) The PUT face database. *Image Processing & Communications*, 13 (3-4), pp. 59-64.  
Mo, L., Xu, G., Kay, P., and Tan, L-H. (2011) Electrophysiological evidence for the left-lateralized effect of language on preattentive categorical perception of color. *PNAS* 108 (34), pp. 14026-14030.