



Bimodal, Synchronous Displays, but not Unimodal, Visual Displays, Elicit Gender Discrimination in 6-month-old Infants

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Abstract

Previous gender discrimination research has investigated infants' abilities using both unimodal visual and bimodal audiovisual stimulation, but has not investigated type of stimulation as a factor in the development of gender discrimination. The current study compared infants' discrimination of gender in unimodal visual and bimodal audiovisual stimulation. Six-month-old infants discriminated highly typical male and female faces in bimodal audiovisual presentations, but not unimodal visual presentations. These results support the hypothesis that synchronous bimodal presentations enhance detection of gender. The specific mechanisms underlying intermodal facilitation of gender discrimination will be explored in future research.

Background

Face perception in general, and gender discrimination in particular, requires discrimination of very subtle differences in the fine details of the face. Previous research investigating the development of gender discrimination during infancy has employed various research methods and stimuli. Newell, Strauss, and Best (2003) indicated that when infants were presented with unimodal visual stimuli, gender-typical faces (i.e., very masculine or very feminine) were easier to discriminate than less typical faces, yet many gender discrimination studies neither measure nor control for the typicality of the stimuli. In addition, most previous research studies have presented unimodal visual stimuli and typically find gender discrimination at six to nine months of age. However, studies which have presented bimodal audiovisual events have typically found gender discrimination at earlier ages (four to six months). These conflicting results may be due to differences in the modality (unimodal, bimodal) of stimulus presentation or the typicality of the faces used as stimuli.

Synchronous bimodal audiovisual presentations are likely to enhance detection of gender, as this type of stimulation elicits heightened attention and perceptual processing as compared with unimodal displays (Bahrick, Lickliter, Flom, 2004). In addition, young infants are sensitive to invariant audiovisual relations specifying gender, such as the relation between the pitch of the voice and the size of the features (e.g., lower pitch correlates with larger features; Walker-Andrews, Bahrick, Raglioni, Diaz, 1991).

Research Question

The present study examined six-month-old infants' discrimination of gender under unimodal visual speech and bimodal audiovisual speech conditions, using only highly typical faces. It was predicted that infants in the bimodal audiovisual condition, but not the unimodal visual condition, would discriminate gender.

Methods

Thirty-two six-month-old infants were tested in an infant-controlled habituation procedure. Half of the infants ($n=16$, $M=187.51$ days, $SD=5.15$) were presented with dynamic, silently speaking faces (unimodal visual), while the other half ($n=16$, $M=188.94$ days, $SD=4.30$) were presented with dynamic faces speaking with synchronized voices (bimodal audiovisual). Infants viewed a series of six faces of a single gender (e.g., six male faces), each presented for seven seconds, until habituation was reached. Following habituations, two types of test trials were presented: novel faces from the familiar category (e.g., male faces) and novel faces from the novel category (e.g., female faces).

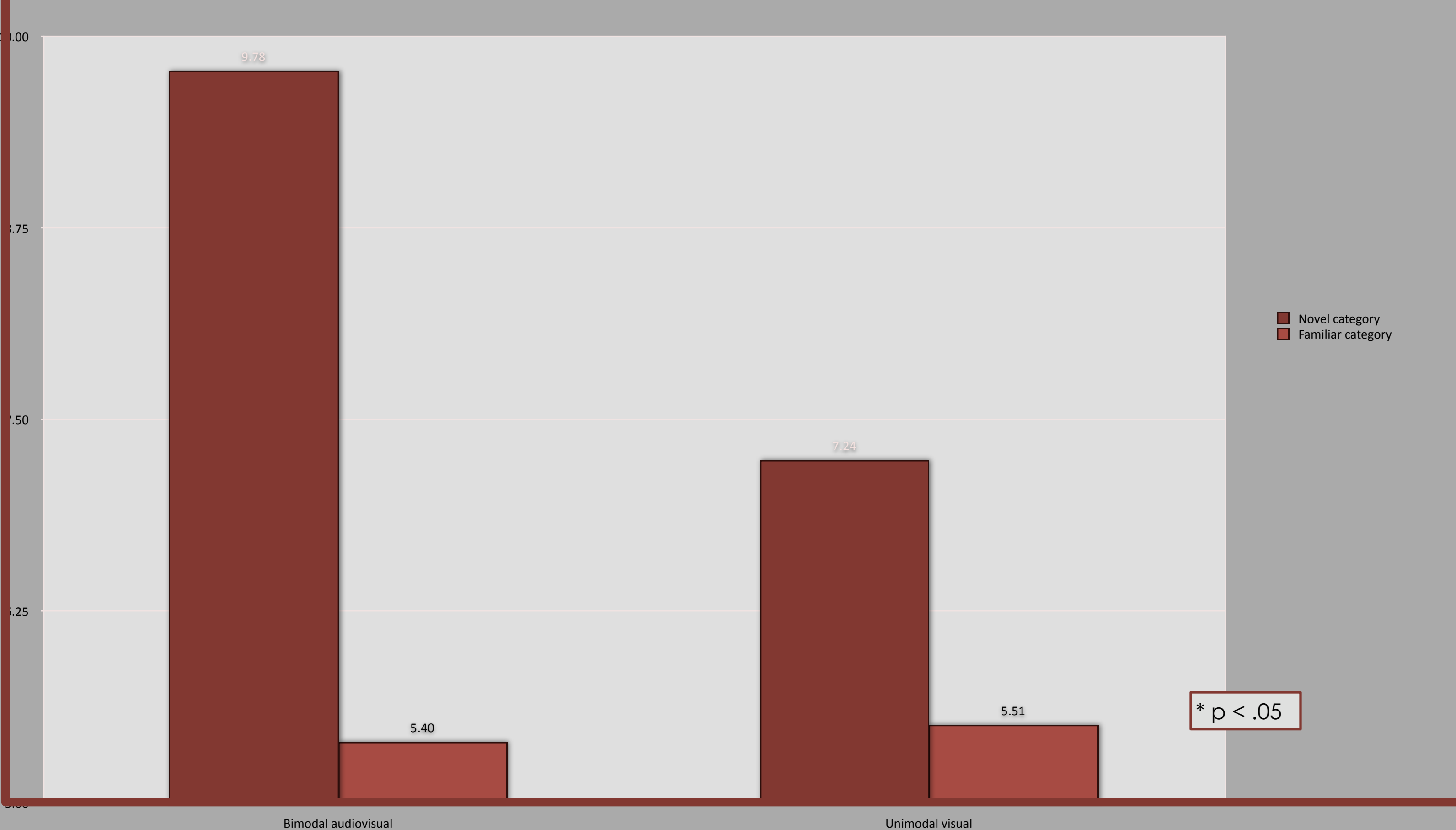


Still image representations of the dynamic video stimuli

Results

The average duration of looking during the two types of test trials (novel category, familiar category) was calculated. The difference between the novel category and the familiar category (i.e., novelty preference) served as the dependent variable. Consistent with our hypothesis, infants who received **bimodal, audiovisual stimulation** showed significant visual recovery to the novel gender (as compared to the familiar gender; $t(15)=2.87$, $p<.05$), whereas infants who received **unimodal visual stimulation** showed no evidence of visual recovery to the novel gender ($t(15)=1.20$, $p>.10$).

Visual Recovery (sec) to Novel and Familiar Gender Category



Conclusions

These findings suggest that bimodal audiovisual stimulation facilitates gender discrimination as compared with unimodal visual stimulation. It is not yet known whether this advantage is due to the heightened attentional salience of bimodal, synchronous stimulation, the availability of audiovisual invariants specifying gender, or whether infants are simply benefiting from the additional information provided by the voice. Future studies will compare asynchronous or bimodal, sequential presentations with synchronous presentations to help clarify the possible mechanisms underlying intermodal facilitation of gender discrimination.

References

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