



The influence of social context on 4-month-olds' categorization of infant-directed speech

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Abstract

The present study explored the impact of social context on 4-month-olds' (n=53) categorization of approving and comforting infant-directed speech (IDS). Four-month-olds heard either approving or comforting IDS during an infant-controlled habituation procedure while viewing one of 3 visual stimuli: a female face, male face, or scrambled face. Faces and a scrambled face were used to test the hypothesis that faces impact infants' processing of IDS. The female face was used as in the original study (Spence et al., 2004). A male static face condition preserves social context, while a scrambled female face condition maintains the features of the face, but removes both social and familiarity factors.

Preliminary analyses indicate that infants in the female face condition are categorizing IDS when habituated to comforting utterances. Infants in the scrambled face condition are not categorizing IDS. This suggests that the novelty or lack of social context of the scrambled face affected infants' perception of the speech stimuli. Infants in the male face condition did not categorize in either the approving or comforting condition, which is consistent with other reports that infants have more difficulty processing male than female faces. These findings have implications for understanding how visual stimuli impact infants' processing of infant-directed speech.

Introduction

Infant-directed speech (IDS) may communicate speakers' affect and emotion to infants:

- Adults vary IDS prosody as a function of context & intent

- (Fernald, 1992; Papousek et al., 1991; Stern et al., 1982)

- IDS regulates infant affect & behavior

- (Cooper & Aslin, 1990; Fernald, 1993; Pegg et al., 1992)

Previous studies have found that 6-month-olds, but not 4-month-olds, categorized approving and comforting IDS heard while viewing a nonsocial, checkerboard stimulus

- (Moore, Spence, & Katz, 1997; Spence & Moore, 2003)

BUT 4-month-olds categorized IDS while viewing a female face

- (Spence, Chuang, & Sokolsky, 2004)

Why does the face aid in IDS processing?

- Face facilitates infant processing of vocal affect

- The face serves as a "setting for attending to the affective quality of the voice"

- (Walker-Andrews & Lennon, 1991, p. 140)

- Faces and voices may need to be paired to allow infants to discriminate vocal expressions

- (D'Entemont & Muir, 1999)

Maybe the social context of faces facilitates categorization of infant-directed speech.

Purpose

This experiment tested if the social context of the face aided four-month-olds' categorization of approving and comforting IDS.

- During the categorization task:

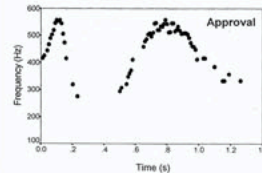
- Infants first habituated to multiple stimuli from one IDS category

- Presented one facial stimulus that accompanied vocal stimuli.

- Infants tested with 2 novel IDS stimuli from familiarized category followed by 2 IDS stimuli from novel category

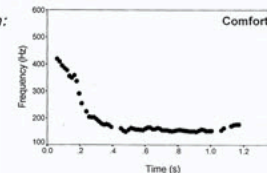
Methods

Approving ID speech:



- High mean F0
- High mean F0 variability
- Bell-shaped frequency contours

Comforting ID speech:



- Low mean F0
- Low F0 variability
- Falling frequency contours

Participants

- N=53
- Mean age: 125 days (98-149 days)
- 27 males, 26 females

Auditory Stimuli

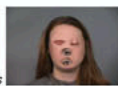
- Categorization task: 8 approving & 8 comforting IDS stimuli
- Stimuli produced by multiple talkers
- See Moore, Spence, & Katz, 1997 for detailed information

Visual Stimuli

- Each infant received one of 3 facial stimuli.
- Facial stimulus was presented along with auditory stimuli contingent on infant looking.

Procedure:

- Habituated to approvals or comforts
- Infant controlled procedure: 6-21 habituation trials
- Habituation criterion: 3 consecutive trials decreased 50% below 1st 3 trials of habituation
- (Habit 2000; Cohen, Atkinson & Chaput, 2000)
- Four test trials:
 - Within-category test trials: 2 novel IDS stimuli from the familiar IDS category
 - Between-category test trials: 2 IDS stimuli from the novel IDS category



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Results

ANOVA:

- Trial Block (Last Habituation, Within-Category Test Trials, Between-Category Test Trials) x IDS Condition (Approval, Comfort) x Facial Stimuli Condition (Female, Scrambled, or Male)
- Dependent measure: Mean fixation time
- No main effects or interactions

Planned Pair-Wise Comparisons:

Female Face: N=19

- Approval Condition (N=10)
- No significant differences

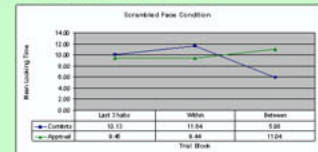
- Comfort Condition (N=9)

- Within Category Tests & Between Category Tests: $M_{diff} = -3.33, SE = 1.52, p = .059$



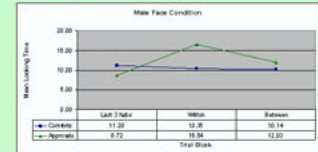
Scrambled Face: N=16

- No significant differences



Male Face: N=18

- No significant differences



Discussion

Asymmetrical categorization in female condition due to more variability in approval stimuli than comfort stimuli.

- (Quinn, 2002)

4-month-olds' processing of male and scrambled faces differs from female face processing.

- Infants' facial prototype is more "female."

- (Ramsey, Langlois & Marti, 2005)

- Scrambled faces do not provide perceptual information specific to faces, and are not seen as a "face."

- (Turati, Valenza, Leo & Simion, 2005)

Data collection is ongoing, but social context of female face seems to be facilitating infants' categorization.