Abstract

The Effects of Familiarity, Infant-Directedness, and Modality on Six-month-olds’ Visual Scanning of Talking Faces

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Background

1. Familiarity: Familiar (mother) vs. Unfamiliar (stranger) face and voice
Infants’ face and voice recognition of mother develops early.6,7

2. Infant-directedness: infant-directed (ID) vs. adult-directed (AD)
Acoustic and visual differences in ID vs. AD speech and faces8,9

3. Modality: dynamic vs. static, audio vs. silent
Static face is less ecologically valid than dynamic stimuli11

6-month-olds’ mouth preference predicts future language skills2, yet studies report inconsistencies in eye vs. mouth preference3,8,10,14

Three factors varied across studies but were controlled here:

1. Familiarity: Familiar (mother) vs. Unfamiliar (stranger) face
Infants’ face and voice recognition of mother develops early6,7

2. Infant-directedness: infant-directed (ID) vs. adult-directed (AD)
Acoustic and visual differences in ID vs. AD speech and faces8,9

3. Modality: dynamic vs. static, audio vs. silent
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Method

Stimuli:
- Six 10-s clips of ID and AD stimuli
- Video-only (VO): Silent dynamic video
- Audio-only (AO): Static face with audio
- Audiovisual (AV): Audiovisual dynamic video

Method

Participants:
- 6-month-olds (n = 42, M = 177 days, 24 males), Tobii T60 XL eye tracker
- Familiar group (FAM): viewed mother’s 6 stimuli in random order
- Unfamiliar group (UNFAM): viewed stranger’s stimuli (matched by mother’s race and infant gender)

Hypotheses for Specific Modalities

H1 VO: Within silent dynamic videos, Mouth preference for FAM ID face
H2 AO: Within static face with audio, Eye preference for all static faces
H3 AV: Within audiovisual videos, Mouth preference for FAM ID face

Analyses & Results

- Mean proportion of total looking time (PTLT) to Eye and Mouth AOIs entered into mixed repeated-measures ANOVAs:
  - Across modalities: Familiarity x Infant-directedness x Modality x Gender x AOI
  - Within modality (H1, H2, H3): Familiarity x Infant-directedness x Gender x AOI

- Across modalities: Effects of Modality and Familiarity
  - Modality x AOI, p < .001, ηp² = .51
    - Mouth preference on AV and VO
  - Eye preference for all audio-only static stimuli

- H1 not supported: No interaction of Familiarity x Infant-directedness
  - Main effect of AOI, p < .001, ηp² = .27
    - Mouth > Eyes
  - Familiarity x Infant-directedness x AOI, p = .826

- H2 supported: Eye preference for all audio-only static stimuli
  - Main effect of AOI, p < .015, ηp² = .15
    - Eyes > Mouth

- H3 not supported: No interaction of Familiarity x Infant-directedness
  - Main effect of AOI, p < .003, ηp² = .21
    - Mouth > Eyes
  - Main effect of Infant-directedness, p = .023, ηp² = .13
    - Greater attention to ID eyes and mouth than AD eyes and mouth
  - Familiarity x Infant-directedness x AOI, p = .414

- Post-hoc exploratory analysis: Interaction of Familiarity x AOI
  - Above analyses did not support expected interaction of FAM x Infant-directedness x AOI
  - Initial attention to faces may differ from sustained attention, as infant orients to stimulus15
  - Mean PTLT to first 2.5 seconds15 entered into across- and within-modality ANOVAs
    - Only one significant effect/interaction differed from 10 analyses

Discussion

Stimulus modality, not familiarity nor infant-directedness, guided 6-month-old's mouth vs. eye preference
- Dynamic mouth of video-only and audiovisual stimuli elicited mouth preference, not static mouth paired with audio
- Mouth movement elicits attention, regardless of speech signal
- Visual modality provides important communicative information for 6-month-olds, e.g. language discrimination13

Static stimuli hinders ecological validity of scanning data
- Eye preference may be related to unexpected stillness
- Static face may elicit still-face response, given reduced attention to AOIs of mothers’ vs. strangers’ static stimuli

Initial vs. sustained attention to faces may depend on face familiarity
- Mothers’ familiarity may streamline attention to mouth, while unfamiliarity triggers broader scanning of facial features.

References & Acknowledgments

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