

Adults' Interpretation of Meaningful Infant-Directed Facial Speech: TODALLAS Implications for Infants' Categorization Abilities

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Introduction

This study explored the visual component of infant-directed (ID) speech, or the facial movements portrayed by adults while speaking to infants, also called the *infant-directed face* (ID face).

Background

- ID speech is used by adults to modulate infants' affect, attention, and to facilitate language learning (Fernald, 1992).
- Different melodic properties characterize adults' messages (Fernald, 1989); six-month-olds categorize the acoustic signal (Spence & Moore, 2003).
 - Approving ID speech: "Good girl!"
 - Comforting ID speech: "Don't cry, baby."
- Less is known about the visual signal provided by the ID face.
- Mothers portray specific facial expressions when communicating with their infants (Chong et al., 2003).
 - But, what were the mothers communicating to their infants?
 - And, how did their facial movements vary as a function of the message?

Research Question

How do adults' facial movements vary as a function of the message communicated by infant-directed speech (e.g., approving, comforting)?

Hypotheses

Approving ID facial speech will portray head nodding; raised eyebrows; wide, smiling eyes; smiling lips; greater teeth visibility.

Comforting ID facial speech will portray head shaking side-to-side; furrowed eyebrows; sad eyes; rounded or frowning lips.

Method

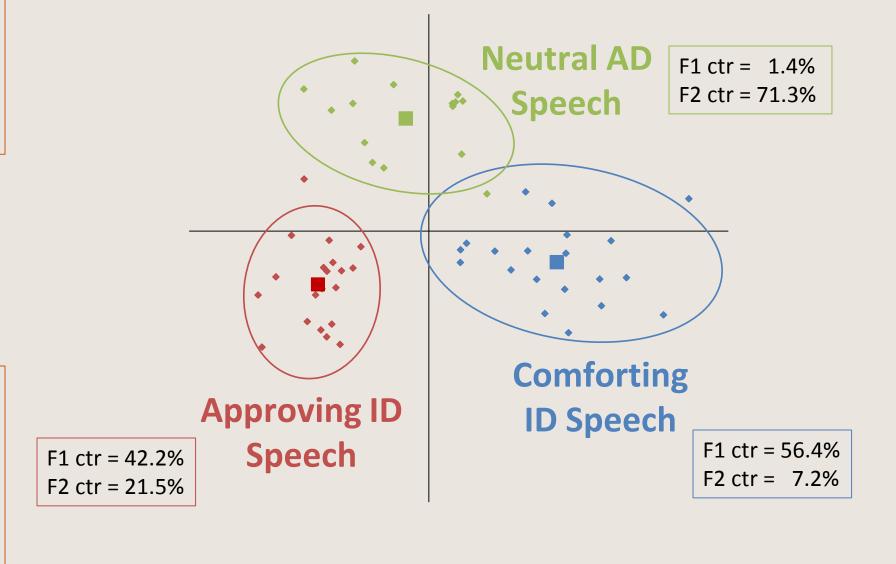
- 3 adult raters coded silent facial speech videos:
 - 20 Approving ID speech (*M* = 2.07 s, *SD* = 0.53)
 - 20 Comforting ID speech (*M* = 2.05 s, *SD* = 0.52)
 - 15 Neutral adult-directed (AD) speech (M = 3.11 s, SD = 0.64)
- Facial Speech Coding Scale (FSCS):
 - 6 facial regions; 35 characteristics
 - Developed for coding video stimuli with facial speech
 - Example:

	Eyebrows	Neutral	✓	Neutral eyebrows				
		Raised	√ _	Slightly raised	>	Raised	√ + Very raised	
		Furrowed	√ -	Slightly furrowed	✓	Furrowed	✓ + Very furrowed	
		Moving	✓_	Slightly moving	✓	Moving	✓+ Much movement	

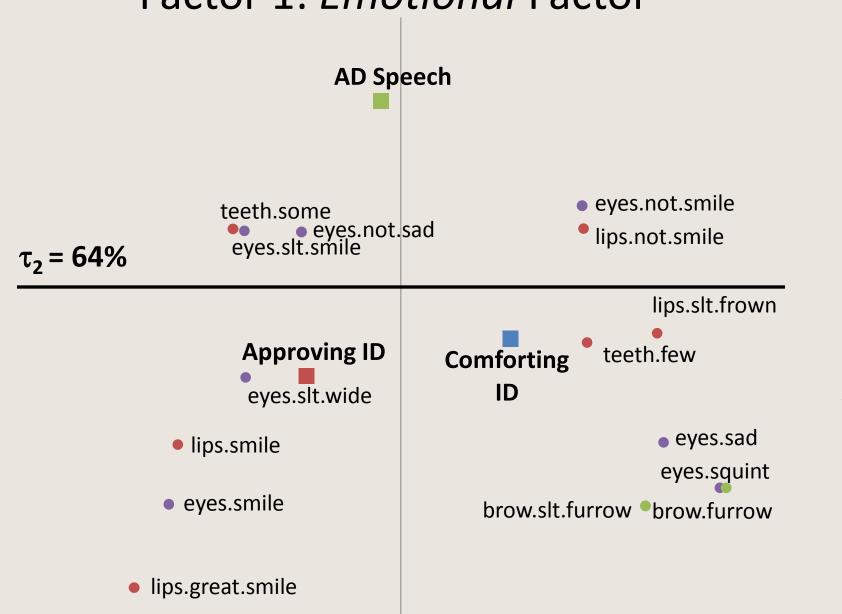
- Discriminant Correspondence Analysis (DiCA; Abdi, 2007)
 - Analyzes group variability in qualitative data

Results

DiCA of Facial Speech Ratings



Factor 1: Emotional Factor



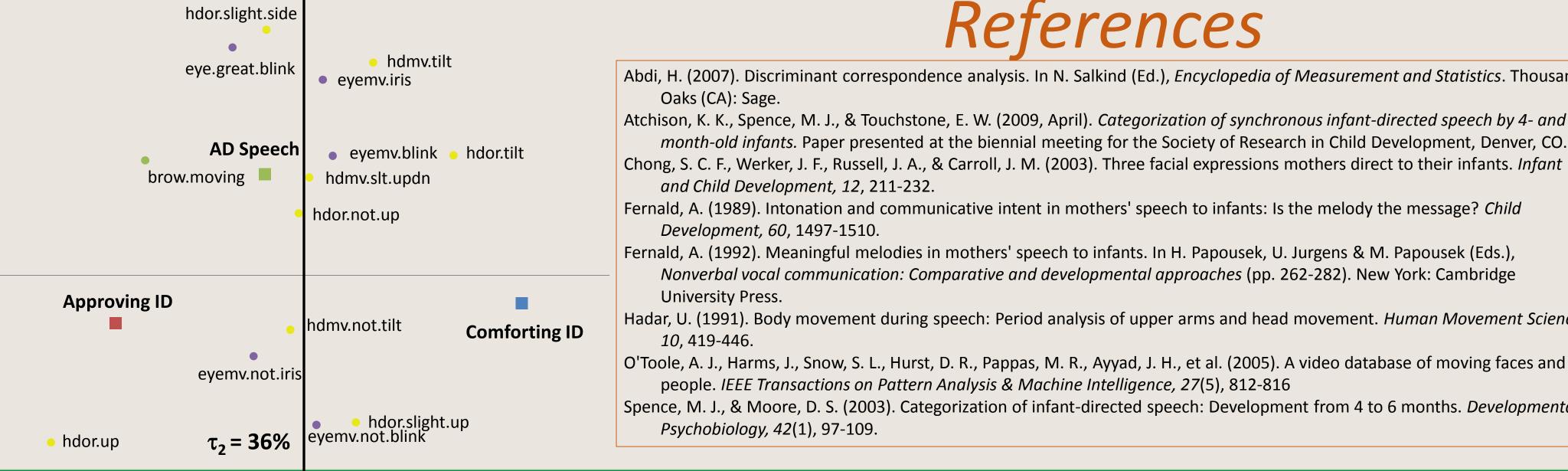
Fixed-Effect Model: DiCA assignment of videos within the sample to the a priori groups.

	Actual Group				
Assigned Group	Approving ID	Comforting ID	AD Speech		
Approving ID	20	0	0		
Comforting ID	0	20	1		
AD Speech	0	0	14		

Random-Effect Model: DiCA assignment of new videos to the a priori groups.

	Actual Group				
Assigned Group	Approving ID	Comforting ID	AD Speech		
Approving ID	19	2	3		
Comforting ID	0	17	1		
AD Speech	1	1	11		

Factor 2: Movement Factor



Discussion

- Emotional factor differentiated Approving ID from Comforting ID speech.
 - Approving: smiling eyes, smiling lips
 - Comforting: sad eyes, frowning lips
- Movement factor differentiated AD speech from ID speech videos.
 - AD videos: greater eye and head movement
 - ID videos: less eye and head movement
- Live vs. video stimulus collection.
 - AD speakers spoke during live adult interaction.
 - ID speakers spoke to a video of infants.
- Positive correlation between speech rate and head movement (Hadar, 1991).
 - AD speech is faster than ID speech (e.g., Fernald, 1989).
- Hypotheses supported for brows, eyes, lips, teeth.
 - But not for head movement.

Conclusions

Adults' approving and comforting ID speech messages are differentiated by specific facial movements.

- Supports previous findings that naïve adults perceived the intended recipient and speech message in the silent videos.
- Suggests there are visual cues available during speech to support infants' prelinguistic perception of caregivers' communicative messages.

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