

Developmental Change in Preschoolers' Sensitivity to Pitch as a Cue to the Speaker's Emotions

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Motivation

We investigate children's use of intonation to infer a speaker's emotions, as a way of better understanding how children begin to assign clearly discriminable phonetic variation to different levels of structure. Despite the demonstrated early importance of prosody in infancy (Fernald, 1993), prosodic cues to emotions appear to be exploited late in development (Friend, 2003). Using a naturalistic task without conflict between cues, we investigate when English-learning children exploit pitch as a cue to emotions (when other acoustic cues are controlled).

Participants

Experiment One: 38 3- to 5-year-olds
Experiment Two: 42 2- to 5-year-olds

Predictions

Hypothesis I: Consistent with the early importance of pitch for other communicative functions, the pitch cue to emotions should be exploited early.

Hypothesis II: Inferring another person's emotions is difficult, so the pitch cue to emotions may be exploited much later than pitch cues to phrase boundaries, rhythmic class, etc.

Experiment One

Puppy searches for a toy (e.g., the *Toma*) on each trial. He is excited when he finds the *Toma*, and disappointed when he finds a different toy.

Task: Give Puppy the *Toma*, throw the other toys in the trash.

Trials 1-3: body-language cue

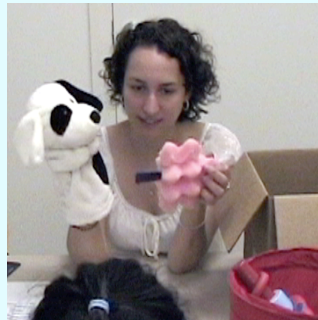
Toy 1 Not *Toma* Puppy shakes head, slumps
Toy 2 *Toma* Puppy nods, dances
Toy 3 Not *Toma* Puppy shakes head, slumps

Trials 4-7: pitch cue

Toy 1 Not *Toma* Low, flat pitch (on "Mmm")
Toy 2 *Toma* High pitch, wide excursions
Toy 3 Not *Toma* Low, flat pitch

(Order counterbalanced.)

Puppy covers Experimenter's face in all trials.)



Experiment Two

Remove the word-learning component.
Make the task more directly about emotions.

Puppy searches for his (unnamed) lost toy on each trial.

Task: If Puppy is happy, point to the happy face.
If Puppy is sad, point to the sad face.

Condition 1: body-language / facial cues

Toy 1 Not lost toy Experimenter frowns, she & Puppy slump
Toy 2 Lost toy Experimenter smiles, she & Puppy dance

Condition 2: pitch cue

Toy 1 Not lost toy Low, flat pitch (on "Oh, look at that")
Toy 2 Lost toy High pitch, wide excursions

(Order counterbalanced.)

Puppy covers Experimenter's face in Condition 2.)



Conclusions

Children still struggle to exploit the pitch cue to emotions until age 4. We found this in a naturalistic, simple task in the absence of conflicting cues.

This suggests that pitch cues to different levels of structure are available at different points in development. Since two- and three-year-olds successfully use the body-language cue, we know they understand the underlying emotions and can succeed in the task. Instead, it is mapping the pitch contours onto those emotions that proves difficult.

Related Research

Fernald, A. (1993). Approval and disapproval: Infant responsiveness to vocal affect in familiar and unfamiliar languages. *Child Development*, 64, 657-674.

Friend, M. (2003). What should I do? Behavior regulation by language and paralinguistic in early childhood. *Journal of Cognition and Development*, 4, 161-183.

Morton, J. B., & Trehub, S. E. (2001). Children's understanding of emotion in speech. *Child Development*, 72, 834-843.

Contact

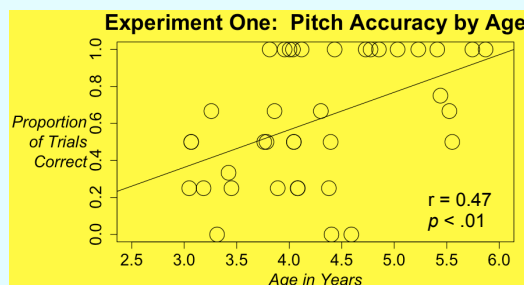
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Proportion of Children At Least 66.7% Correct				
Age (years)	3	4	5	
Body-lang.	11/14 (79%)	16/16 (100%)	8/8 (100%)	
Pitch	4/14 (29%)	8/16 (50%)	7/8 (88%)	



Proportion of Children At Least 66.7% Correct				
Age (years)	2	3	4	5
Body-lang.	4/4 (100%)	5/6 (83%)		
Pitch	0/1 (0%)	4/10 (40%)	7/11 (64%)	8/10 (80%)

