

Paul Corthals (a),(b) Language and gender effects in the

Phonetics of Parentese

^a University College Ghent, Belgium

^b Ghent University, Belgium

^c University of Virginia, USA

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L. Depester, J. De Vis (b)

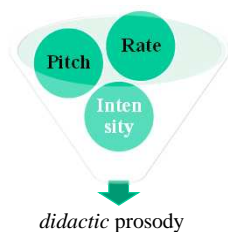
N. Gabriel, A. Gibson, A. Larrabure, K. A. Rhodes (c)

A. Barnes, J. Corena, E. Price, E. Rippon, E. Sutphin, K. Wolfe (c)

Filip Loncke (c)

INTRODUCTION

Parentese is the speech-language register adults switch to when talking to children. It uses a limited vocabulary, short repeated utterances, and referents that are concrete and present. Acoustic-phonetic analyses show hyper-articulated vowels, slower speech and articulation rate, raised voice pitch, exaggerated intonation, and pre-boundary vowel lengthening. Parentese probably regulates infant arousal and attention and communicates affect, but it is also thought to facilitate language learning because its linguistic complexity is tuned to children's language development stages and its segment-marking prosody can act as a disambiguating factor. Interestingly, these features are also known to assist language-delayed children and second-language learners.



This study further documents the "didactic prosody" of child-directed speech in English and Dutch, and offers a male-female comparison of parentese speakers.

Research Questions

Is the prosody of Dutch and English parentese identical?
Are there male and female parentese sub-styles?

METHOD PARTICIPANTS & RECORDINGS

10 female and 7 male native speakers of Flemish Dutch and 9 female and 5 male native speakers of American English (i.e. 19 female and 12 male participants, mean ages 36 yrs. and 37 yrs.) were audio-recorded during dyadic sessions with their child and with one of the investigators. Children were typically developing (between 5 and 28 months; American children were younger). Digital recordings were made in each subject's home. For adult-to-adult samples, participants were encouraged to respond to unscripted questions. They were then asked to verbally interact with their child using a book or toy for the adult-to-child recordings.

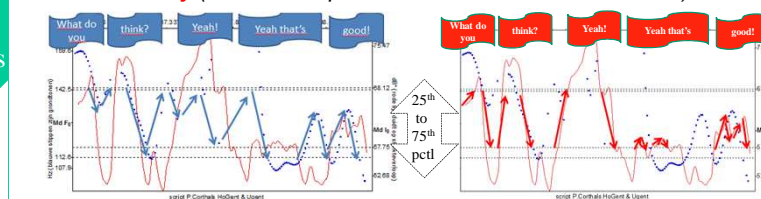
METHOD PROCEDURES

an-notation

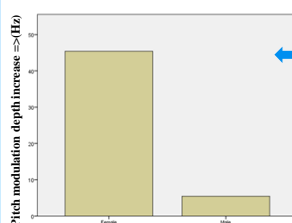
• Praat software (Boersma & Weenink 2009) was used to identify relevant fragments in the recordings. Praat scripts were used to retrieve parameters for:

- **Speech rate** (words & syllables per unit of time)
- **Voice pitch** (median, extent and speed of the intonation maneuvers)
- **Voice intensity** (extent and speed of the voice stress maneuvers)

analysis



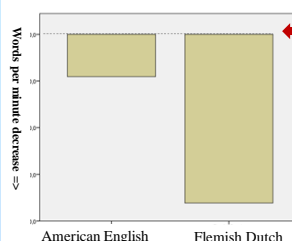
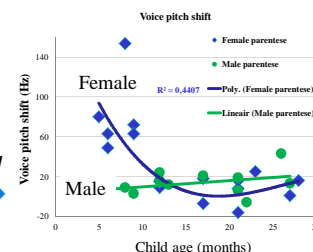
SIGNIFICANT EFFECTS



Gender effects

(left) In child-directed speech, female speakers exaggerate intonation (interquartile range of F_0) significantly more than males (T test $p < 0.001$)

Voice pitch seems to be tuned to the child's age only in female parentese (right)

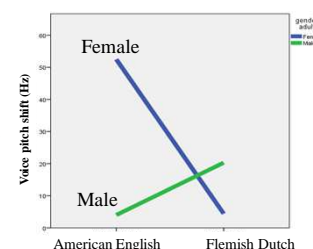


Language effect

Speech rate was reduced more in Flemish parentese (T test $p < 0.01$)

Language-Gender interaction

Female American English parentese speakers raised their voice pitch significantly more (2x2 ANOVA $p < 0.05$)



CONCLUSIONS

In both languages parentese has gender-specific features in that pitch modulations were significantly larger in female speakers. Moreover, median voice pitch seems to be tuned to the child's age in female parentese only. Lower speech rates in Flemish Dutch and the language-gender interaction (larger voice pitch shift in female speakers of American English) may be due to the younger age of the American children. When addressing young infants, voice pitch is an obvious feature to regulate arousal and to communicate affect, whereas a lower speech rate is better to convey information to older children, who begin to comprehend verbal messages.

Contact Dr. Paul Corthals, paul.corthals@hogent.be

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Bibliographic references

- Boersma, P. & Weenink, D. (2004). PRAAT [computer software]. Institute of Phonetics, Amsterdam.
- Endress, A.D. & Hauser, M.D. (2010). Word segmentation with universal prosodic cues. *Cognitive Psychology*, 61, 177-199.
- Fernald, A. (1989). Intonation and communicative intent in mothers' speech to infants: is the melody the message? *Child Development*, 60, 1497-1510.
- Fernald, A., Taeschner, T., Dunn, J., Papousek, M., de Boysson-Bardies, B. & Fukui, I. (1989). A cross-language study of prosodic modifications in mothers' and fathers' speech to preverbal infants. *Journal of Child Language*, 16, 477-501.
- Fisher, C. & Tokura, H. (1996). Acoustic cues to grammatical structure in infant-directed speech: cross-linguistic evidence. *Child Development*, 67, 3192-3218.
- Fourakis, M. (1991). Tempo, stress, and vowel reduction in American English. *Journal of the Acoustical Society of America*, 90, 1816-1827.
- Grieser, D.L. & Kuhl, P.K. (1988). Maternal speech to infants in a tonal language: support for universal prosodic features in motherese. *Developmental Psychology*, 24, 14-20.
- Höhle, B., Bijeljac-Babic, R., Herolda, B., Weissenborn, J. & Nazzi, T. (2009). Language specific prosodic preferences during the first half year of life: evidence from German and French infants. *Infant Behavior & Development*, 32, 262-274.
- Jusczyk, P.W. & Houston, D.M. (1999). The beginnings of word segmentation in English-learning infants. *Cognitive Psychology*, 39, 159-207.
- Kooijman, V., Hagoort, P. & Cutler, A. (2009). Prosodic structure in early word segmentation: ERP evidence from Dutch ten-month-olds. *Infancy*, 14, 591-612.
- Kuhl, P.K., Conboy, B.T., Coffey-Corina, S., Padden, D., Rivera-Gaxiola, M. & Nelson, T. (2008). Phonetic learning as a pathway to language: new data and native language magnet theory expanded (NLM-e). *Philosophical Transactions of the Royal Society B*, 363, 979-1000.
- Liu, H-M., Tsao, F-M. & Kuhl, P.K. (2009). Age-related changes in acoustic modifications of Mandarin Maternal speech to preverbal infants and five-year-old children: a longitudinal study. *Journal of Child Language*, 26, 909-922.
- Nazzi, T., Kemler Nelson, D.G., Jusczyk, P.W. & Jusczyk, A.M. (2000). Six-month-olds detection of clauses embedded in continuous speech: effects of prosodic well-formedness. *Infancy*, 1, 123-147.
- Payne, E., Post, B., Astruc, L., Prieto, P. & Vanrell, M. (2010). A cross-linguistic study of prosodic lengthening in child-directed speech. In: *Speech Prosody 2010*, 11-14 May 2010, Chicago.
- Seidl, A. (2007). Infants' use and weighting of prosodic cues in clause segmentation. *Journal of Memory and Language*, 57, 24-48.
- Shi, R., Morgan, J.L. & Allopena, P. (1998). Phonological and acoustic bases for earliest grammatical category assignment: a cross-linguistic perspective. *Journal of Child Language*, 25, 169-201.
- Shute, B. & Wheldall, K. (1999). Fundamental frequency and temporal modifications in the speech of british fathers to their Children. *Educational Psychology*, 19, 221-233.
- Soderstrom, M. (2007). Beyond babytalk: re-evaluating the nature and content of speech input to preverbal infants. *Developmental Review*, 27, 501-532.
- Soderstrom, M., Seidl, A., Kemler Nelson, D.G., & Jusczyk, P.W. (2003). The prosodic bootstrapping of phrases: evidence from prelinguistic infants. *Journal of Memory and Language*, 49, 249-267.
- Thiessen, E.D. & Saffran, J.R. (2003). When Cues Collide: Use of Stress and Statistical Cues to Word Boundaries by 7- to 9-Month-Old Infants. *Developmental Psychology*, 39, 706-716
- Warren-Leubecker, A. & Bohannon, J.N. (1984). Intonation patterns in child-directed speech: mother-father differences. *Child Development*, 55, 1379-1385.