

Can British-English Learning Infants Segment Words from Italian?



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Background

Infants track transitional probabilities (TPs) in speech, an ability argued to support native-language segmentation

- E.g., *American-English 8-month-olds familiarised to Italian containing manipulated TPs*
- Tested using the *head turn preference procedure (HTPP)*
- Listened longer to *high-TP (HTP) over low-TP (LTP) words* Pelucchi et al., 2009

Research Aim

Replicate Pelucchi (2009) with infants learning British English

Methods

Participants

- 8-month-old infants (N=26)
- 12 male, 14 female, M =8;14 (8;2 -9;1)
- No prior exposure to Spanish, Italian, Portuguese



The Language

- 12 Naturally spoken Italian sentences
- Equally frequent target words

6x HTP words TP=1.00

fuga, melo

Syllables only occur in these words

Spesso Lisa capita in *fuga* nella *casa* dove giaci gracile e tesa. Se cadi con la *bici* prima del bivio del *melo* cavo.

6x LTP words TP= 0.33

casa, bici

Syllables occur 3 times as often

Procedure

- Single Screen Eye automated tracking (ET) – preferential looking

Familiarisation Phase: 12 sentences played 3 times

2.5 minutes, star moves contingent on looking – mimicking test phase

Test Phase: 12 Test Trials

Hear 6xHTP 6xLTP words played in isolation

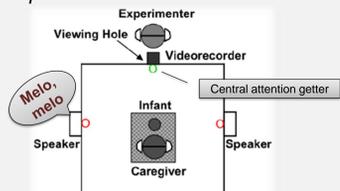
Central attention getter

Side star 15s or until 2s look away

Central attention getter

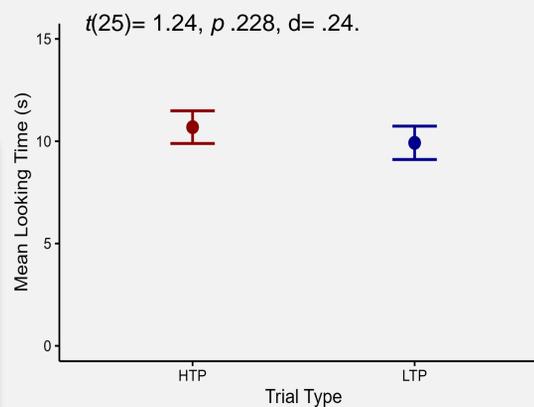
Side star

Pelucchi, 2009: HTPP-comparison



Results

1. Pre-Registered Replication Analysis



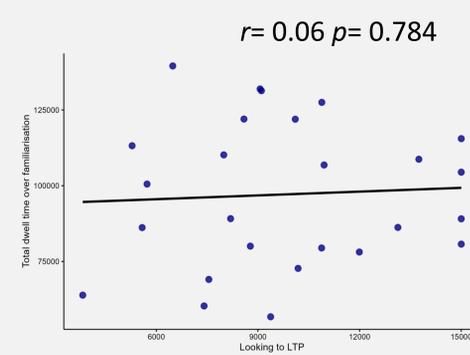
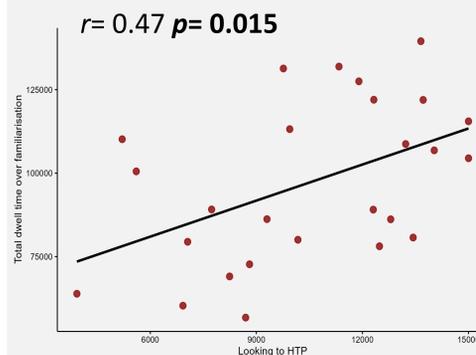
Error bars represent $\pm 1 SE$

Infants looked longer to **HTP** (M=10.48s, SE=.62) over **LTP** (M= 9.80s, SE=.64).
No significant difference

Pelucchi, 2009:
HTP (M=8.75 seconds, SE=.31)
LTP (M=7.71 seconds, SE=.36).
 $t(31)=3.94, p < .001^*, d = .55$

2. Exploratory Analysis: Engagement with familiarisation during ET and looking at test

- Longer looking over familiarisation correlates with longer looking to **HTP** but not **LTP** words at test
- Some evidence greater engagement led to learning of HTP words



3. Reliability of Methods- ET vs HTPP: Intraclass Correlations (ICC)

- Test whether failure to replicate main findings is due to difference in methods
- Estimates how consistent participants' looking was for trials of the same type: HTP and LTP

ET		
ICC(HTP) 95% CIs	ICC(LTP) 95% CIs	Reliability (HTP/LTP)
0.74 [0.55-0.98]	0.79 [0.79-0.90]	Moderate/Good

Greater measurement reliability across same-type trials than HTPP

Pelucchi, 2009: HTPP		
ICC(HTP) 95% CIs	ICC(LTP) 95% CIs	Reliability (HTP/LTP)
0.43 [0.06-0.69]	0.14 [-0.42- 0.53]	Poor/Poor



Conclusions

- British-English infants may segment using TPs but ET may not fully capture this
- ET reliably measures looking time but less sensitive to relative preference than HTPP (less motor demands= weaker effects)
- Greater engagement over familiarisation during ET may lead to better HTP learning
- Thus, consider sensitivity and measures of engagement when using ET
- Alternatively, dialectal differences (American vs British English) may influence Italian processing
- Replicating foundational studies with other samples/methods is needed to test generalisability

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References: Pelucchi, B., Hay, J.F., & Saffran, J.R. (2009). Statistical Learning in a Natural Language by 8-month-old infants. *Child Development*, 80, 674-85