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The importance of language experience in the mutual exclusivity bias

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Introduction

- Mutual exclusivity (ME) – tendency to map novel labels onto novel objects (Markman & Wachtel, 1988)
- Between 17 and 22 months for monolingual infants (Halberda, 2003; Mather & Plunkett, 2009)
- One-to-one mapping between items and labels
  - Not appropriate for multilingual infants as each item can have at least two labels
- Inconsistent evidence for bilingual infants' use of ME
  - Marginal use with a trend towards significance (Byers-Heinlein & Werker, 2009)
  - No evidence of use (Houston-Price, Caloghiris & Raviglione, 2010)
  - Only bilinguals with smaller proportion of translation equivalent showed ME (Byers-Heinlein & Werker, 2013)

Methods

Participants:

- Twenty-two 22-to-26-month-old bilingual infants
  - Exposed to English and one other language
- Twenty-six 22-to-26-month-old monolingual infants

Stimuli:

- Parents completed the Oxford Communicative Development Inventory (OCDI) or a bilingual adaptation
- Based on the OCDI, 12 words were selected:

Bilinguals	Monolinguals
Four words known only in English	Six known words
Four words known only in the other language	Six unknown words
Four words known in both languages	

- For bilingual infants, two novel and two familiar targets for each trial type
- For monolingual infants, three novel and three familiar targets for both trial types
- 48 trials with four repetitions of each trial

- Eye-tracking – Tobii Tx300
  - Proportion of time spent looking at the target pre- and post-naming

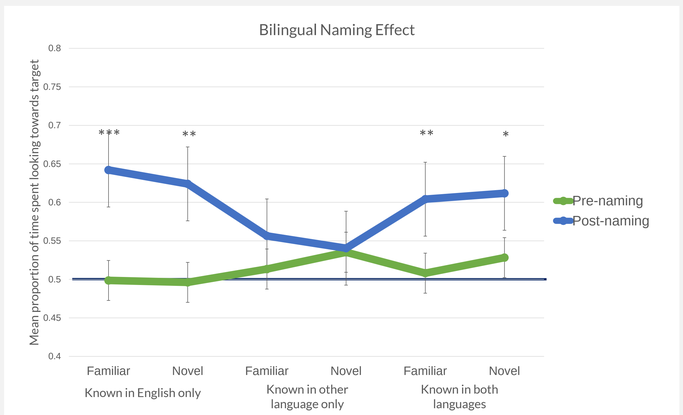
Bilingual infants show the **mutual exclusivity bias** if they know the familiar item in:

☑ **English**

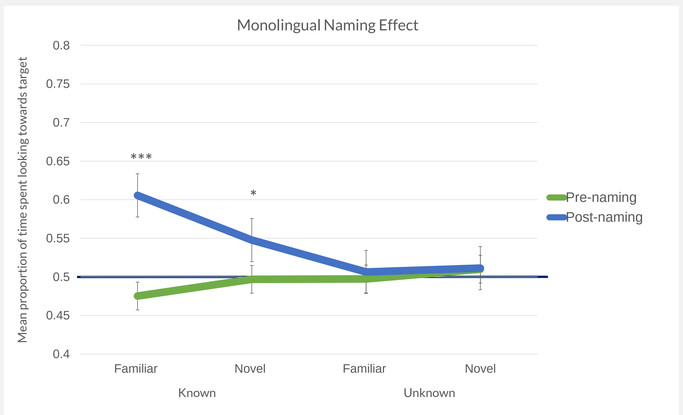
☑ **Both languages**

☒ Other language

Results



- Bilingual participants demonstrated ME if the familiar item was known in English, $t(21) = 3.96$, $p = .001$, $d = .85$, 95% CI[.06, .19], or in both languages, $t(21) = 2.51$, $p = .020$, $d = .54$, 95% CI[.02, .17].
- Participants did not demonstrate ME if the familiar item was only known in their other language, $t(21) = .102$, $p = .919$, $d = .02$, 95% CI[-.10, .11].



- Participants demonstrated ME if the familiar item was known, $t(25) = 2.15$, $p = .041$, $d = .41$, 95% CI[.002, .100], but not if this item was unknown, $t(25) = .06$, $p = .957$, $d = .01$, 95% CI[-.05, .05].

Discussion

- Whilst previous research has found that bilingual infants demonstrate marginal-to-no-use of the mutual exclusivity bias, this study has found bilingual infants to demonstrate ME in particular contexts:
  - Bilingual infants showed ME if the familiar item was known in English or both languages, but not if this was only known in the other languages
- Suggests the importance of considering the specific vocabulary used in ME research
- Lack of ME on familiar in other language trials could be explained by the carrier phrase being presented in English.
- Monolingual infants were found to demonstrate ME on trials in which the familiar item was known, but not unknown
  - This supports the assumption that ME is dependent upon knowledge of the familiar item label
  - Performance on familiar target trials across language groups support the accuracy of the OCDI and its potential utility as a bilingual vocabulary measurement

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