Bilingual Infants Show No Evidence of Mutual Exclusivity at 18 - 21 Months

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Look at the dax!

Background

How do children discover the meaning of each new word they hear? Their behaviour reveals that they are 'constrained' or 'biased' to consider only a subset of all logically-possible hypotheses about each new word's meaning (e.g. Clark, 1991; Golinkoff, Mervis & Hirsh-Pasek, 1994; Landau, Smith & Jones, 1998; Macnamara, 1982; Markman, 1989, 1991; Markman & Wachtel, 1988; Merriman & Bowman, 1989; Mervis & Bertrand, 1994).

An example of such constraints is children's tendency to select an unfamiliar object as the referent of a new word (henceforth 'mutually exclusive' behaviour or 'ME'). If preschoolers are shown a familiar object (e.g. a cup) and an unfamiliar object (e.g. a hole punch) and are asked to "Give me the dax!", they will select the object for which they do not have a name (Merriman & Bowman, 1989; Mervis & Bertrand, 1994).

Halberda (2003) found ME behaviour to emerge by the middle of the second year. In a preferential looking study, infants of 17 months (but not 14 or 16 months) increased their attention towards an unfamiliar object, relative to a familiar object, when they heard a novel word.

There are several accounts of the mechanism underlying ME. For example, children may be unwilling to allow one referent (e.g. a cup) to have two names (both 'cup' & 'dax') (Mutual Exclusivity Hypothesis; Markman & Wachtel, 1988) or they may not allow two words ('cup' & 'dax') to have exactly the same meaning (Principle of Contrast; Clark, 1987).

Aims of Study

This study examines whether ME behaviour is a learned strategy, acquired through children's experiences of how words are used.

Infants raised in monolingual and bilingual environments have very different experiences of how words are used, and therefore provide an ideal opportunity to explore this question.

For example, monolingual infants might develop an ME strategy because they only ever experience referents being given single labels, or because they do not know of two words with the same meaning. In contrast, bilingual infants will have many experiences of referents being given two labels, and of two words having the same meaning.

Therefore, if the ME strategy is learned through experience, bilingual infants should not develop the bias alongside their monolingual peers.

However, if ME is an innately-guided principle, monolingual & bilingual infants should develop the strategy at approximately similar ages.

Method

Participants: 31 monolingual infants (English only)
23 bilingual infants (English + Other language)

Monolingual and bilingual infants were matched on:
age (mean = 20 ms, range = 17 – 22 ms)
English receptive vocabulary (mean = 122 words)

Bilingual infants had equal numbers of words in their two languages, 75% of which were translation equivalents. Other languages were diverse, including Afrikaans, Arabic, Czech, Dutch, French, German, Gujarati, Mandarin, Portuguese, Slovak, Spanish, Tagalog & Twi.

Procedure: Infants saw 24 trials in preferential looking study

There were 3 types of trial:

KK trials (Known Target – Known Distracter)

Find that cup!

KU trials (Known Target – Unknown Distracter)

Look at the car!

UK trials (Unknown Target – Known Distracter)

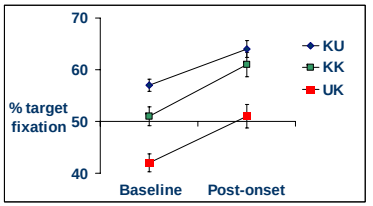
Where is the dax!

Trial duration was 7,000 ms, with onset of the target word at 3,500 ms.

Results

3-way interaction between group (mono vs. bilingual), trial type (known vs. unknown) & onset of word (pre- vs. post-): $F(1,48) = 5.52$, $p=.023$, $\eta^2=.10$

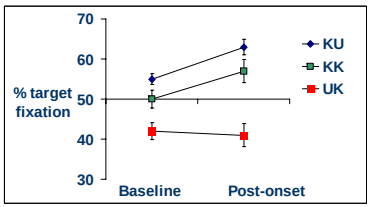
Monolingual Infants:



KK trials: $t(29)=5.49$, $p<.001$
KU trials, $t(29)=2.52$, $p=.01$
UK trials, $t(29)=3.73$, $p=.001$

Monolingual infants showed that they were using ME on UK trials by increasing their fixation of the unknown item on hearing 'dax'. Infants' % increase in target fixation on UK trials was positively correlated with their vocabulary size, $r(29) = .33$, $p=.04$, suggesting that language experience plays a role in the development of the strategy.

Bilingual Infants:



KK trials: $t(19) = 3.13$, $p=.006$
KU trials: $t(19) = 2.45$, $p=.024$
UK trials: $t(19) = .50$, $p=.62$

Bilingual infants showed no use of an ME strategy on UK trials. There was no evidence of strategy development with age or vocabulary size.

Conclusions

ME behaviour is acquired through infants' experience of language. Given that bilingual infants do not develop the strategy alongside their monolingual peers, it is likely that the specific experience required for the strategy to appear is the monolingual child's experiences of single labels being used to name referents, and/or their experiences of no two words having exactly the same meaning.

For a reference list, please email c.houston-price@reading.ac.uk