The influence of children's communicative environments

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Outline:

- A timetable for getting into language
- How the environment affects this

Getting into language from birth

New-borns:

- Recognise the sounds and speech patterns of their mothers' voice
- Can tell the difference between the sound patterns of languages
- Can identify repeated patterns in a sound stream

1-5 months:

- Can tell the difference between different language sounds (e.g. *pa* and *ba*)

6-12 months:

increasingly sensitive to the prosody, phonemes, and vowels of their own language

Reference:
http://www.ircs.upenn.edu/pinkel/lectures/kuhl/

Talking to the baby: Infant directed speech

- **Wider pitch**
- **Greater prosodic patterning**
- **Repetitive**

- **Babies prefer to listen to it**
- **They find it easier to detect words and patterns in it**

Producing sounds

- **2-4 months:** cooing and laughter
- **4-7 months:** onset of vocal play sounds (squeals, yells, growls).
  - Some babies may start some very simple babbling.
- **7+ months:** start of "canonical" babbling –
  - strings of repeated syllables (*ba-ba-ba, da-da-da*) or mixture of syllables (*ba-da-ga*).

Interacting with the baby

Turn-taking

Baby talk

- Infants vocalise more when caregivers are interacting with them:
- When mothers were smiling and making eye contact, they produced more syllabic, speech-like vocalisations.
- Mothers who respond to the vocalisations of their infants with behaviours such as smiling and touching had infants who produced more advanced vocalisations.

➢ Babies become entrained into interactive communication with their caregivers.

References:

Hsu, H. C., & Fogel, A. (2001). Infant Vocal Development in a Dynamic Mother-Infant Communication System. *Infancy*, *2*(1), 87-109.

Goldstein, M. H., & Schwade, J. A. (2008). Social feedback to infants' babbling facilitates rapid phonological learning. *Psychological Science*, *19*(5), 515-523.

Early social interaction
https://www.youtube.com/watch?v=LxZxBU31z0c

Dyadic interaction: Little conversationalist
https://www.youtube.com/watch?v=7MTFATZaP_k

Learning words

- How do we know if a baby knows a word?
- Contexts of word learning
- How fast can they process words?

How do we know what a baby knows?

By seeing if they can tell the difference between two sounds

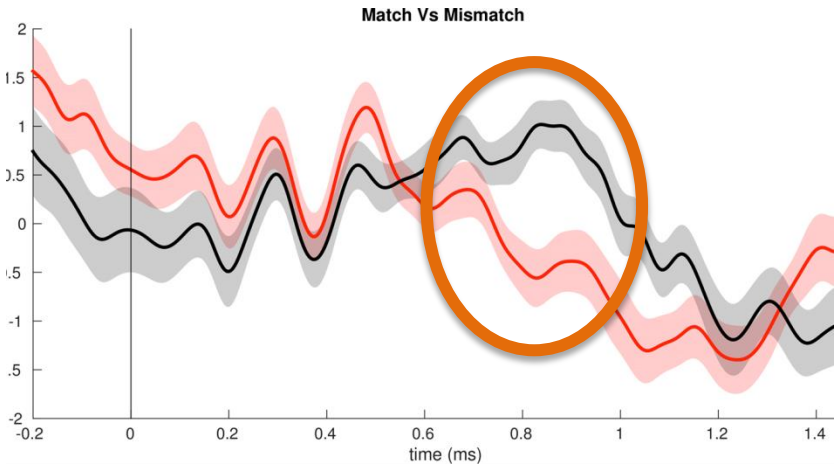
- **Bore them and then change what they hear**
- **Surprise them with an unexpected event**
- **See where they look**

Methods: EEG, Head-turn, Eye-tracking

Elecro Encephalo Gram (EEG)

Look a cow

Look a cat



Contexts

Crawling around on the floor

Linda Smith: APA Psy talk

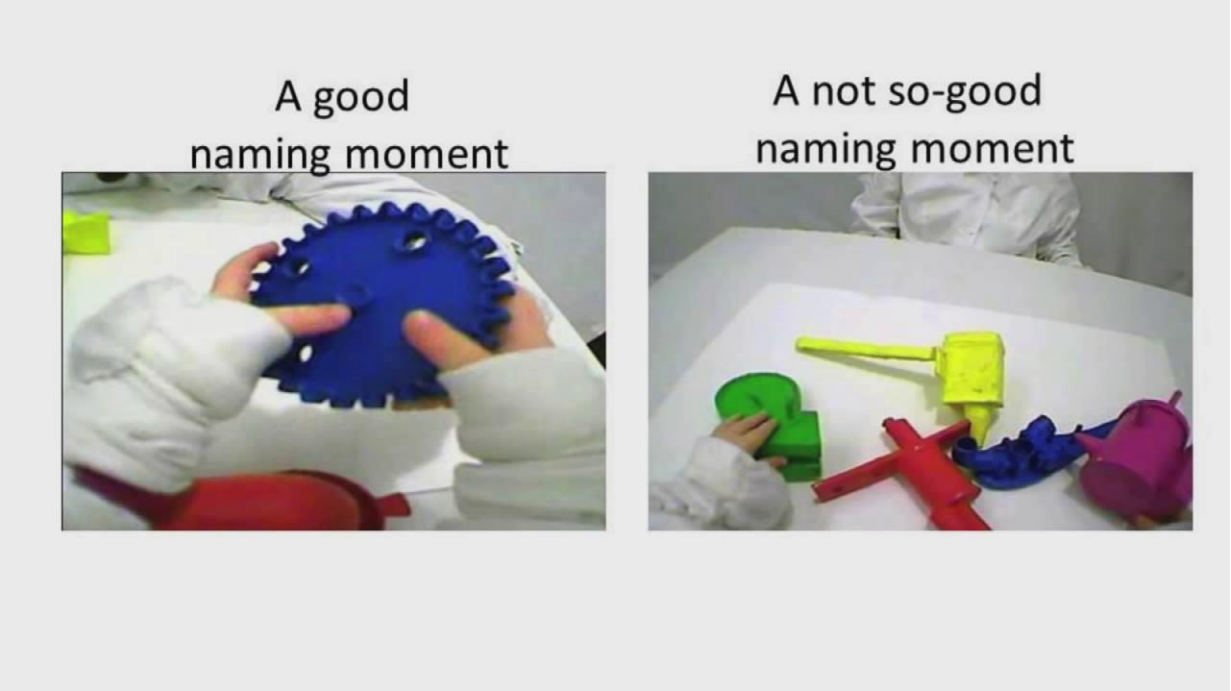
https://www.youtube.com/watch?v=yMyn8j8sMjA)

Sitting still with objects

Linda Smith: APA Psy talk

https://www.youtube.com/watch?v=yMyn8j8sMjA)

More or fewer objects?



[Linda Smith: APA Psy talk](https://www.youtube.com/watch?v=yMyn8j8sMjA)

Processing speed

Find the …….. *Dollie/(Doggie)*

12 months (after the end of the word)

15 months (at the end of the word)

24 months (at the first distinguishing sound)

➢ **The amount mothers talk to their 18-month old infants is related to these children's speed of word processing and vocabulary at 24 months.**

References:

Fernald, A., Pinto, J.P., Swingley, D., Weinberg, A., & McRoberts, G.W. (1998). Rapid gains in speed of verbal processing by infants in the 2nd year. *Psychological Science*, **9**, 228–231.

Hurtado, N., V. A. Marchman, and A. Fernald. 2008. Does input influence uptake? Links between maternal talk, processing speed and vocabulary size in Spanish-learning children. *Developmental Science*, **11** (6): F31–F39.

https://web.stanford.edu/group/langlearninglab/cgi-bin/

Infant communication

The '9-month revolution': Communicating with other minds

- Preverbal children start to communicate intentionally
- They start to behave as if others were communicating intentionally
- They show developing skills at reading other minds

↓

Beginning of understanding common ground

↓

Allows mapping of words to intentional meaning

References:
Tomasello, M., & Carpenter, M. (2007). Shared intentionality. *Developmental Science, 10*, 121-125.
Carpenter, M. (2014). Imitation (role of) in communicative development. In P. J. Brooks & V. Kempe (Eds.), *Encyclopedia of Language Development*. Thousand Oaks, CA: Sage.

Preverbal communication

Before they use words, babies communicate to:

- get things from people
- direct and share attention
- elicit an emotional response from others
- inform others

We can see this when we look at their reactions to different types of interaction

References:

Lizskowski, U., Carpenter, M., Henning, A., Striano, T., & Tomasello, M. (2004). 12-month-olds point to share attention and interest. *Developmental Science, 7,* 297-307.

Matthews, D., Behne, T., Lieven, E., & Tomasello, M. (2012). Origins of the human pointing gesture? A training study with 9- to 11-month olds. *Developmental Science*, *15*, 6, 817–829

Misunderstood

Uninterested

- Pointing – most babies by 12 months
- Offering objects: earlier?

An ongoing study in our Centre:

Laura Boundy

Thea Cameron-Faulkner

Anna Theakston

Reference:
Boundy, L., Cameron-Faulkner, T., & Theakston, A. (2016). Exploring early communicative behaviours: A fine-grained analysis of infant shows and gives. *Infant Behavior and Development*, *44*, 86-97.

When infants held out the toy, the experimenter provided a scripted response in one of four conditions.

Joint Attention: engaged with both toy and infant.

"Are you showing me the toy? That's fantastic!" "Wow you're good at shaking that toy!"

Toy Attention: engaged with toy only.

"This toy is red and grey and makes a good noise!" "Wow there's lots of colours and shapes!"

Infant Attention: engaged with infant only.

"You are doing a great job sitting in the highchair!" "Wow you're in a good mood today!"

Ignore: hold out ignored and non-contingent utterances used.

"I really must check my emails after this!" "Wow what lovely weather outside!"

Preliminary Results

- More positive expressions (smiling/laughing) in the *Joint Attention* condition compared to the three other conditions.
- More attempts to redirect the experimenter's attention and significantly more negative expressions in all three conditions which did not display joint attention.
- Less visual checking to the caregiver in the *Joint Attention* condition compared to the three other conditions.
- More vocalisation in the *Infant Attention* and *Ignore* condition.

Cross-cultural studies

Tzeltal (Mexico) , Rossel Island (Papua New Guinea)
Brown (2011)

Chintang (Nepal) and Bibberthal (Germany)
Lieven & Stoll (2012)

Peru, India and Canada
Callaghan et al. (2011)

This suggests that:

Babies are on an evolutionary timetable for
pointing, imitation, giving, showing, early comprehension

References:

Brown, P. (2011). The cultural organization of attention. In A. Duranti, E. Ochs, & B.B. Schieffelin (Eds.), *The handbook of language socialization* (pp. 29–55). Malden: Wiley-Blackwell.

Lieven, E. & Stoll, S. (2013) Early communicative development in two cultures. *Human Development,* 56:178–206, *DOI: 10.1159/000351073*

Callaghan, T., Moll, H., Rakoczy, H., Warneken, F., Liszkowski, U., Behne, T., & Tomasello, M. (2011). Early social cognition in three cultural contexts. *Monographs of the Society for Research in Child Development, 76,* 1–142.

So does this mean interaction doesn't matter?

NO!

No child is going to learn a language without hearing it

Dual Inheritance: Individual Inherits both
> biological timetable from evolution
> objects/practices/languages from culture

In typical development, this would not happen in isolation from a social and linguistic environment

Joint attention:

Paying attention to the same thing
and knowing that you are doing so

Predicts:

Vocabulary size in early language learning

Following in:

Following the child's focus of attention
and talking about it

Predicts:

Faster vocabulary development

References:

Tomasello, M. & Farrar, M. (1986), Joint attention and early language. *Child Development*, 57, 1454-1463.

McGillion, M. L., Herbert, J. S., Pine, J. M., Keren-Portnoy, T., Vihman, M. M., & Matthews, D. E. (2013). Supporting early vocabulary development: What sort of responsiveness matters?. *IEEE Transactions on Autonomous Mental Development*, *5*(3), 240-248.

Individual differences in number of words learned and heard

At 18 months:

Fastest children know 320 words

Slowest children know 4 words

Children in the USA: Using a language check list

Reference: http://wordbank.stanford.edu/

Arriaga, R., Fensen, L., Cronan, T., & Pethick, S. (1998). Scores on the MacArthur Communicative Development Inventory of children from low- and middle-income families. *Applied Psycholinguistics*, 19, 209-223.

At 12 months:

Children of the most talkative parents hear 36,000 words a day

Children of the least talkative parents hear 9,000 words a day

LuCiD 0-5 project: Recording the language round the children for 12 hours in one day

Other References:

Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Paul H Brookes Publishing.

Cartmill, E. A., Armstrong, B. F., Gleitman, L. R., Goldin-Meadow, S., Medina, T. N., & Trueswell, J. C. (2013). Quality of early parent input predicts child vocabulary 3 years later. *Proceedings of the National Academy of Sciences*, *110*(28), 11278-11283.

Why does word learning matter?

because it is related to later language development, school readiness and reading

300 children: 16 – 24 months
vocabulary assessed by parent report

Followed up about 5 years later
vocabulary and reading skills measured

- For the group: the early measures were significant predictors of later outcomes
- Family risk of language and literacy problems made predictions about reading outcomes more stable

Reference:
Duff, F. J., Reen, G., Plunkett, K., & Nation, K. (2015). Do infant vocabulary skills predict school-age language and literacy outcomes?. *Journal of Child Psychology and Psychiatry*, *56*(8), 848-856.

To finish…..

- **Babies are on a developmental timetable**
- **But there are major individual differences**
- **These are influenced by:**
  - **the ways in which we interact with babies**
  - **if and how we talk to them**
- **In turn, this affects the speed with which they learn words**
- **And this has major long-term effects on their subsequent development**

Particular thanks to …

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The end

Note: There are many resources on the LuCiD Website (see next slide), including a number of *Nursery World* Articles that summarise some of this research:

http://www.lucid.ac.uk/resources/for-practitioners/nursery-world-magazine/

Thank you!

LuCiD
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