Talk with me: Language development and the social environment: following children born this millennium

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Outline

- Newborns & Early dyadic interaction - ready to learn from interaction
- Transition to coordinating attention to the outside world - intentionally directing others attention to external interest – is this experience dependent?
- Transition to first words - does interaction predict this?
- Language and SES – which SES factors best predict language? Is the effect stable across development and generations?
- Discussion: what questions would you want to ask of this data set?
- Tiny Happy People: A new set of resources from BBC Education
- Discussion: what video content would you most like to see?
- Wrap up

Newborns & their caregivers :

- Immediately socially oriented –

Newborns: Pay attention to precisely those aspects of the social environment that help learn to communicate:

faces, voices, biological motion, contingency (Csibra, Gergely)

- **simple biases** (e.g., sensitivity to acoustic properties of primate vocalisations , to low spatial frequency components corresponding to the spatial arrangement of a face)

+ basic brain architecture => cortical specialisation (Johnson & de Haan)

- Possible evolutionary advantage in context of cooperative breeding (Hrdy, 2009)

Caregivers: Undergo significant adaptations upon arrival of an infant (mothers, fathers and non-biologically related caregivers. Feldman, 2015; Lorenz, 1950)

Dyadic phase - learning

Caregivers

- reply to vocalisations and involuntary emissions such as hiccups and burps as if they were conversational turns
- selectively respond to infants' most adultlike communication
- engage in family routines from which infants can reliably extract a pattern of activity that they can increasingly enter into and even initiate themselves

Infants

- engage in turn taking
- learn that vocalisations get a response – and seek to elicit such responses
- learn how sound conveys affect in language specific ways

Summary: Roots of communicative development

- Very young infants know when someone is with them – because that person is in physical contact with them but also because they produce self-relevant eye contact, vocalisations and contingent behaviour
- 0-4 months - communicative cues increasingly signal togetherness
- **Basis of communicative intentions?** When I communicate, I am doing so for you and seek (only) recognition/togetherness
- **Basis of informative intentions?** Bio-behaviorual synchrony, where the neonate and caregiver align behaviourally and physiologically resulting in commonly felt emotions, giving meaning to their communicative expressions – expressions are 'about' emotions

Matthews, D. (2020) Learning to communicate in infancy. In C. Rowland, A. Theakston, B. Ambridge & K. Twomey. *How children use their environment to learn: New perspectives on child language acquisition.* (pp. 11-37) Amsterdam: John Benjamins.

Outline: pragmatic stages in infancy

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Gaze coordination

- Study of 134 11-months-olds **above chance** in coordinating vocalisations and gestures with gaze
- Gaze coordinated acts more likely to elicit response from caregiver
- Alongside other experimental evidence for gestures (Liszkowski et al 2004; Boundy et al 2019) and analyses of naturalistic vocal communication (D'odorico; Esteve-Gibert & Prieto, 2012) suggests emerging intentional control over use of vocalization and gesture to direct attention
- Is this development dependent on experiencing interaction?

Donnellan, Bannard, McGillion, Slocombe, Matthews, 2020, *Developmental Science*

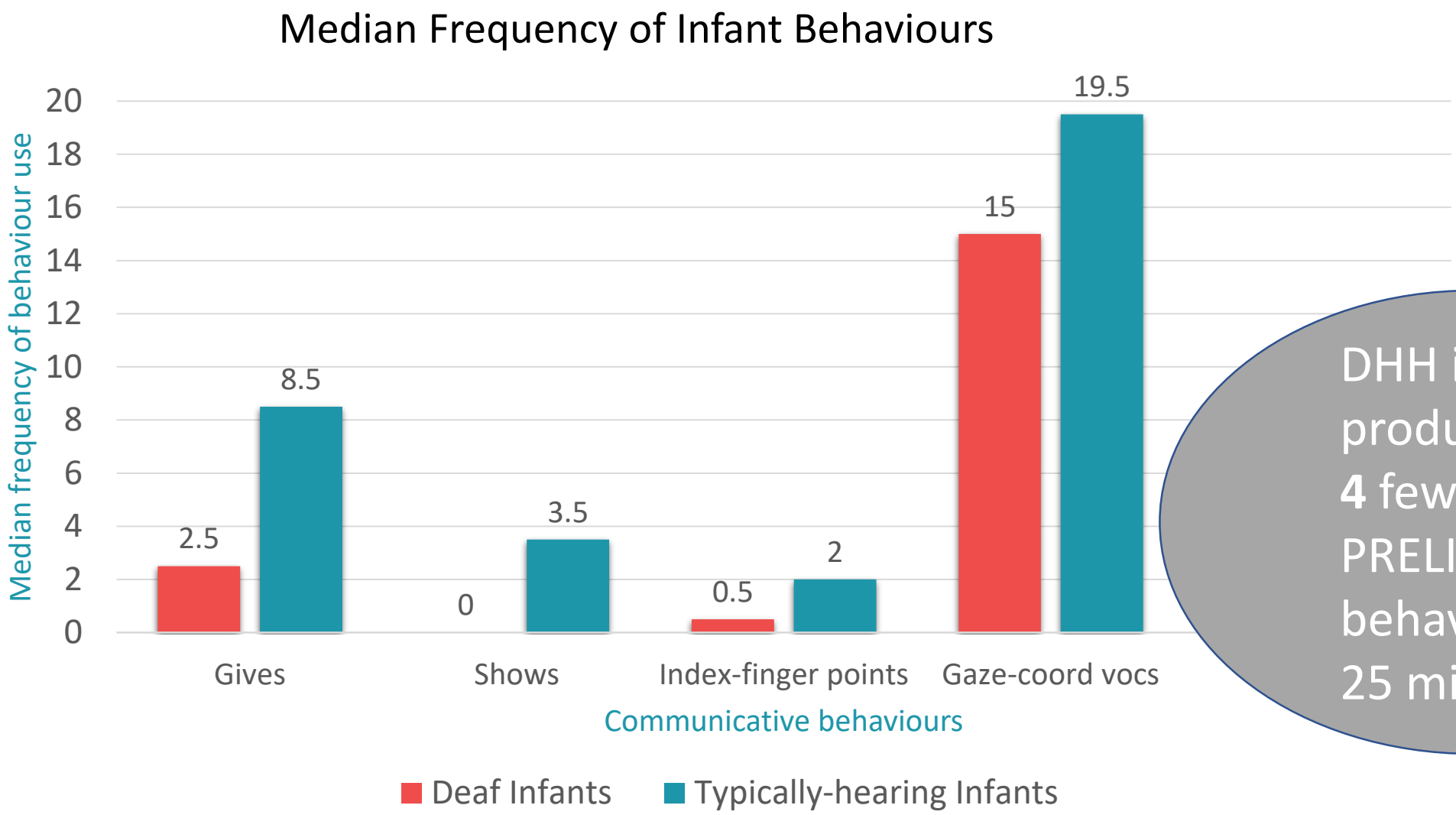
The role of experience: Deaf Infants

- 95% deaf infants have hearing parents
- High variability in way dyads manage to interact communicatively
- Deaf infants with deaf parents learn to look to their parent more
- Hearing parents often struggle to support joint attention (Lederberg)
- Delay in pre-linguistic communicative development both vocal and gestural (Kelly, Bannard, Morgan & Matthews, 2020)

The role of experience: Deaf Infants

- Why would deaf infants be at risk of such a pre-linguistic delay?
- Hearing parents often intuitively rely on the auditory modality during interaction
  → not just for speech but also to use non-linguistic vocal cues (e.g., gasps) in **temporal synchrony** with their actions as a mechanism to focus infant attention and regulate interaction
  → If gasps etc are not accessible to a deaf infant, joint attention can break down easily (makes it harder to learn about communication)

Ciara Kelly



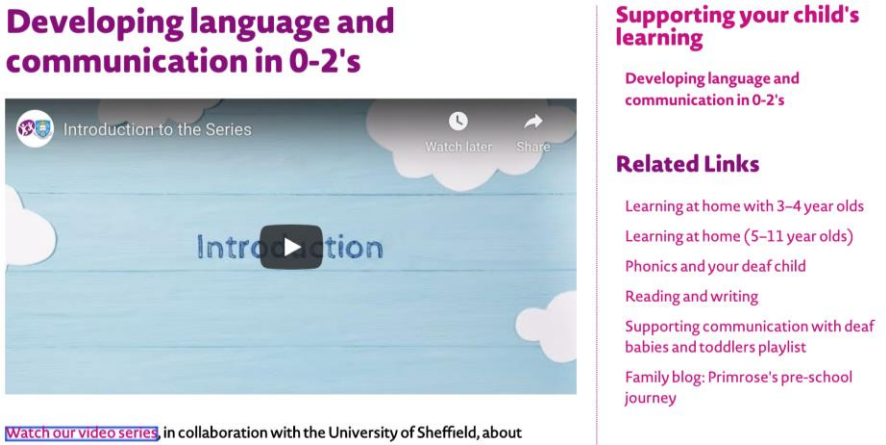
DHH infants produced **4** fewer PRELINGUISTIC behaviours in 25 mins play

Kelly C., Morgan G., Bannard C., & Matthews D. (2020). *Pediatrics.*

The role of experience: Deaf Infants

- Lack of access to sound can disrupt dyadic interaction and reduce the frequency with which infants engage in **intentional, triadic pre-linguistic communication**
- Less opportunity for caregivers to respond in a way that further scaffolds **language** development
- Follow up study suggests that video-based support materials can help in harmony with professional guidance:

www.ndcs.org.uk/information-and-support/language-and-communication/supporting-your-childs-learning/developing-language-and-communication-in-0-2s/



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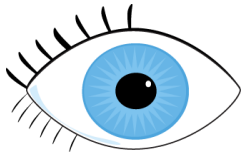
Transition to conventional language

- Liz Bates, Mike Tomasello: intentionally communicative prelinguistic acts are the foundation stone for transition to conventional language
- If so, then gaze coordinated vocalisations and gestures should predict word use over the 2nd year

The origins of word use

Gesture

Gaze co-ordination

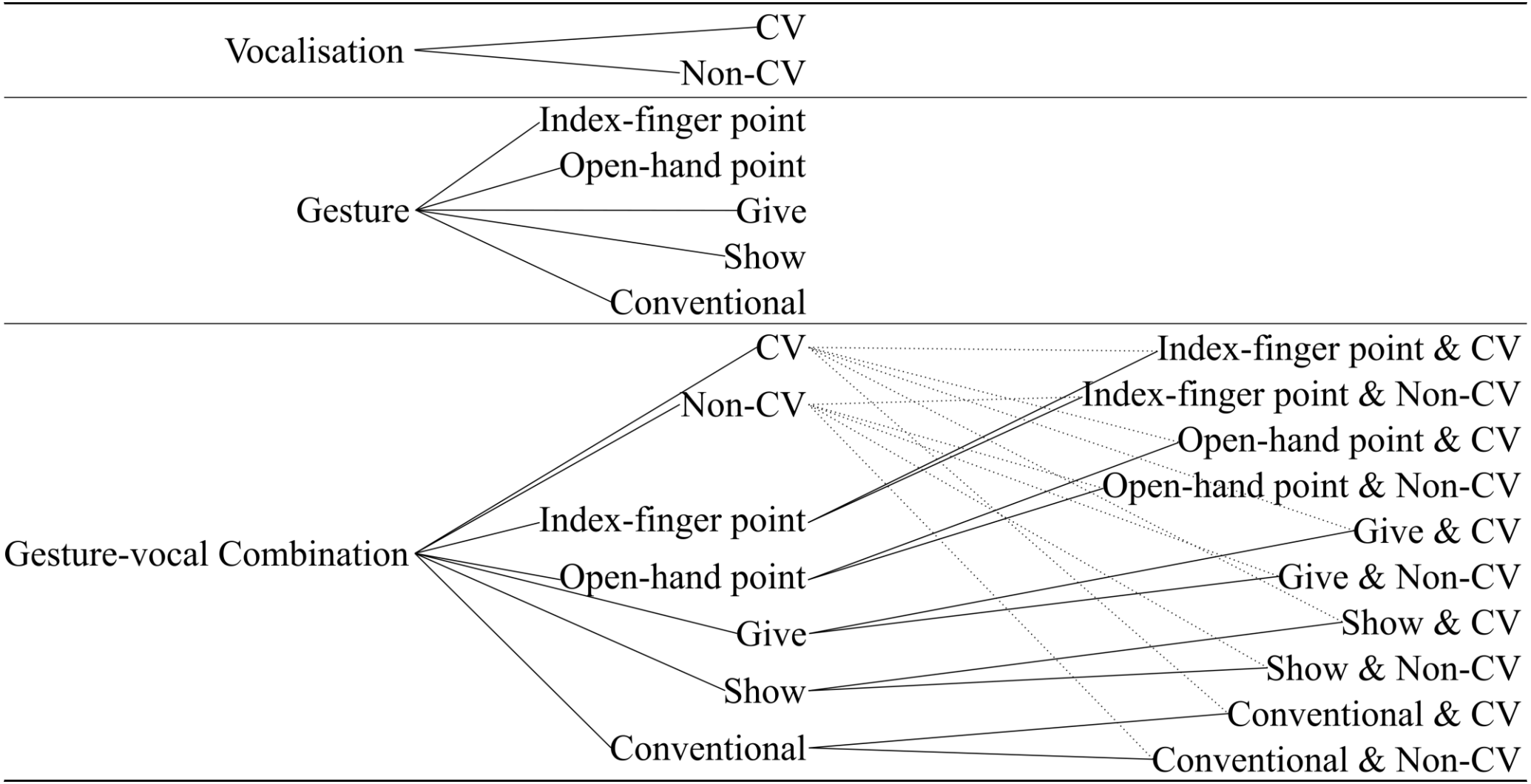


Vocalisation

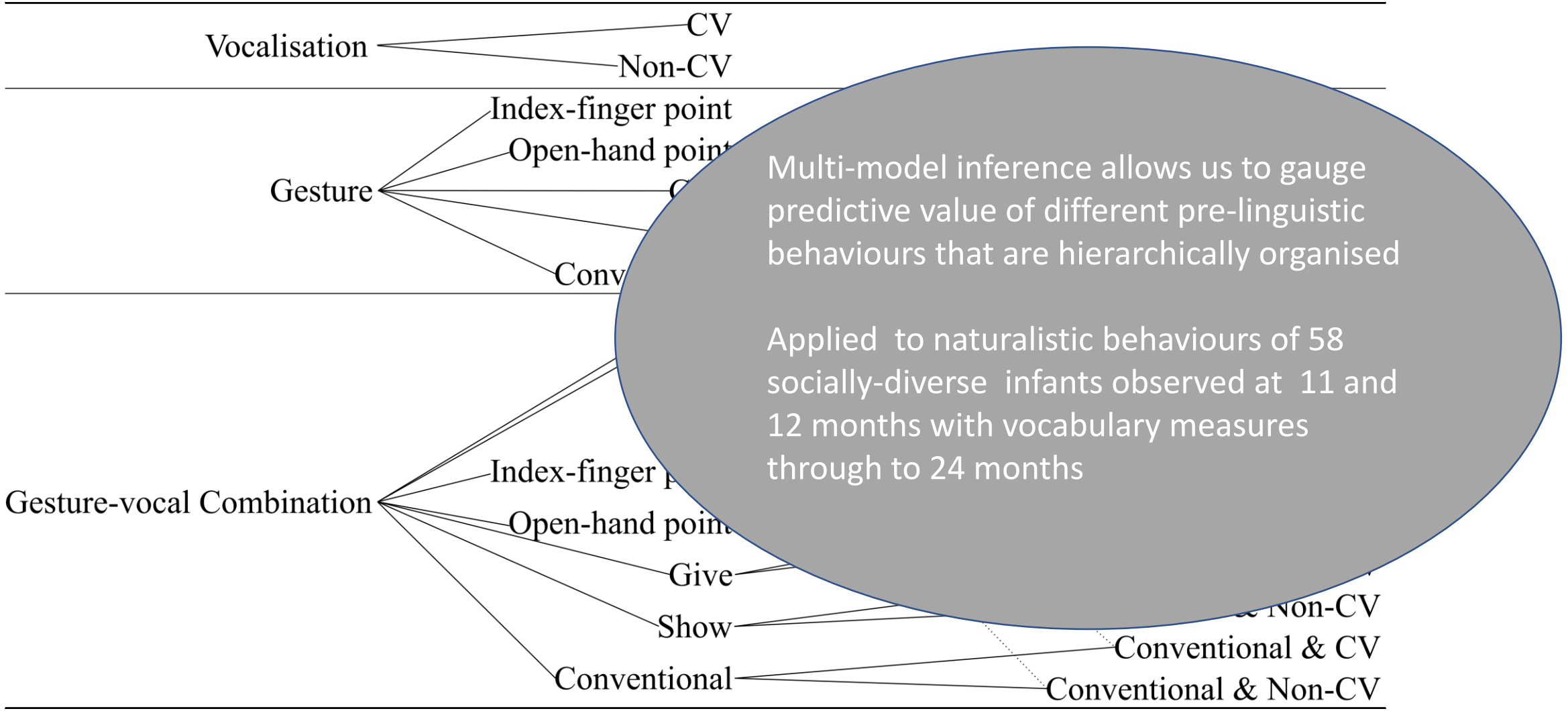
Caregiver interaction

Conventional Language

Intentional communication predicts transition to language (individual differences study)



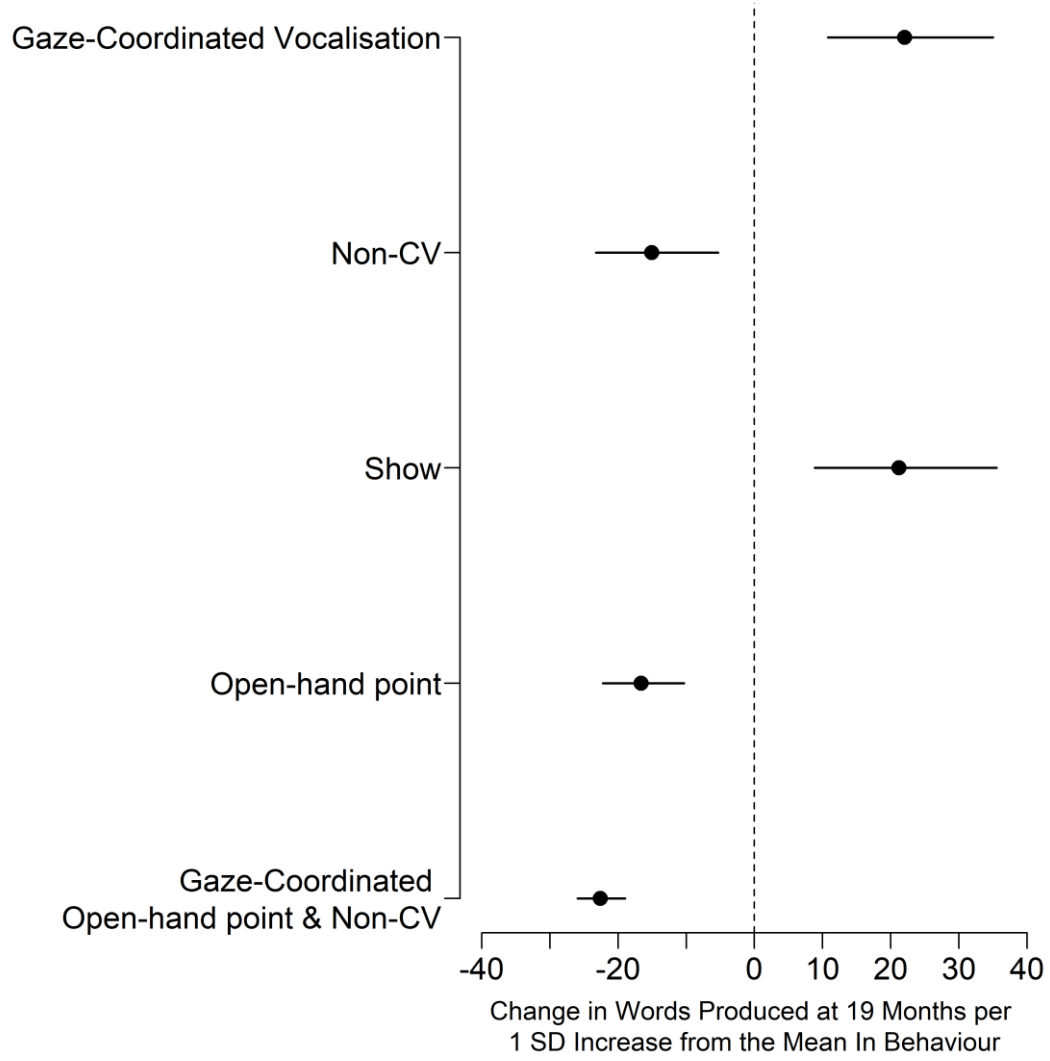
Intentional communication predicts transition to language



Multi-model inference allows us to gauge predictive value of different pre-linguistic behaviours that are hierarchically organised

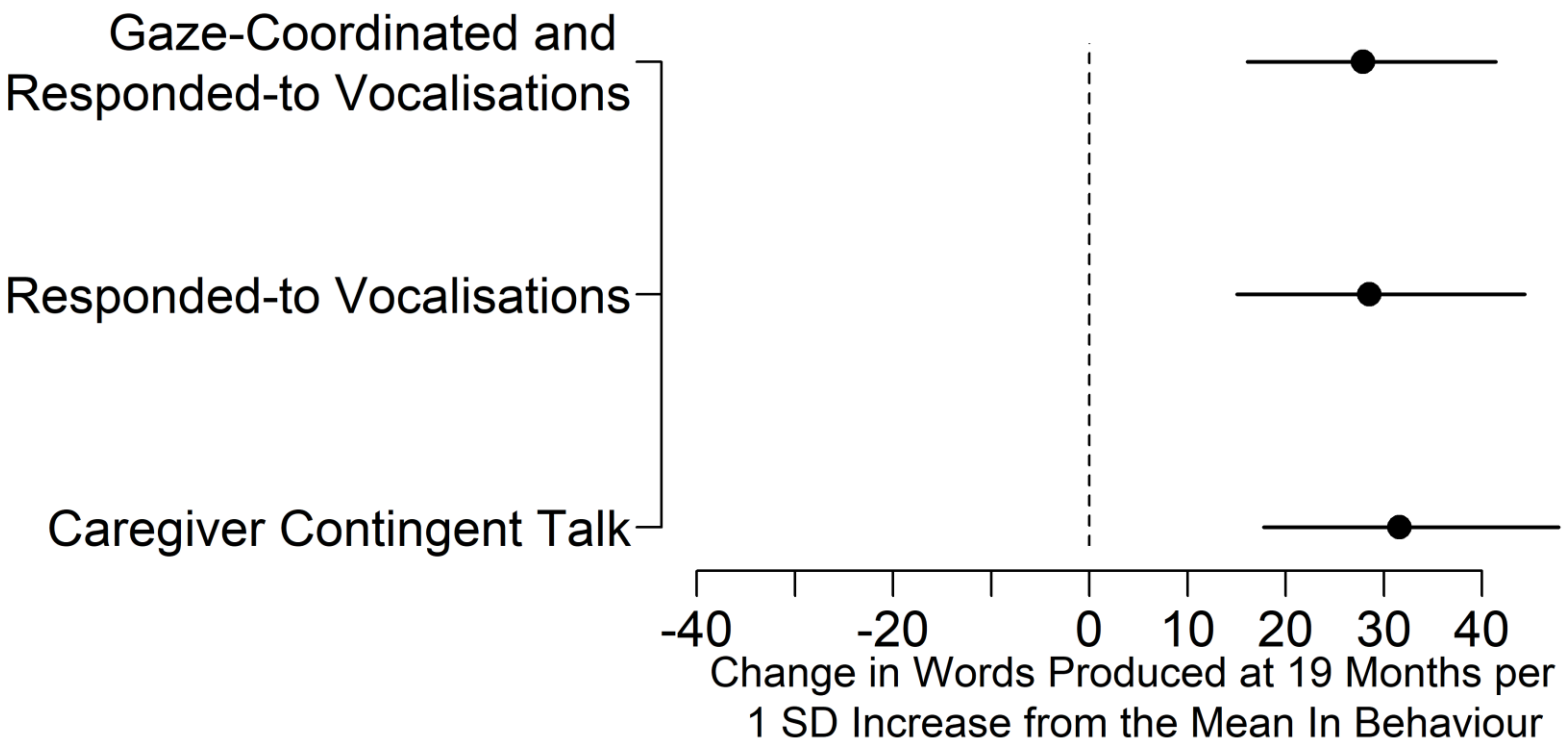
Applied to naturalistic behaviours of 58 socially-diverse infants observed at 11 and 12 months with vocabulary measures through to 24 months

Intentional communication predicts language



Donnellan, Bannard, McGillion, Slocombe, Matthews, 2020, *Developmental Science*

Intentional communication + response



Donnellan, Bannard, McGillion, Slocombe, Matthews, 2020, *Developmental Science*

Intentional communication predicts language

- Intentional vocalisations that were responded to by a caregiver best predictors of subsequent word use
- Practice with prelinguistic intentional communication facilitates the leap to symbol use
- Suggests learning is optimised when caregivers respond to intentionally communicative vocalisations with appropriate language

From video on how babies learn to communicate: https://www.youtube.com/watch?v=-89poSlS6rY

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- additional evidence for this role of experience from true experiments and natural experiments

The role of experience: Experimental evidence

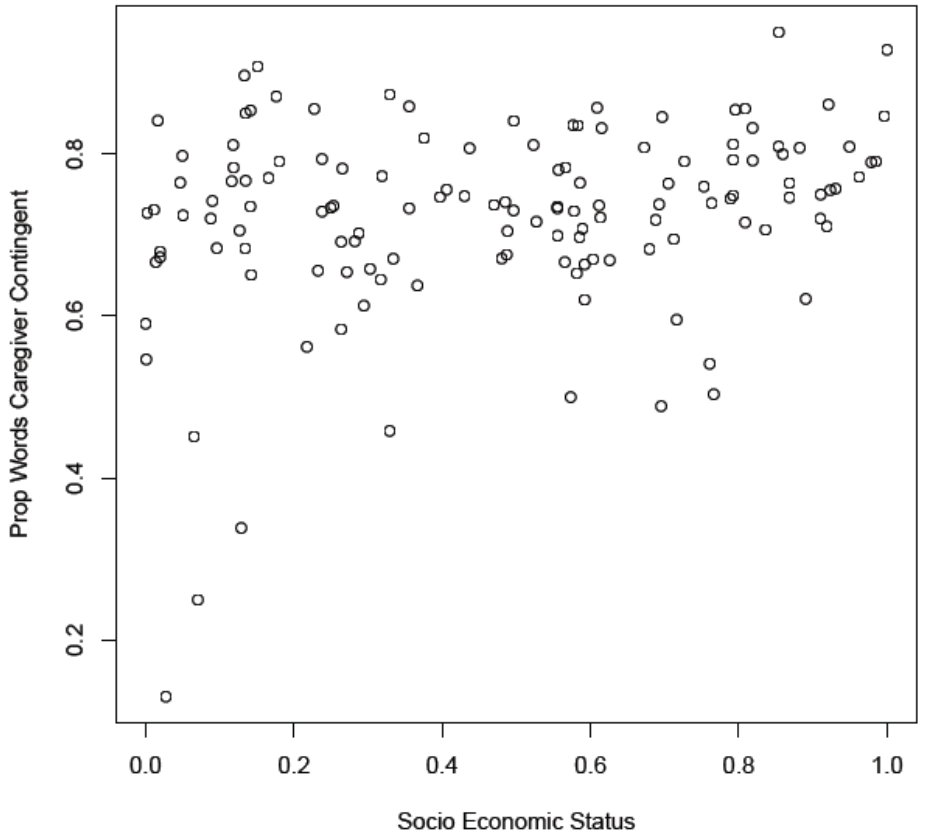
- Interventions that promote parent-child interaction at 11 months increase caregiver contingent talk and temporarily promote infant vocabulary development in lower SES children

McGillion, Pine, Herbert & Matthews, 2017,

Journal of Child Psychology and Psychiatry

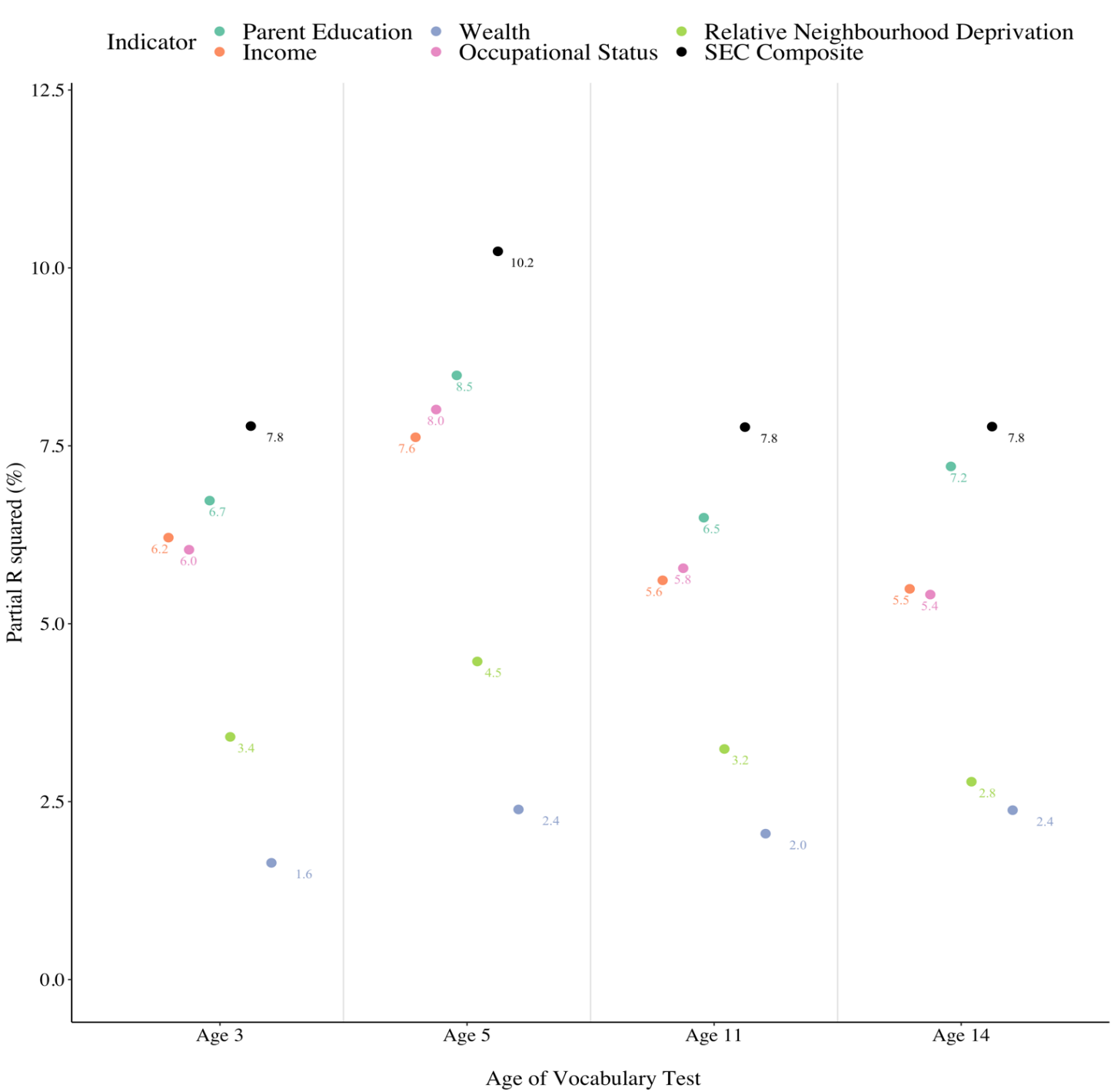
Social gradients in contingent talk

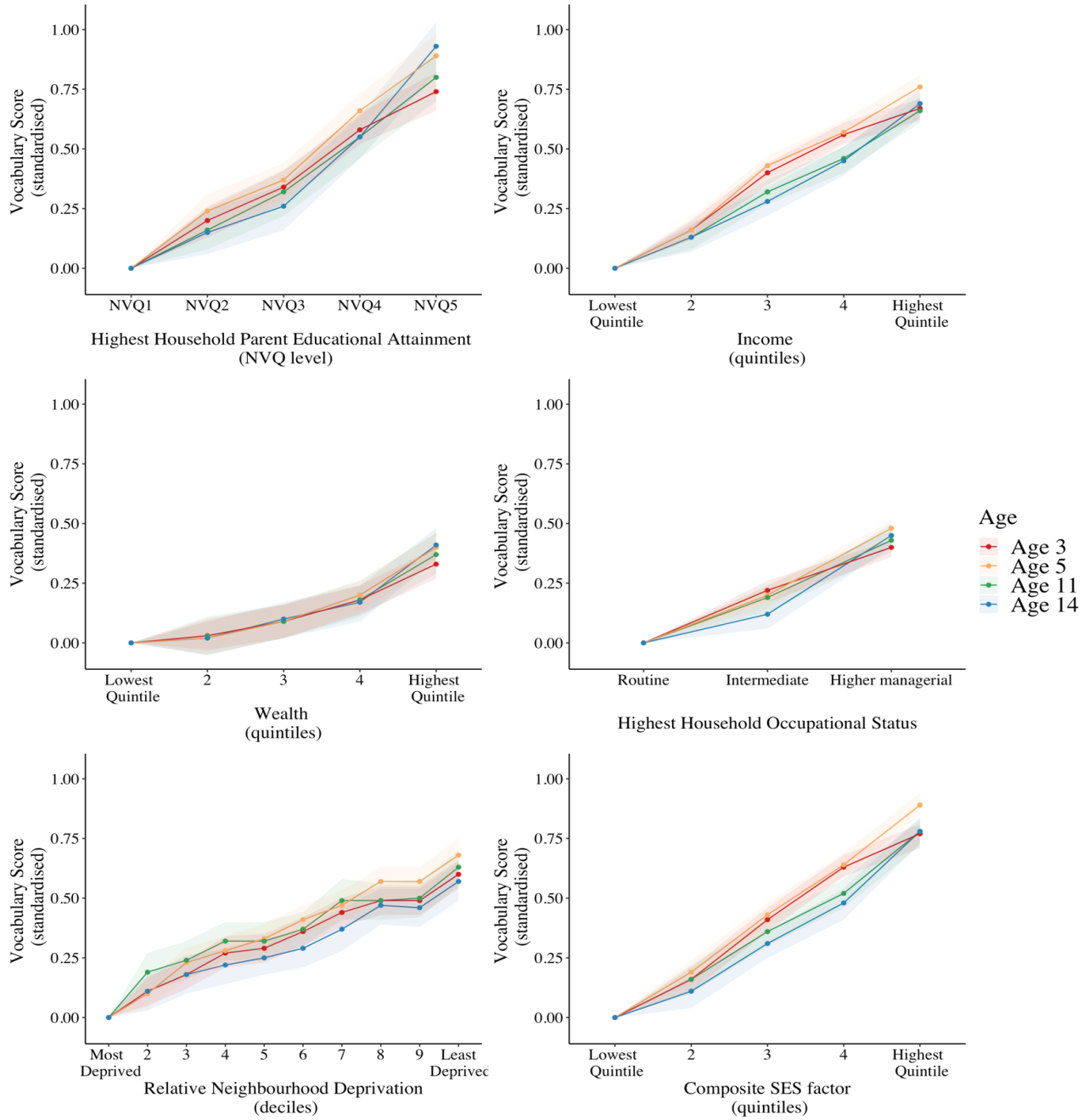
Caregiver contingent talk as a function of SES



McGillion, Pine, Herbert & Matthews, 2017

Thornton, Matthews, Patalay & Bannard, in prep




Vocabulary Score (standardised)
1.00
0.75
0.50
0.25
0.00
NVQ1
NVQ2
NVQ3
NVQ4
NVQ5
Highest Household Parent Educational Attainment (NVQ level)
Lowest Quintile
2
3
4
Highest Quintile
Income (quintiles)
Wealth (quintiles)
Routine
Intermediate
Higher managerial
Highest Household Occupational Status
Most Deprived
Least Deprived
Relative Neighbourhood Deprivation (deciles)
Composite SES factor (quintiles)
Age
Age 3
Age 5
Age 11
Age 14

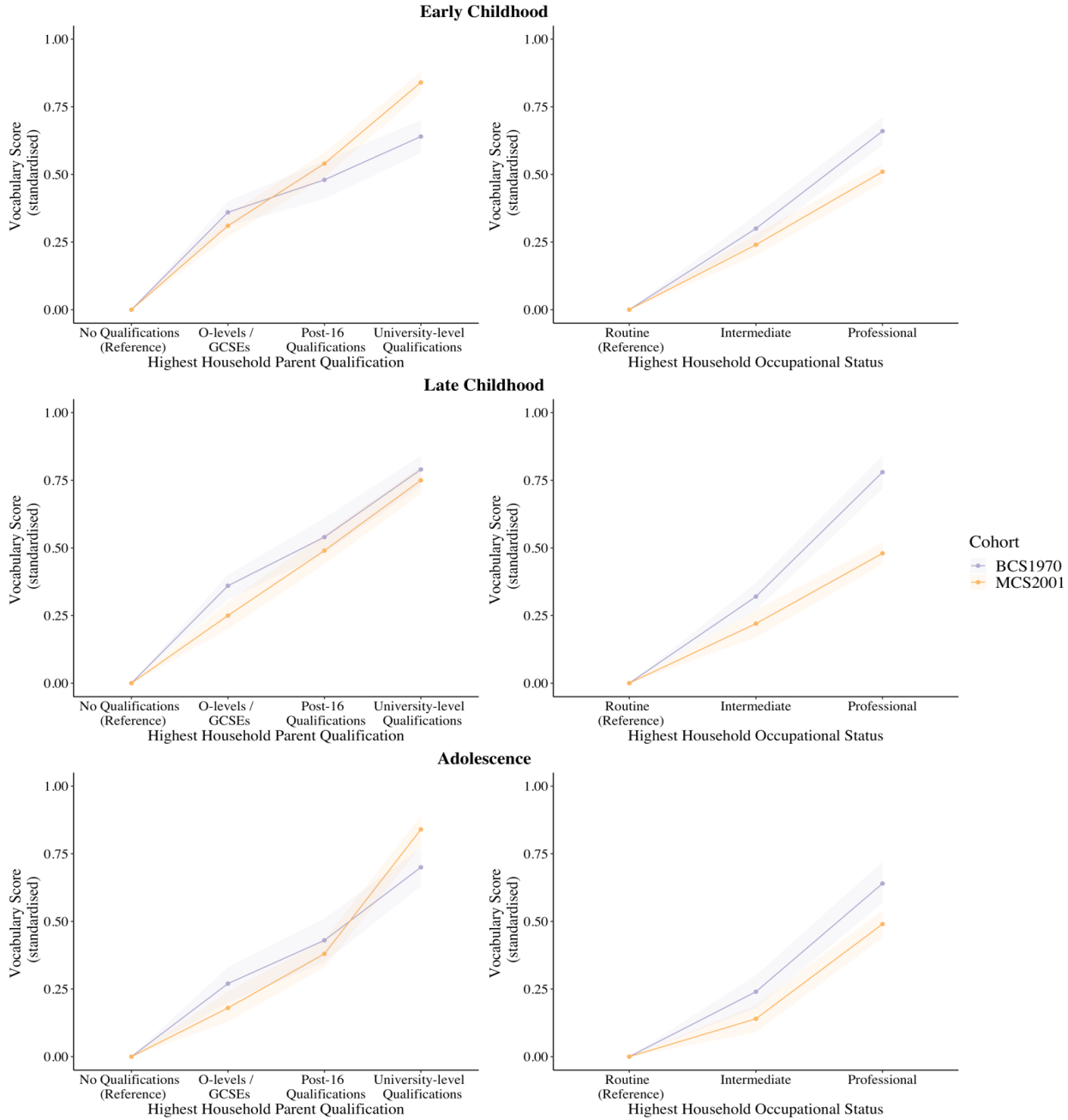


Fig. 3: Cross-cohort relationships between SEC and language ability

Discussion point

- What questions would you like to ask of this kind of dataset?

TINY Happy PEOPLE

*Your **words** build their **world***

A chatty child is a happy child, so Tiny Happy People is here to help you develop your child's communication skills through simple interaction and play.

Activities

Simple, fun and free activities to try with your baby. Just select the age of your child.

Tips and advice

Experts and parents give their advice on language learning, child development and parent life.

Discussion point

What video content / tips would you might like to see for parents of

- 1-year-olds
- 2-year-olds
- 3-year-olds
- 4-year-olds

Conclusions

- Newborn & Early dyadic interaction - **minded** communication
- Transition to coordinating attention to the outside world - **intentional** communication (gesture and vocalisations)
- Transition to first words
- SES effects – caregiver education, income and occupation most predictive. Effects generally stable across developmental and historical time. Perhaps need to focus on periods when children are about to enter and about to leave formal education.

Thanks

- Families who participated
- Collaborators, in particular Colin Bannard, Julian Pine
- Postdocs/ PhDs: Ciara Kelly, Michelle McGillion, Ed Donnellan, Gemma Stephens, Emma Thornton
- Funding especially British Academy Mid-Career Fellowship

Matthews, D (very nearly finished!) *Pragmatic Development: How children learn to use language for social communication.* Cambridge University Press

[Chapter 1: Definition of Pragmatics, **Chapter 2: Infancy,** Chapter 3: Conventional language as such, Chapter 4: Multiword speech, information structure, implicature, Chapter 5: Extended discourse and narrative, Chapter 6: Non-literal language, Chapter 7: Individual Differences and Atypical Development, Chapter 8: Learning mechanisms]