

I dunno, I guess, I mean whatever: Children form a many-to-many pragmatic mapping of shrug gestures between early and late childhood

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Background

- Early production of co-speech gestures can **precede, predict, and facilitate early language milestones** (Iverson & Goldin-Meadow, 2005).
- **Pragmatic gestures** (e.g., rhythmic beats, palm-up gestures) serve **critical interactive functions in everyday conversation** but their role in pragmatic development is understudied (Harris et al., 2017; Vila-Gimenez & Prieto, 2021).
- **Shrug gestures express many epistemic and interactive meanings** cross-culturally and cross-linguistically (Givens, 1977; Cooperrider et al., 2018).
- Verbal epistemic resources (e.g., modals) develop a many-to-many form-meaning mapping between early childhood and adolescence (Bliss, 1988; Leahy & Carey, 2020).
- Shrugs provide **unique insights for a multimodal model of pragmatic development**:
Shrugs function both emblematically (e.g., "all gone", "don't know") and pragmatically (e.g., "who knows?", "who cares?", "of course!") (Debras, 2017). Children shrug before age 2 but do not use shrugs with the same range of form and meaning as adults even in early adolescence (Beaupoil-Hourdel & Debras, 2017; Harris et al., 2017).

Research Questions

1. Do shrugs differ in form and meaning with and without speech?
2. Does the form-meaning mapping of shrugs change across development?

Methods

Participants

18 parent-child dyads
8 female, 10 male
Typically developing
Monolingual English-speaking
Racial, economic, and educational diversity of Chicago area

Spontaneous language and gesture data collected as part of a larger longitudinal study of language development

Early childhood:
12 home visits; every 4 months between 14 and 58 months
90 minutes of unguided interaction

Late childhood:
2 home visits at 11 and 13 yr.
3 5-minute prompted conversations about social topics

Children's shrug gestures annotated for form, meaning, and speech presence

Shrug Meaning

- **Epistemic**
 - Ignorance
 - Investment
 - Disaffiliation
 - Disinvestment
 - Inquiry
 - **Turn-taking**
- **Affiliative**
 - Affiliation
 - Disaffiliation
- **Other (excluded)**
 - Absence ("all gone"),
 - Completion ("all done")

Shrug Form

- **Shoulder raise**
- **Complete palm-up**
full wrist rotation, exposed palm, visible hold
- **Reduced palm-up**
partial rotation, atypical handshape, and/or rapid continuous movement

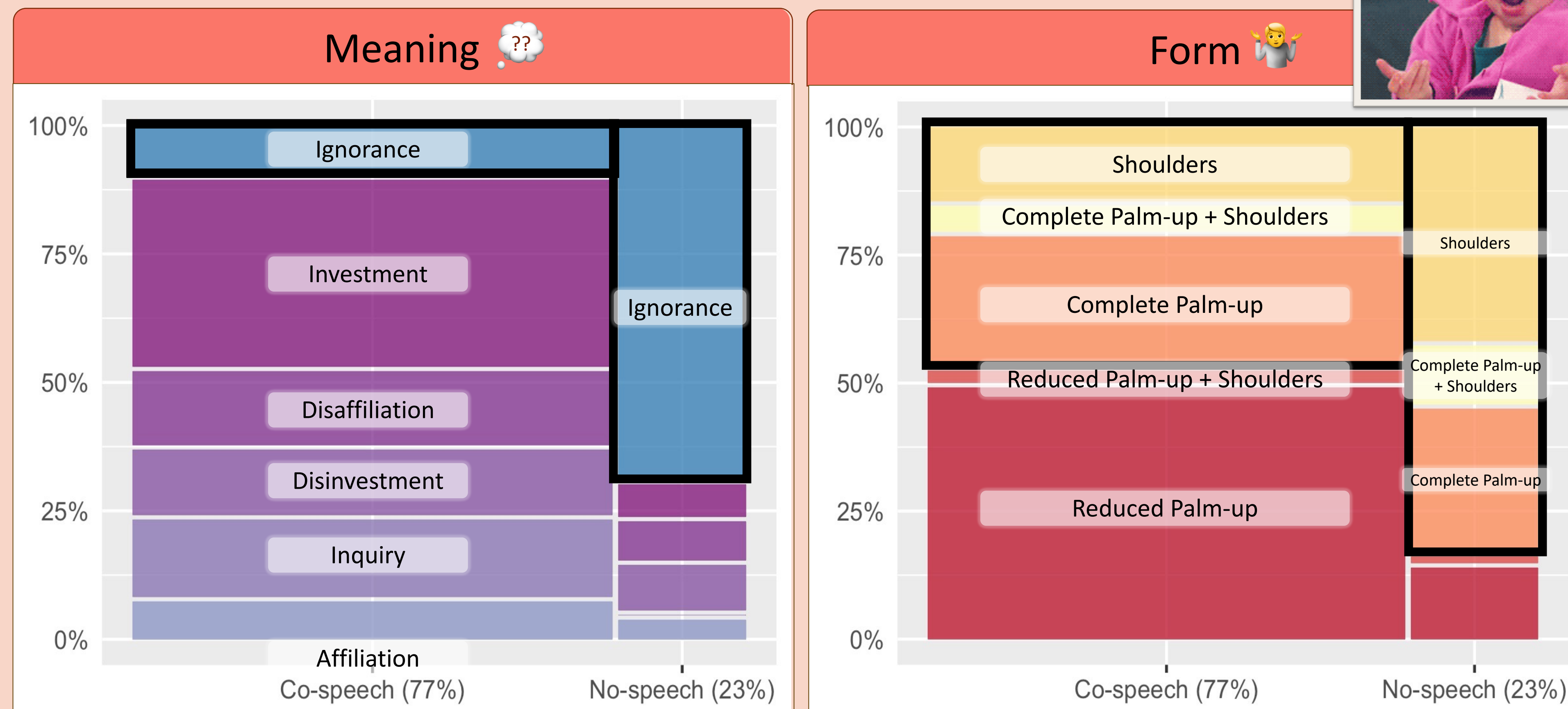
	Shoulders	Palm-up
+	+	-
+	+	+Complete
+	+	+Reduced
-	-	+Complete
-	-	+Reduced

Speech Presence

- **Co-speech gesture** (+Shrug, +Speech)
- **No-speech gesture** (+Shrug, -Speech)

Results

Early childhood



Do shrugs differ in form and meaning with and without speech?

Speech presence

Early childhood: Both meaning and form differed by speech presence

Meaning: $\chi^2 = 135.4, p < .001$

Form: $\chi^2 = 46.02, p < .001$

Late childhood: Only meaning differed by speech presence

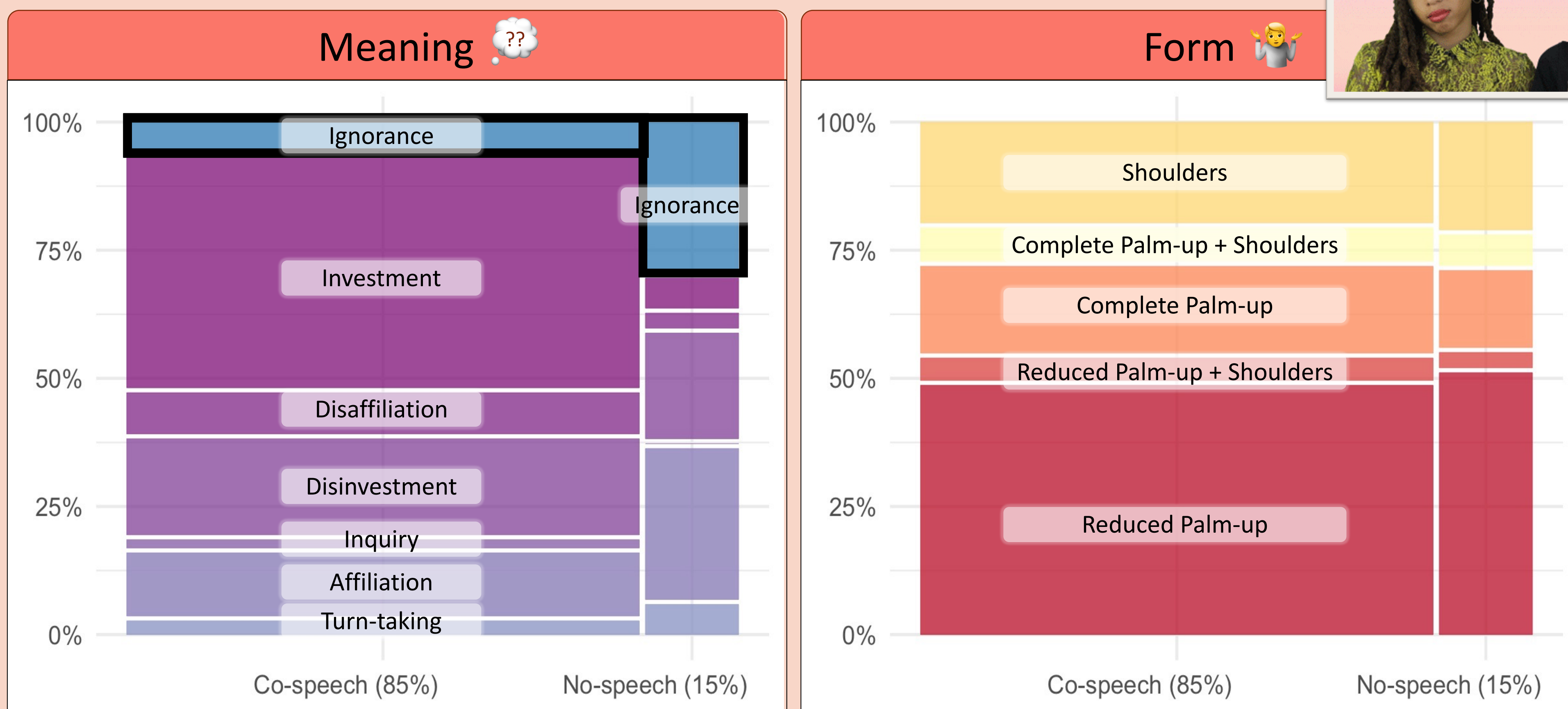
Meaning: $\chi^2 = 82.67, p < .001$

Form and meaning of no-speech shrugs (Post-hoc Chi-square)

Early childhood: Associated with **ignorance meaning** and **"unreduced" form**

Late childhood: Weak association with **ignorance meaning only** and no association with form

Late childhood



Does the form-meaning mapping of shrugs change across development?

Form-meaning mapping

(Binomial GLMM)

Early childhood: **Ignorance** associated with **unreduced form** above and beyond effects of speech presence

Late childhood: **No association** between form and meaning

Conclusions

In early childhood (but not late childhood) both the form and meaning of shrugs differed by presence of speech.

Shrugs without speech tend to use a recognizable form ("unreduced") and predictable meaning (ignorance).

In late childhood, there is a many-to-many mapping between form and meaning of shrugs not driven by presence of speech.

As pragmatic skills develop, children incorporate extralinguistic contextual information into communicative acts.

These results show **the form-meaning mapping of shrugs develops beyond early childhood** and emphasize the **necessity of approaching pragmatic development from a multimodal perspective.**