

Preliminary Evidence that Children can Learn Small Number Word Meanings within A Few Sessions

Pierina Cheung (NTU), Daphne Ang (NTU), Rebecca Merkley (Carleton U)

Number Word Acquisition is Protracted

- Children recite the count sequence early but take 1-2 years to learn meanings of the first few number words. Samples are typically from mid-SES homes in industrialized societies.
- Subset-knowers (1-knowers, 2-knowers, 3-knowers, 4-knowers) vs. CP-knowers (e.g., Wynn, 1990, 1992; Le Corre et al., 2006, among others; see Sarnecka, 2015; Cheung & Ansari, for reviews)

Conceptual Change Account of Number Word Acquisition

- Children learn small number words map onto parallel individuation representations, but PI represents individual objects and do not represent number inherently (Carey, 2009; Wagner et al., 2015)
- Existing studies tend to focus on CP acquisition

Goal: Testing the Conceptual Change Account in Small NW Acquisition

What predicts children's small number word acquisition?

Hypotheses:

1. Children who have acquired quantifier meanings and who can reliably represent small sets of individuals in working memory would learn the meaning of $N + 1$.
2. Children who have partial knowledge of $N + 1$ would also be more likely to learn the meaning of $N + 1$.

Causal Learning Paradigm

Sample: 15 subset-knowers ($M = 3;6, 2;11$ to $3;11$)
Preregistered $N = 72$

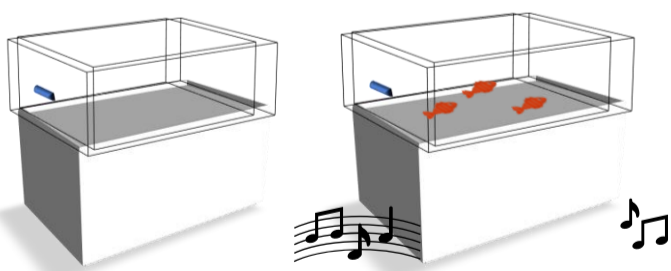
Number Box Training Sessions x 3

	Session 1 (Known Number box) (Trained Number box)	Session 2 (Trained Number box) (Trained Number + 1 box)
Phase 1	Introduce Number Box Mechanics with Known Number box - Known Number (music on) - Trained number (music off)	Repeat last phase from last session with another object - Trained Number (music on) - Trained number + 1 (music off)
Phase 2	Introduce <u>Trained Number</u> Box - Trained Number (music on) - Known number (music off)	Introduce <u>Trained Number + 1</u> Box Trained Number + 1 (music on) Trained Number (music off)
Phase 3	Continue with <u>Trained Number</u> Box - Trained Number (music on) - Trained number + 1 (music off)	Continue with <u>Trained Number + 1</u> Box Trained Number + 1 (music on) Trained Number + 2 (music off)

Session 3
(almost identical to Session 2 but with different objects)

Predictors:

Give-Quantifier Task
Singular-Plural Task
Non-verbal set production



Number Box: When the right number of objects go in, it makes music. Types: $N - 1$ box, N box, $N + 1$ box

Preliminary Results:

- 9 out of 15 children correctly gave $N + 1$ on Give-N
- Learners were better on Non-verbal set ($M = 2.4/3$) than non-learners ($M = 1.8/3$).
- They likely did not differ on Sing/PI ($M = 2.1$ vs. 2.3 , out of 4) or Give-Q (children gave all regardless of which quantifier was used)