Cross-domain influences on early word and action learning

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Introduction

In the existing literature, infants' and toddlers' early word and action learning is often studied independently of each other (e.g., Mani & Plunkett, 2008; Woodward, 1998). In social learning situations, however, caregivers usually use concurrent verbal (linguistic) and gestural (non-linguistic) information to communicate with their child.

Recent research indicates that the concurrent use of this information influences how humans process language and actions: For instance, Fukuyama and Yamakoshi (2013) found that 14-month-olds' imitation behavior was influenced depending on whether the action style or the end state of an action was accompanied by social-emotional cues (such as smiling, eye contact, or onomatopoeic verbalization).

Furthermore, Matatyaho-Bullaro, Gogate, Mason, Cadavid & Abdel-Mottaleb (2014) found that 8-month-olds' word-object learning was facilitated when the objects were presented with a shaking or looming action during labeling. As of yet, however, the interaction between linguistic and non-linguistic information is not completely understood.

Based on this background, the current research further investigates the cross-domain influences of linguistic and non-linguistic information in 18- and 24-month-old toddlers. More specifically, we ask if the use of verbal information before action demonstration influences toddlers' subsequent reproduction of the action.

Method

Stimuli & Design
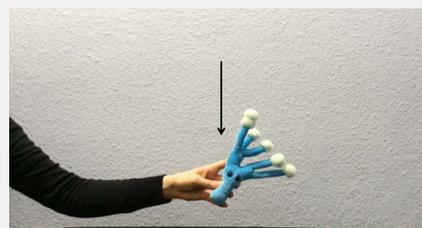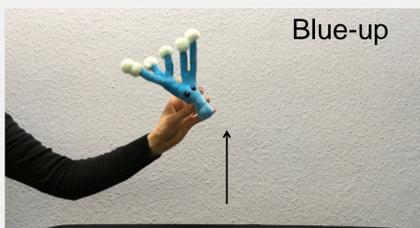
Blue-up

Yellow-side

Two objects: Blue, Yellow
Two actions: Upwards, Sidewards
Four object-action- pairings: Blue-up / Blue-side, Yellow-up / Yellow-side
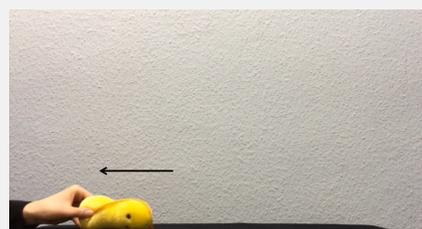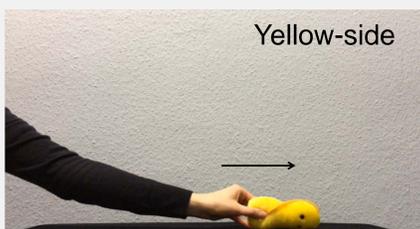
Verbal cues (in form of pseudo words) are given before action demonstration in **4 conditions** (between-subjects):

Noun-Condition
"Look, a Tanu/Löki!"

Noun & Verb-Condition
"Look, I dax/neem the Tanu/Löki!"

Verb-Condition
"Look, I dax/neem!"

Control-Condition
"Look, what I am doing!"

Baseline (60s)
↓
Demonstration 1 (3-6 Trials per pairing)
↓
Infant: Imitation 1 (60s)
↓
Demonstration 2 (1 Trial per pairing)
↓
Infant: Imitation 2 (60s)

Pilot-testing with action-presentation on eyetracker vs. live-demonstration

Pilot Sample

18-month-olds

N = 8 toddlers
N = 7 **video** demonstrations
N = 1 **live** demonstration

24-month-olds

N = 5 toddlers
N = 2 **video** demonstrations
N = 3 **live** demonstrations

All toddlers were tested in the Noun & Verb-condition

Hypotheses

18-month-olds

Object-action-pairing:
Noun & Verb > Control
Noun & Verb = Noun / Verb

24-month-olds

Object-action-pairing:
Noun & Verb > Control
Noun & Verb > Noun / Verb

Results & Discussion

In our pilot sample, none of the toddlers produced any of the actions presented during the demonstration phase. If the actions were suitable to investigate our research question, the highest amount of imitative behaviour would have been expected in the live demonstration of the Noun & Verb condition in the 24-month-old sample. So far, however, no imitative behaviour could be found.

The fact that the toddlers did not imitate even in the live condition suggests that the problem might be inherent to the actions themselves, because toddlers at this age usually prove to be apt imitators. Therefore, our next goal is to alter and optimize the actions presented to ensure that the infants are motivated to imitate the actions.

Possible solutions are:

- Adding a bell to the toys to elicit a sound effect during demonstration
- Using multi-step actions with a clear action-goal + action-effect
- Using highly familiar words instead of pseudo words

Thus, over the course of the next few months, the experimental design will be reworked and improved to make sure that we can effectively study the impact of language on action-understanding and add to the ever-growing knowledge about cross-domain influences on early word and action learning.

References

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