

Introduction

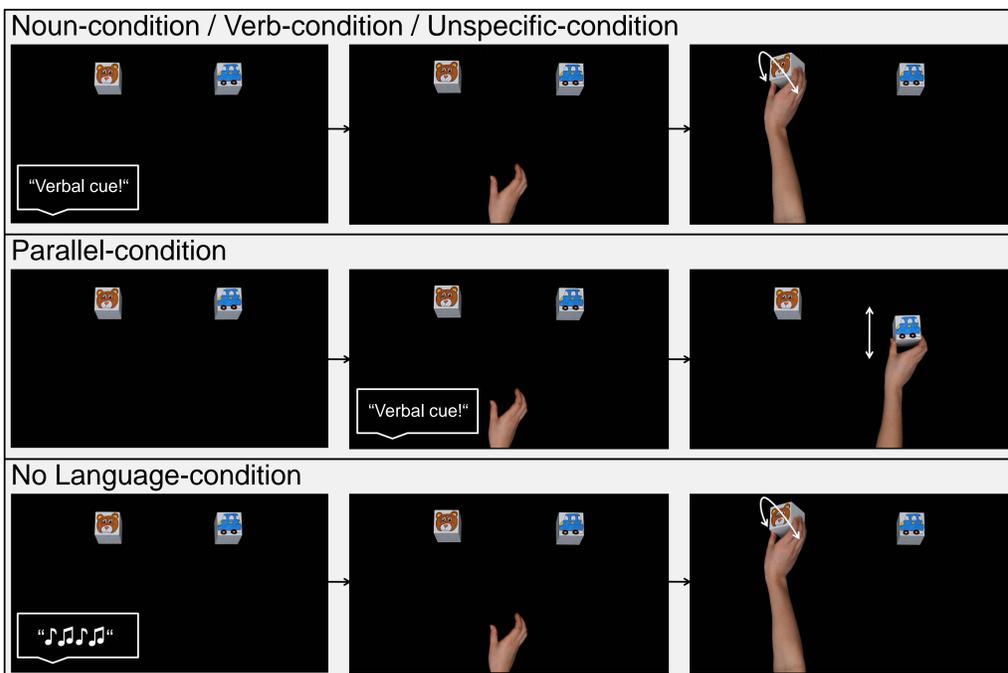
In the existing literature, infants' and toddlers' early word and action learning is often studied independently of each other (e.g., Mani & Plunkett, 2008; Woodward, 1998). In social learning situations, however, caregivers usually use concurrent verbal (linguistic) and gestural (non-linguistic) information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

Recent research suggests that verbal information during action demonstration can affect how an action is processed. Nonverbal action processing such as goal prediction can thus be facilitated or hindered by the accompanying verbal information. For example, Sciutti et al. (2016) found that verbal information during action demonstration hinders goal prediction in 14-month-olds during observation of a simple grasping action. Furthermore, results by Gampe and Daum (2014) suggest that the presentation of action verbs meddles with 12-

month-olds', but facilitates 24-month-olds' goal predictions. This series of studies aimed to further investigate how linguistic and non-linguistic information work together in the context of visual goal prediction.

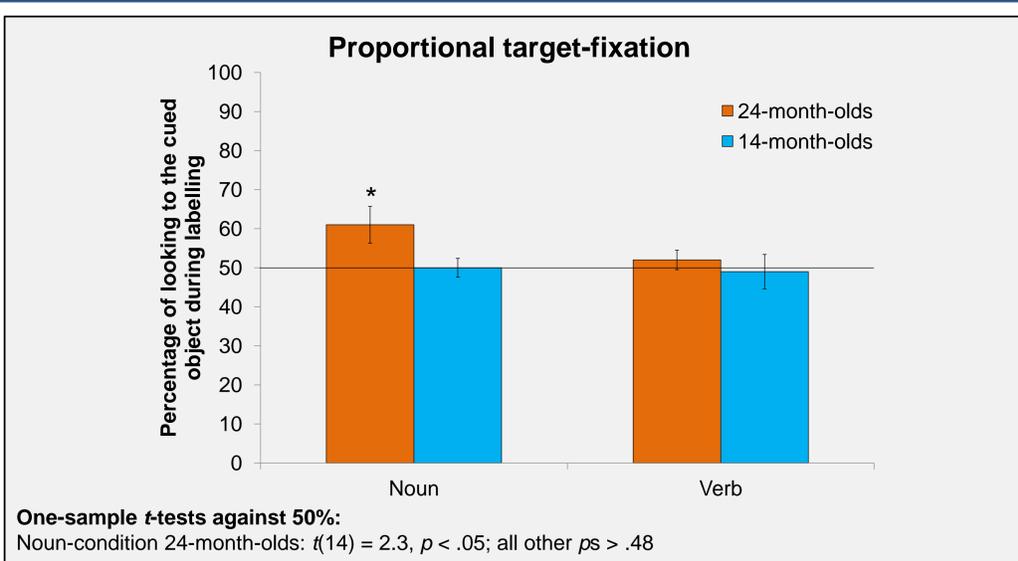
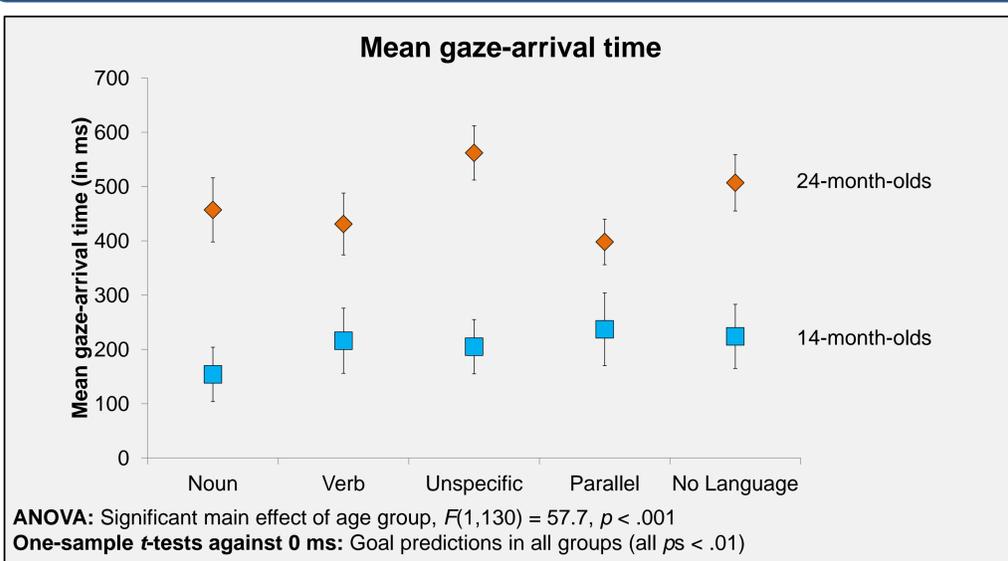
In a series of eye-tracking studies, 14- and 24-month-olds were presented with videos of a hand acting on one out of two objects with accompanying verbal information. Across five conditions, we varied the timing of the verbal cue (before vs. during hand movement) as well as the content of the verbal information (highlighting the noun, the verb, giving unspecific information or presenting a synthesizer sound). If verbal information can modulate early goal prediction, we should find systematic differences in the latencies to predict the goal locations between conditions.

Method



Two objects:	Two actions:	Four object-action-pairings:
Teddy	shaking	shake/push teddy
Car	pushing	shake/push car
Conditions (between subjects):		
1. Noun: "Look, teddy/car!"		
2. Verb: "Look, shaking/pushing!"		
3. Unspecific: "Look, showing something!"		
4. Parallel: "Look, teddy/car!" (verbal cue during hand movement)		
5. No Language: Synthesizer sound instead of a verbal cue		
Procedure:		
Stillframe (5500 ms) → Hand enters scene → Action → Stillframe (2000 ms)		
Verbal cue / Sound played during first stillframe (conditions 1./2./3./5.) or during hand movement (condition 4.)		
8 trials, DV: Mean gaze-arrival time & Proportional target fixation		
Participants:		
14-month-olds ($N = 70$, 34 ♀), $n = 14$ in each condition		
24-month-olds ($N = 70$, 33 ♀), $n = 14$ in each condition		

Results



Discussion

- Goal predictions in all age groups and conditions
- No differential effect of language cues
- Results do not suggest meddling/facilitating effect of verbal cues
- Differences between studies regarding prediction measure
- Systematic target fixation only in noun-condition with 24-Mo
- No association between verbal cue and target in other groups?
- Training phase too short?
- Pictures on wooden blocks difficult to map to the words?
- Task difficulty not (yet) accounted for
- Task with faster movement and changing object locations planned