

Grammatical or notional number?**3-year-olds' production and comprehension of verb agreement**

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Three-year-olds show substantial command of subject-verb agreement in production and comprehension [1,2], and use agreeing verbs to anticipate the number of an upcoming noun in online sentence processing [3]; see example (1). But what representations support early sensitivity to subject-verb agreement? Referential and grammatical number typically concur: plural count nouns refer to multiple objects, are grammatically plural, and control plural verb agreement. Thus, sensitivity to verb agreement could rely on representations of number as a semantic property (the subject's number of referents), as a grammatical property (the subject's syntactic features), or both. For adults, verb agreement depends primarily on grammatical number [4]. Do toddlers also privilege number syntax, or do they rely more heavily on number meaning in computing verb agreement? The answer to such questions bears on classic debates regarding the centrality of semantic analysis in syntax acquisition [5,6].

We examined 3-year-olds' production and comprehension of verb agreement when grammatical and notional number mismatched. Mass nouns (e.g., *toast*) are grammatically singular even when referring to multiple objects [7,8]; invariant plurals (e.g., *pants*) are grammatically plural even when referring to one object.

Experiment 1 tested 3-year-olds' production of verb agreement. On each trial, a picture eliciting a count (e.g., *shirt*), mass (*bread*), or invariant-plural noun (*pants*) appeared, and then moved onto one of two shapes. Children described this scenario (e.g., *The shirt(s) is(are) on the star*). For count nouns, children's marking of noun number and verb agreement was strongly influenced by the number of objects. In contrast, for mass nouns and invariant plurals, marking of noun number and verb agreement honored grammatical features: Children treated mass nouns as singular (*corn is*), and invariant plurals as plural (*glasses are*), largely ignoring the number of referents.

Experiment 2 explored whether 3-year-olds' could use grammatical number in online comprehension of verb agreement in a looking-while-listening procedure. On each trial, children saw two pictures, each showing one or two identical objects, and heard a sentence with an agreeing verb (examples 2-3). The number of objects in the two pictures always matched. We paired count nouns with mass nouns (*banana(s)*, *toast*) or invariant-plural nouns (*phone(s)*, *glasses*), to create trials in which verb agreement yielded information about the grammatical but not the notional number of the target. Three-year-olds used agreeing verbs (*is*, *are*) to predict the grammatical number of the upcoming noun. Children were reliably faster to switch from the distractor to the target picture in number-informative than in uninformative trials. Children were also reliably more likely to make this switch in a brief interval after the verb and before the onset of the noun, in informative than in uninformative trials.

Thus 3-year-olds, like adults, privilege number syntax over number meaning in deriving and interpreting verb agreement. In production and comprehension, they linked plural-marked verbs with grammatically plural subjects regardless of the number of real-world entities the subject noun referred to. This suggests that formal grammatical categories, not reducible to semantic categories, provide the foundation for the acquisition of grammar.

Examples

	<i>Experimental</i>	<i>Control</i>
Informative: "Where <u>are</u> the good cookies?"	[1 apple, 2 cookies]	[2 apples, 2 cookies]
Uninformative: "Can you find the good cookies?"	[1 apple, 2 cookies]	[2 apples, 2 cookies]
<u>Mass Trials</u>		
Informative: "Where is the good toast/are the good bananas?"		[2 bananas, 2 pc. toast]
Uninformative: "Where is the good toast/banana?"		[1 banana, 1 pc. toast]
<u>Inv.Pl. Trials</u>		
Informative: "Where are the pretty glasses/is the pretty phone?"		[1 phone, 1 pair glasses]
Uninformative: "Where are the pretty glasses/phones?"		[2 phones, 2 pairs glasses]

References [1] Brown. (1973). A first language. [2] Brandt-Kobele & Höhle. (2010). *Lingua*. 120(8), 1910-1925. [3] Lukyanenko & Fisher. (2010). Presentation at BUCLD 35. [4] Bock & Middleton. (2011). *Natural Lang. and Ling. Theory*. 29(4), 1033-1069. [5] Bowerman. (1973). In Moore (Ed.) *Cognitive development and the acquisition of language*. [6] Morgan & Newport. (1981). *J. of Verbal Learning and Verbal Behavior*. 20(1), 67-85. [7] Barner & Snedeker. (2006). *Lang. Learning and Development*. 2(3), 163-194. [8] Gordon. (1985). *Cognition*. 20, 209-242.