The acceptability of null subjects

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Languages vary in their subject requirements: some languages permit the subject to be dropped in declarative clauses, as in (1), while others require an overt subject.

(1) a. ∅ plays with blocks.
    b. ∅ plays with exciting new blocks.

Two-year-olds often produce sentences without a subject, even in overt subject languages. These *null subject* sentences may be due to a non-adult grammar which *permits* null subjects[1-4], or to a processing bottleneck, which *causes* the subject to be dropped despite the adult grammar[5-12].

If null subjects are due to a non-adult grammar, then sentences with null subjects will be grammatical before the adult grammar is acquired, and only considered ungrammatical after the grammar changes. But **if null subjects are due to a processing bottleneck, then they are more likely to be accepted in contexts with a high processing load - at any age.**

We test this processing prediction with 85 adults in a speeded acceptability judgment task (1-7 rating scale). Participants saw sentences with a *null* (1) or *overt* (2) subject, and with an *inflected* (1;2) or *bare* (3) verb (within-subjects).

(2) a. The child plays with blocks.
    b. The child plays with exciting new blocks.
(3) a. {The children/∅} play with blocks.
    b. {The children/∅} play with exciting new blocks.

We manipulated the availability of processing resources in two ways:

VP length: VP length is varied from 3-5 words (within-subjects). Since null subjects are produced more often with longer VPs[5-9], as in (1b and 3b), **null subject sentences should be more acceptable with a longer (1b) than shorter (1a) VP.**

Timing: sentence presentation time is varied from 1200ms (N=30), 2000ms (N=25), or no limit (N=30). If null subjects are due to limited processing resources[8-10], then **greater acceptability for null subjects is predicted under stricter time limits.**

Results are presented in Fig.1, with *z*-scored ratings. A mixed effects model (Table 1) revealed a significant three-way interaction between subject form, verb form, and VP length:

- as predicted, null subject sentences are less acceptable than with an overt subject
- **the difference between null and overt subjects is greater with an inflected form (*plays*; bottom 3 figures) than with a bare form (*play*; top 3 figures)**
- **within the bare forms, null subjects are more acceptable with short than long VPs,** particularly in the timed conditions (A vs B) - an unexpected finding on both accounts

In addition, overt subject sentences are more acceptable with inflection (bottom white bars in Fig.1) than without inflection (top white bars), a further unexpected finding given that overt subjects are grammatical in general.

While a grammatical account predicts no effect of VP length for comprehension, the processing account predicts the *reverse* of the observed effect: greater acceptability for a longer VP. However, the bare forms *are* grammatical if interpreted as an imperative rather than as a declarative[4]. An imperative is possible regardless of VP length, but the null version of the short VP in (3a) is more likely as an imperative than the null version of the long VP in (3b). This explains the greater acceptability for null subjects with a bare verb than with an inflected verb.

The imperative form thus interferes with judgments under a processing load – i.e. the timed conditions. If children's null subjects involve similar interference from imperatives in English, then individual differences in null subjects may be predicted by imperatives in the linguistic input. Cross-linguistic differences are also predicted based on verb form, for acquisition and processing.

Fig.1. *z*-scored ratings: null subjects are more acceptable with a bare verb (top row), and more acceptable with a short VP (**A**) than a long VP (**B**) in the timed conditions (1200ms & 2000ms)

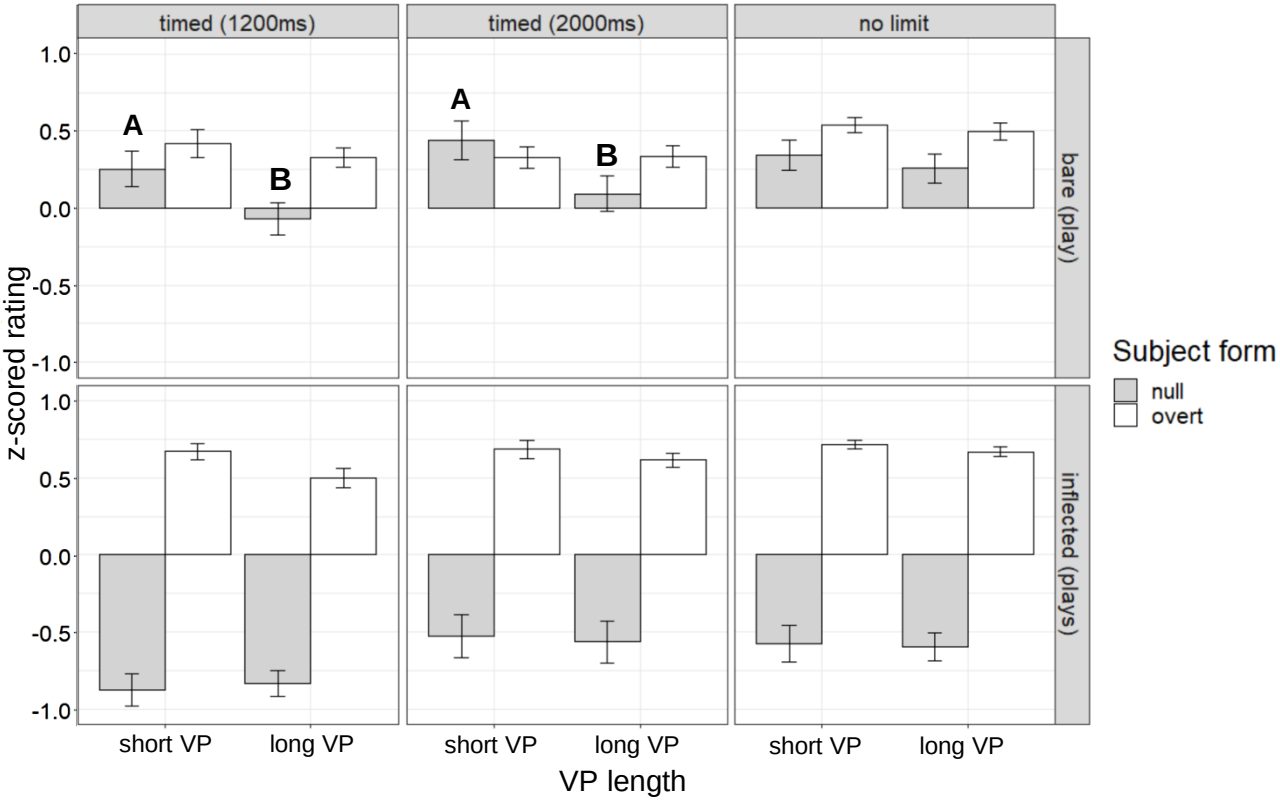

Table 1. Model with fixed effects subject form, verb form, VP length (within-subjects), and timing (between-subjects), and random effects subject and item; coding is effects coding

Fixed effects	Estimate	SE	*t*-value	*p*-value
Intercept	-0.66	0.04	-14.72	<.001
subject form (null/overt)	1.26	0.05	26.74	<.001
verb form (bare/inflected)	0.75	0.05	13.84	<.001
timing (no limit - 1200ms)	-0.40	0.11	-3.51	<.001
timing (no limit - 2000ms)	0.24	0.12	2.07	0.04
subject form (null/overt) : verb form (bare/inflected)	-0.96	0.07	-14.36	<.001
subject form (null/overt) : VP length (modifier/no modifier)	0.11	0.07	1.70	0.09
verb form (bare/inflected) : VP length (modifier/no modifier)	0.29	0.08	3.74	<.001
subject form (null/overt) : timing (no limit - 1200ms)	0.22	0.13	1.69	0.09
subject form (null/overt) : timing (no limit - 2000ms)	-0.21	0.14	-1.55	0.12
subject form (null/overt) : verb form (bare/inflected) : VP length (modifier/no modifier)	**-0.31**	**0.09**	**-3.32**	**<.001**

References

[1]Hyams 1992 in *Theoretical Issues in Language Acquisition*, [2]Hyams & Wexler 1993 *LI,* [3]Hyams 2011 in *Handbook of Generative Approaches to Language Acquisition*, [4]Orfitelli & Hyams 2012 *LI*, [5]Bloom 1989 in *Papers and Reports on Child Language Development*, [6]Bloom 1990 *LI*, [7]Bloom 1993 *LI*, [8]Valian 1991 *Cognition*, [9]Valian, Hoeffner, & Aubry 1996 *Developmental*

Psychology, [10]Valian & Aubry 2005 *JCL,* [11]Chen, Valian, & Chodorow 2016 *BUCLD41*, [12]Valian 2016 in *Oxford Handbook of Developmental Linguistics.*