

Adjunct control and the poverty of the stimulus: availability vs evidence

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Subject control in non-finite adjuncts is observed across languages (English examples in Table 1). The primary mechanisms - high attachment and c-command by the next highest NP (*the c-command rule*) - are also consistent. Research on the acquisition of adjunct control has generally focused on these grammatical components, and when the grammar is acquired. This paper considers these components in the context of the linguistic input to ask *how* control in adjuncts is acquired.

The following hypotheses are considered for high attachment and the c-command rule:

- (1) Evidence is available for these components in the input, either from
 - (a) observing instances of adjunct control directly, or
 - (b) generalizing from similar structures (e.g. complement control or finite adjuncts)
- (2) evidence is not available in the input, and at least some aspects are not learned

These hypotheses are tested based on previous experimental data and novel corpus data. Importantly, *availability* in the input is contrasted with *evidence* in the input: although adjunct control is available in the input, evidence for the syntactic dependency is not as clear (considering both language-specific and general learning mechanisms). This suggests that at least some aspects of adjunct control are innate - an argument from the poverty of the stimulus. To conclude, implications are considered for linguistic dependencies and evidence in the input.

- (1) (a) Attachment height and the c-command rule are inferred, based on input frequencies:

The information that would allow for these inferences is not clear. For example, the antecedent of PRO is not likely to be a reliable cue for the adjunct control dependency: in previous studies, children have accepted a wider range of interpretations than allowed by the adult grammar. Therefore, children are likely to access these interpretations in the input. Different accounts have been proposed for children's non-adultlike interpretations [1-9]; importantly, non-adultlike interpretations of PRO would be inconsistent with high attachment or the c-command rule. As a result, tracking the antecedent would provide the wrong evidence.

- (b) Children generalize from a similar structure:

The c-command rule is also observed in complement control. Generalizing from non-finite complements to non-finite adjuncts does not explain how the c-command rule is acquired, though, and assumes that:

- children infer the c-command rule from complements only (and not adjuncts)
- the generalization is from complements to adjuncts and not vice versa.

Meanwhile, the same attachment height is observed in finite adjuncts (Table 1). A corpus search [10] revealed that both finite and non-finite adjuncts do appear in the linguistic input, but generalization from finite adjuncts is not likely to involve the antecedent of the adjunct subject: for (overt) finite adjunct subjects, there was a roughly even split for the antecedents between the main clause subject and an external antecedent, while non-finite adjunct subjects (PRO) showed the expected subject control pattern (Figure 1).

Table 1: Examples (with counts) of finite and non-finite adjuncts in CHILDES (NA Eng)

	Complementizer	Example	Counts
Non-finite adjuncts	after	I think you should take a shower tonight after running.	52
	before	I want a story before going to sleep.	34
	without	I'm just holding a cup without making it crack.	208
	for	Can you scold Jennifer for stepping on the truck?	362
Finite adjuncts	after	I'll read it to you after you show me the pictures.	472
	before	Mommy brushed your hair before we left home.	826

(2) The c-command rule is a general property of null content in non-finite clauses, and high attachment is associated with non-finite adjuncts:

This predicts that the features which vary cross-linguistically are needed from the input:

- language-specific realization of finiteness
- complementizer form-selected clause link (finiteness, complement/adjunct)
- information about exceptions

In contrast with attachment height and the c-command rule, the above properties - particularly finiteness and complementizer form - are more likely to be overt morphemes, which may be easier to track across multiple frames. For example, instead of tracking the distribution of antecedents for adjunct PRO, children may be tracking a property like finiteness in order to link specific complementizers in a language to their respective frames. This strategy relies on evidence from the input for each acceptable complementizer/clause-type, which aligns with the wide variation in acceptable combinations across languages.

It is also predicted that:

- exceptions (to attachment or the c-command rule) will be particularly salient, with a higher overall frequency. For example, non-finite adjuncts with ‘for’ do not have the typical subject control profile, but are more frequent than other non-finite adjuncts.
- children's prior expectations about finiteness in adjuncts may be revealed by lower frequency complementizers (e.g. ‘when,’ ‘despite’): if selectional restrictions for complementizers are acquired from the input, then (in an experimental setting) children may produce complementizer/clause pairings that are ungrammatical in the adult grammar or avoid pairings that are grammatical.

If the acquisition of adjunct control does not involve the adjunct control dependency directly, then this has implications for the acquisition of other structures, especially involving an antecedent. In particular, if the distribution of antecedents is not a reliable source of evidence, then few options are available for inferring any restrictions on possible antecedents. Moreover, if the distribution of antecedents is not used for the acquisition of adjunct control, this is likely to be the case for other dependencies as well - regardless of input frequency, and particularly when children are more likely to access non-adultlike interpretations (as evidence against the adult grammar).

References

[1] Goodluck (1981) *Lang Acq and Ling Theory*; [2] Hsu et al (1985) *Cognition*; [3] McDaniel et al (1991) *Lang Acq*; [4] Cairns et al (1994) *Language*; [5] Adler (2006) *MIT Ling dissertation*; [6] Goodluck & Behne (1992) *Theoretical issues in lang acq*; [7] Wexler (1992) *Control and Grammar*; [8] Broihier & Wexler (1995) *MITWPL 26*; [9] Gerard et al (2018) *Glossa*; [10] MacWhinney (2000) *The CHILDES project*

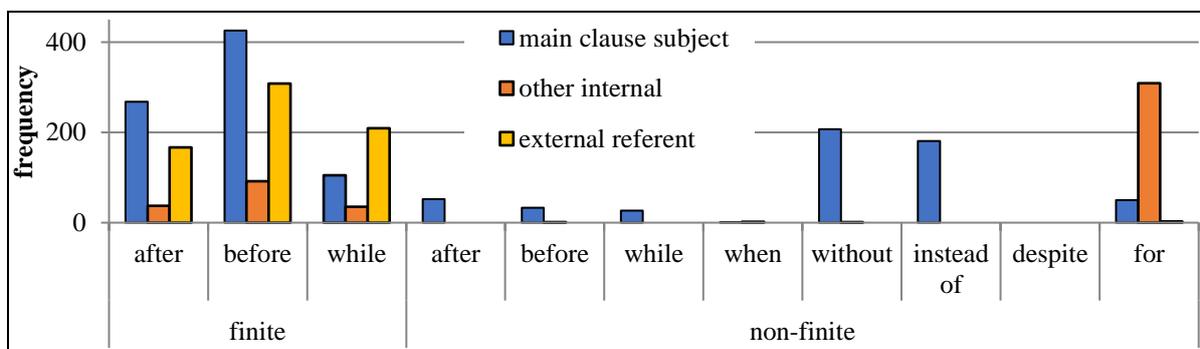


Figure 1: frequency of antecedents in finite and non-finite adjuncts in CHILDES

- North American English (NA Eng), 2.8 million utterances;
- 15% utterances from target child (similar distributions for children and adults)