THE ACQUISITION OF RAISING RECONSIDERED

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1. Background

1.1 *Passive Comprehension*

Recent experimental findings have led to renewed interest in maturation-based grammatical accounts for certain observed comprehension delays in first language acquisition, such as the acquisition of verbal passives. Emerging evidence suggests that delayed comprehension of (non-actional) verbal passives is due to premature children lacking some linguistic capacity needed to derive adult passive representations, and not due to some lack of "learning". Evidence for (genetic) maturation as opposed to learning theories comes from new data supporting cross-linguistic delay of passives (Crawford 2005), behavioral genetic twin research demonstrating significant correlations on passive comprehension for identical, but not fraternal twins (Ganger, Dunn, and Gordon 2004), and findings that passive acquisition is not predicted by environmental factors, but by age (Hirsch, Modyanova, and Wexler 2006).

A challenge for maturational approaches involves being able to correctly characterize the grammatical system of premature children. Wexler's (2004) Universal Phase Requirement (UPR) holds that premature children take all *v*Ps to define strong phases, and as such children are not able to raise the logical object to surface subject position (Spec,TP) due to the intervening strong *v*P. Hyams and Snyder (2005) instead propose the Universal Freezing Hypothesis (UFH), which holds that children apply the Freezing Principle (Müller 1998) to all cases of movement, thereby banning further movement from already moved constituents. Hyams and Snyder adopt Collins' (2005b) smuggling account of passives, which coupled with UFH, results in a minimality violation for passives for premature children. Both theories correctly predict that passives should be delayed prior to maturation. They differ, however, with respect to their predictions for other syntactic structures.

1.2 *Raising Comprehension*

Both UPR and UFH predict that just like passives, subject raising over an experiencer-phrase (1) should be delayed.[1]

(1) Roger Clemens seems to fans to inject Human Growth Hormone.

On UPR, the *v*P of the raising verb defines a strong phase, thus an agreement relationship cannot be established between matrix Tense (T) and the embedded subject. For UFH, the delay is due to Freezing applying to another case involving smuggling (Collins 2005a). Experimental evidence corroborates these predictions. Not only do young children have difficulties with raising over experiencers, but the observed comprehension delays occur at the same ages as those found for verbal passives, and furthermore, performance on raising over an experiencer and verbal passives track within individual children (Hirsch and Wexler 2007). UPR and UFH, however, make divergent predictions for raising when no experiencer is present. UPR continues to predict delay since an agreement relationship needs to be established between matrix T and the embedded subject, regardless of the absence of an intervening experiencer. UFH, though, predicts no delay, following Collins' (2005a) argument that smuggling does not obtain in raising structures without experiencers, such that the Freezing Principle fails to apply to render the derivation illicit.

The relevant question becomes how do young children fare with sentences involving raising without an experiencer-phrase? Becker (2006) addresses this question in two experiments, the first of which explores children's knowledge of raising sentences (without an experiencer-phrase) (2) and syntactic subject control sentences (3).

(2) The hay seems {to be on the ground / to be excited}.
(3) The flower wants {to fly away / to be pink}.

Children are asked to judge the grammaticality of the raising and control sentences, which can have either a compatible embedded predicate (the first cases) or an incompatible predicate (the second cases), where "compatibility" is taken as whether or not the embedded predicate could reasonably apply to the subject independent of the matrix verb.[2] Becker claims to find good child comprehension of the raising sentences

[1] Under neither account would the semantically equivalent, but syntactically distinct unraised counterpart (i) be ungrammatical for these children.

(i) It seems to fans (that) Roger Clemens injects Human Growth Hormone.

[2] Adults accept raising with a compatible predicate, but reject the other three sentence types.

(acceptance of raising sentences with compatible embedded predicates, rejection of raising sentences with incompatible embedded predicates), and raising-like interpretation for the control sentences (if *want* meant *seem* in the above example, only compatible embedded predicates would be grammatical, since a flower can seem to be pink, but not to fly away). Before drawing strong conclusions about her data, Becker considers the possibility that children could simply be ignoring the raising verb or treating the raising verb as a copula, in either case rendering (2) as (4).

(4) The hay is {on the ground / excited}.

If children lack the means to compute syntactic raising, but adopt such a copula-analysis to compensate, they would nevertheless provide adult responses to the raising sentences (since hay can be on the ground, but cannot be excited). It is therefore imperative to rule out the possibility that children are using a copula-analysis to interpret raising sentences. Becker (2006) attempts to confront this possibility in her second experiment, using the dichotomy between appearance and reality to distinguish *is* (the copula-analysis) from *seem* (the raising-analysis). One scenario involves a white dog that walks under a purple light, thus appearing purple. The child is then asked to judge the truth of *The dog seemed to be purple*. Becker's idea is that if the child is correctly parsing the matrix verb as a raising verb, and has no trouble with raising, he will respond *true* since the dog does in fact seem to be purple. If, on the other hand, the child is attempting a copula-analysis, he should respond *false* since the dog is actually white. Becker finds children provide adult responses for the raising sentences in her second experiment, from which she concludes, along with her first experiment, that children have no difficulties with raising (with no experiencer). Admitting the results from both experiments, this appears on first pass to support UFH over UPR. Before accepting this conclusion, however, three potential concerns must be addressed.

1.3 *Potential Concerns Regarding Becker (2006)*

The first concern is how to reconcile Becker's claim that children as young as three years of age comprehend raising with Hirsch and Wexler's (2007) finding that many younger children, including most three year-olds (60% in their study) failed to comprehend the unraised counterparts of those raising sentences, which Becker did not test.

The second concern centers around Becker's claims regarding syntactic control. Becker argues that children interpret control verbs like *want* as raising verbs like *seem*, and that this is further evidence for

children comprehending raising without an experiencer. Unfortunately, this claim does not fit with the large acquisition literature otherwise demonstrating that children have no problems with obligatory subject control into an embedded complement clause (Pinker 1984; Wexler 1992).

The third concern relates to the experimental manipulation at the heart of Becker's second experiment. Recall that Becker hypothesizes that if children were using a copular strategy, they would interpret *seem* as *is*, answering *false* to *the dog seemed to be purple*. This hypothesis crucially assumes that the child would answer *false* to *the dog was purple*. We find, however, that many native English-speaking adults judged *the dog was purple* to be fine in this context. They justified their responses by stating that the dog was purple under the light since his fur looked purple. When pressed if the dog *really* was purple, all answered no.

To ensure that the child is sensitive to the dichotomy between appearance and reality, an independent measure is needed. An obvious test would be to ask children if the dog *really* was purple. If they answer correctly, and continue to answer correctly on the raising condition, then Becker's claim that children comprehend raising is supported. If, however, children accept *is* when the dog is under the light, Becker's raising result can be explained as a combination of the copular strategy and a conflation of appearance and reality by the child, and there is thus no reason to take her data as support for children's early comprehension of raising. In pilot work for the experiment presented below, we tested children using this exact copula condition, and found that they consistently answered incorrectly that the dog was purple. Following the addition of *really* to the test items, no child had problems with this condition.

2. Methods

This investigation uses a Truth-Value Judgment (TVJ) task (Crain and Fodor 1993). This paradigm first involves having the child view a scenario. Next, an observing puppet comments on the scenario, and the child indicates whether the puppet commented truthfully or untruthfully. Four unique scenarios were used to keep children engaged in the task; each one consisting of a story about two pictures. The scenarios in this study were similar, or in some cases, identical to those used in Becker (2006). In the first picture of one scenario, a white dog is standing next to a purple light, and remarks that he does not want to go under the light, because it will make people think his fur is purple, a color he does not like. In the second picture, he has nonetheless gone under the light, making his

fur look purple, although a tiny portion of his tail remains outside of the light, to remind the child that in reality, his fur is white (Figure 1).

Figure 1: Left: *reality*—Dog IS white. Right: *appearance*—Dog LOOKS purple.

Following the scenario, the child is asked three comprehension questions before the puppet comments on what occurred: "What color is the dog in real life?", "What color does it look like the dog is?", and "What color does the dog want to be?"[3] These questions serve to establish that the child understands the details of the scenario. If the child does not answer these correctly, the scenario is repeated.

The child is told that a puppet (Mr. Bear) will comment at the end of each scenario, but that he is somewhat silly and will often make mistakes. Thus, the child must serve as Mr. Bear's teacher, and let him know when he is right or wrong, and why, so that he can learn to do better.

Once the child has demonstrated that he understands the scenario, the first picture (e.g. The dog standing next to the light) is removed, and Mr. Bear comments *only* on the second picture. Mr. Bear comments using one of four sentence types: finite clauses using the *copula* (5), *control* sentences (6), *unraised* sentences (7), and *raised* sentences without an experiencer-phrase (8). Following Becker, *seem* and *appear* are used as the two raising verbs, and *like* and *hate* as the two control verbs.

	True Test Items	False Test Items
(5)	The dog really is white.	The dog really is purple.
(6)	The dog really likes to be white.	The dog really likes to be purple.
(7)	It really seems that the dog is purple.	It really seems that the dog is white.
(8)	The dog really seems to be purple.	The dog really seems to be white.

Table 1: Example sentences for the four experimental conditions

[3] It is interesting to note that all children who correctly answer the final pre-item question have shown evidence of correctly comprehending at least one obligatory control verb.

The word *really* was included in each test item, both to emphasize the difference between appearance and reality, and to draw the child's attention to the matrix verb, potentially discouraging him from ignoring the matrix verb entirely in favor of the embedded clause.

Each condition was tested eight times (each scenario twice), with four each of true and false items, for a total of 32 test sentences. The order of presentation for these items was pseudo-randomized such that children were not tested on the same condition more than twice in a row. Sentences were read twice before the child responded, and children's response justifications were written down before moving to the next test item.

Fifty children were tested, with 10 children in each one-year interval from age three to age seven (Table 2).

Age Group	#	Mean Age	Youngest	Oldest	M	F
3	10	3.64	3.21	3.97	3	7
4	10	4.37	4.02	4.90	6	4
5	10	5.47	5.07	5.99	5	5
6	10	6.53	6.12	6.93	7	3
7	10	7.55	7.13	7.92	6	4
Total	50	5.51	3.21	7.92	27	23

Table 2: Details on child participants

3. Results

3.1 *Data*

Group data for all conditions appears below in Table 3.

Age Group	Copula	Control	Unraised	Raised	Raised -UnR
3	99%	100%	75%	3%	2%
4	100%	100%	70%	36%	46%
5	100%	100%	84%	34%	45%
6	100%	99%	85%	68%	86%
7	100%	98%	80%	71%	84%

Table 3: Data for all condition across all age groups

3.2 *Copula-Condition*

All 50 children performed above chance on the copula-condition (minimum 7 of 8 items correct). This near perfect performance establishes that children have no general difficulties with either the task demands or the test materials. Importantly, the addition of *really* worked to distinguish the difference between appearance and reality for the children

as its inclusion eliminated the over-whelming errors we found during pilot testing of the copula-condition without *really*.

3.3 *Control-Condition*

Just as with the copula-condition, all 50 children scored above chance on the syntactic control condition. These results confirm that children do not treat syntactic control as raising. If children treated a control sentence like (6) as a raising sentence such as (8), they should perform at below chance levels (i.e. consistently answer incorrectly). Yet, children were found to provide consistently correct answers. What then to say about the control-as-raising analysis Becker found in the first experiment? It would appear this is nothing more than children willingly extending animacy to inanimates, that is, children taking the inanimate subjects to be sentient and thus licit controllers. [4]

3.4 *Unraised-Condition*

Some of the younger children have trouble with the unraised expletive-*it* construction, a finding that meshes well with previous experimental investigations of children's comprehension of unraised forms. In the current experiment, using materials very similar to Becker (2006), 40% of the 4 year-olds perform at or below chance on the unraised forms, a number that matches closely with the 30% of 4 year-olds that Hirsch and Wexler (2007) found to fail on unraised forms.[5] Becker's finding of 78.3% accuracy on raising in her second experiment therefore needs to take into account that many of these very children do not know the meaning of the raising verbs in their unraised form, raising serious questions about claims of children's early comprehension of raising without an experiencer.

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[4] This claim is strongly suggested by children's justifications for accepting the control sentences with inanimate subjects (Becker 2004):

Test item: # The bucket wants to be in the sandbox
Child: I think the bucket should be in the sandbox.
Investigator: But do you think the bucket could want to be in the sandbox?
Child: I think so. (age 3;11)

Test item: # The flower wants to be pink
Child: And the bees want to eat them!
Investigator: Do you think the flower could want to be pink?
Child: Yes, and green too! (age 3;1)

[5] Hirsch and Wexler's (2007) unraised forms do differ from the current test sentences in that they included an experiencer-phrase.

3.5 *Raised-Condition*

While some younger children had difficulties with the unraised sentences, the vast majority of children younger than six years of age (86.7%) failed to achieve above chance comprehension on the raised-condition. Table 3 clearly shows that children had much greater difficulty with the raised sentences compared to their unraised counterparts. Indeed, even if one only considers those children who scored above chance on the unraised condition, scores on the raised-condition are still extremely poor until around age 6 (rightmost column in Table 3).

Poor performance on the sentence involving subject-to-subject raising is not due to children randomly guessing. As Figure 2 shows, of the children who did not score above chance on the raised-condition, 85% scored below chance (maximum 1 of 8 items correct). This is consistent with a copula-analysis, since substitution of the copula for the raising verb leads to consistently opposite truth-value judgments. What this means is that once children are made aware of the appearance-reality dichotomy, in this case through the use of the modifier *really* and verified by means of the copula-condition, neither of which was employed in the original Becker (2006) study, children do indeed use a copula-analysis for raised sentences. This result is understandable under UPR as an adopted strategy on the child's part to deal with an otherwise ungrammatical structure.

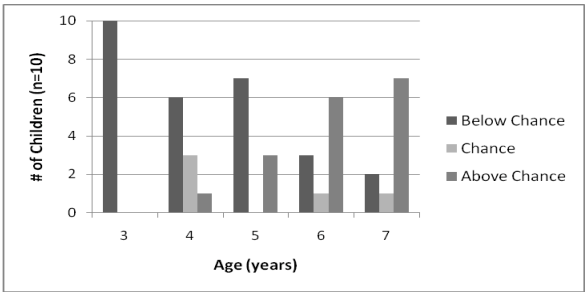

Figure 2: Breakdown of performance on the raised-condition

Children's response justifications further support the use of a copula-analysis of raising. For example, when D. (age 3;10) is asked to judge Mr. Bear's statement *the dog really seems to be purple* (false for adults), he incorrectly responds "No, he's not purple. In real life he's white." Such a response only makes sense if D. is applying a copula-analysis to arrive at an interpretation of the raising sentence meaning *the dog really is purple.*

4. Brief Discussion

4.1 *Results on Raising Compared to Past Findings*

The results obtained here indicate that once important methodological concerns are addressed, children show delayed comprehension of raising without an experiencer. Unable to compute an adult raising interpretation, children may use a copular strategy. UPR, but not UFH, correctly predicts children should find such raising structures ungrammatical, while still allowing the compensatory strategy. Further support for UPR is the age of acquisition for raising in this experiment, which matches that for raising over an experiencer and passives (Hirsch and Wexler 2007).

4.2 *Role of* Really

One of the changes made here to the original Becker study was the addition of *really* to all test sentences. Despite the drastically different findings for the raised-condition between Becker and ourselves, it is apparent that *really* was not the reason children suddenly no longer comprehend raising. Note that *really* posed no problem for 3-5 year-old children in the *copula, control,* or *unraised*-conditions, and no problems at all for 6-7 year-old children. If *really* were the cause for younger children not comprehending raising, it would have to be through an interaction that *only* applied to the *raised*-condition, in *only* the 3-5 year-old children. This explanation does not seem sensible.

5. Conclusion

This paper discusses children's comprehension of raising sentences without an experiencer phrase. Our data suggest that children are delayed in the comprehension of these structures, a finding that is consistent with the predictions of UPR, but not UFH. Finally, we suggest that children can make use of a copular strategy when faced with raised structures without an experiencer phrase, and that it was use of this strategy that misled Becker to her original claims of good raising comprehension.

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