Move over, Control freaks:
Syntactic Raising as a cognitive default

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1   Introduction: Raising and Control

Raising (R) and Control (C) structures constitute a case in which a single surface string may map onto one of two distinct underlying structures. In the utterances below, a matrix DP is either "raised out of" an embedded CP, as in the (a) forms, or is "controlling" PRO in the embedded CP, as in the (b) forms.[1]

(1)   Gracen$_i$ gorped...

    a. ...[t_i to drink wine]   Subject Raising: *seem, tend*

    b. ...[PRO$_i$ to drink wine]   Subject Control: *try, claim*

(2)   Gracen gorped Zana$_j$...

    a. ...[t_j to drink wine]   Raising-to-Object: *want, need*

    b. ...[PRO$_j$ to drink wine]   Object Control: *ask, tell*

PRO carries its own theta-role distinct from that of the matrix DP it is co-referential with, but trace (the result of movement) does not. As a result of this difference in theta-marking, R verbs show a wider range of allowable syntactic and semantic behaviors than do C verbs. These are illustrated here with R-to-Object (RO) and Object C (OC) verbs, but the same distinctions hold with S(ubject) R and S(ubject) C verbs.

For instance, RO verbs may felicitously embed any clause which is itself internally felicitous, but the DP subject embedded under OC verbs must be animate.

(3)   Gracen wanted/needed/#asked/#told *the wine* to be red

Likewise, RO verbs may grammatically embed clauses with expletive subjects, but OC verbs cannot.

(4)   Gracen wanted/needed/*asked/*told *there* to be more wine glasses

Finally, RO utterances maintain synonymy regardless of whether the embedded clause is active or passive, but OC utterances do not.

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[1]These representations (*t* vs. PRO, movement, etc.) are controversial but not crucial. The behavioral distinctions discussed here hold, regardless of the adopted theoretical model.

(5)   a. Gracen wanted/needed Zana to be taken by Mia (= ...Mia to take Zana)

      b. Gracen asked/told Zana to be taken by Mia (≠ ...Mia to take Zana)

The ramifications of these "surface same, structure different" verb classes are numerous, but in this paper I will focus on how they bear on learnability in child language and on adult derivational economy.

1.1   Raising, Control, and Learnability

For many years, researchers in first language acquisition (L1A) have assumed that there is no (direct) negative evidence in the input. As a result, learners should follow the *Subset Principle*—that is, they should initially posit the most restrictive grammar and only change it given (positive) evidence which that grammar cannot accommodate (see Becker, 2005, 2006, 2009, for discussion). Because C verbs are syntactically and semantically more restrictive than R verbs, the Subset Principle predicts that children should assume a C analysis of a novel verb in an ambiguous frame (e.g. *Zana gorps Gracen to wash the dishes*). If that assumption is false, it can be countered with positive evidence in the input—for instance, co-occurrence of the same verb with an embedded inanimate or expletive DP subject.

However, as the data I will present shows, children do not seem to behave in this fashion; indeed, they instead initially appear highly willing to assign verbs to the R class. This suggests that we may need to rethink some long-accepted models of language learning.

1.2   Economy of Derivation: Merge (C) vs. Move (R)

The Minimalist Program (Chomsky, 1995) takes as one of its guiding principles the notion that derivations are driven by considerations of economy. This begs the question of which is more economical: C (which merges an extra item—PRO—but does not entail movement) or R (with the opposite configuration). Chomsky (1995) and Hornstein (2001) argue on conceptual and empirical grounds that Merge is more economical, but Shima (2000) claims that Move is, and supporting Shima's view are experimental results showing lower reactions times and fewer errors given NP-movement gaps compared to PRO gaps (McElree and Bever, 1989).

My data also supports the second view, given the fact that adults occasionally judge C verbs appearing in R environments to be acceptable. The patterns in adult judgments also suggest that R and C may form a continuum, rather than a dichotomy or a single class.

1.3   Raising as a Default

In this paper, I will claim that *for both children and adults, Raising is the "elsewhere case."* R structures, which entail fewer theta-roles, carry a lower cognitive load than C structures. As a result, they are acquired first in L1A, and constitute a default into which C structures may be coerced (sometimes quite easily) for adult speakers. This claim has ramifications for current attempts at unifying the verb classes theoretically, as well as for our understanding of verb learning.

2 Acquisition of RO and OC

In this section I will present several experiments exploring the issue of when children "acquire" RO and OC constructions.

2.1 Experiment 1a: want, need, ask, tell (Kirby, 2009)

Method. In Experiment 1a, I used a truth-value judgment task (TVJ; Crain and McKee, 1985; Gordon, 1996) to examine children's comprehension of RO and OC verbs.

The participants were 32 normally-developing monolingual English-speaking children. The 4-year-old group consisted of 8 boys and 8 girls, with a mean age of 4;6 (range: 4;1.15–4;11.12). The 5-year-old group consisted of 7 boys and 9 girls, with a mean age of 5;5 (range: 5;0.18–5;11.15). Participants were recruited around Chapel Hill/Durham, NC, and received a token gift for participating.

All test items had a pronoun matrix subject (to reduce processing load) and a lexical NP embedded subject and object. Each child heard either *want/ask* or *need/tell* items with embedded active (6 items) and embedded passive clauses (6 items). The order of presentation was counterbalanced across participants.

(6) *Example stories (1a): Active RO and OC*
- a. RO: Tigger talked to Winnie the Pooh and said, "Patrick is having a really bad day and you should cheer him up. I think a kiss would make him happy, but I don't want to kiss him. Will you go give him a kiss?"

   What did Tigger do? ⇒ *He wanted Winnie the Pooh to kiss Patrick (T)*
- b. OC: The farmer had lots of animals to take care of. He was really busy! One day, he asked his friend the policeman, "I'm really busy. Can you help me go comb the horse's hair?" The policeman said, "Sure. How do I do it?" The farmer said, "It's easy. Just comb out the tangles in his tail."

   What did the policeman do? ⇒ *He asked the farmer to comb the horse (F)*

(7) *Test items and target answers (1a): Active RO and OC*
- W: He wanted Winnie the Pooh to kiss Patrick (T)

  She wanted the policeman to stop the dog (T)

  He wanted the hippo to rub the lion (F)
- A: He asked the farmer to comb the horse (F)

  She asked the sheep to call the zebra (F)

  He asked Dora to visit the doctor (T)
- N: He needed Clifford to feed the cat (T)

  He needed the giraffe to see the doctor (F)

  He needed the cat to bite the dog (F)

T: He told Elmo to draw the pig (F)

He told the pig to chase the goat (T)

He told Kermit to walk Clifford (T)

(8) *Example stories (1a): RO and OC embedded passives*

RO: Winnie the Pooh said to Tigger, "Somebody should call Elmo and invite him over to play with us. Do you have his telephone number? Can you call him up?" Tigger said, "Yes, I can call Elmo," and he went to call him and invite him over.

What did Winnie the Pooh do? $\Rightarrow$ *He needed Tigger to be called by Elmo* (F)

OC: Elmo said to Cookie Monster, "Dora really loves hugs. Can you go and hug her? She'll give you a big hug back." Cookie Monster agreed, and went and gave Dora a big hug.

What did Elmo do? $\Rightarrow$ *He asked Dora to be hugged by Cookie Monster* (F)

(9) *Test items and target answers (1a): RO and OC embedded passives*

W: She wanted the tiger to be tickled by the bear (T)

She wanted Clifford to be drawn by Patrick (T)

He wanted the horse to be seen by the farmer (F)

A: He asked Dora to be hugged by Cookie Monster (F)

She asked the cat to be licked by the dog (F)

He asked the goat to be washed by the cow (T)

N: He needed Clifford to be fed by Shrek (T)

He needed Tigger to be called by Elmo (F)

She needed Cookie Monster to be photographed by Elmo (T)

T: He told the horse to be ridden by the bear (F)

She told the policeman to be sniffed by the dog (T)

He told the cat to be scratched by the dog (F)

Results. The data was analyzed by age group. A series of logistic regressions (with the standard error adjusted for multiple observations within subjects) was performed to compare the number of correct (adultlike) responses per age group to a chance level (i.e., 50%).

Table 1: Child Comprehension (Percent Correct) of RO/OC and Passive Utterances

Age	RO	OC	RO-EP	OC-EP	Matrix Passive
4	87.5*	81.3*	75*	50	64.6
5	91.2*	91.2*	79.2*	64.6*	79.2*

$*p < 0.01$

For the active items, this analysis indicated that both age groups performed above chance on both RO and OC verbs (4-RO: $z = 4.26$, $p < 0.0001$; 5-RO: $z = 5.08$, $p < 0.0001$; 4-OC: $z = 3.4$, $p = 0.0007$; 5-OC: $z = 3.93$, $p < 0.0001$) and that 5s did not perform significantly better than 4s (RO: $z = -0.69$, $p = 0.4915$; OC: $z = -1.25$, $p = 0.2123$). 4s did slightly, though not significantly, better on RO than OC items ($\chi^2 = 1.12$, $df = 1$, $p = 0.2902$).

Now we turn to the embedded passive (EP) items. Only 5s interpreted OC-EPs significantly above chance (4: $z = 0.00$, $p = 1.0000$; 5: $z = 1.99$, $p < 0.0461$), but both 4s and 5s interpreted RO-EPs significantly above chance (4: $z = 3.30$, $p = 0.001$; 5: $z = 4.41$, $p < 0.0001$). Moreover, in an additional task with the same participants, 4s were at chance for comprehending matrix passives (*The pig was kissed by the goat*), and success on RO-EPs and matrix passives was not significantly correlated ($r^2 = 0.076$, $p = 0.1273$).

Discussion. Given this pattern of performance, it appears that at least some of the time, children analyzed OC utterances as RO (i.e., by accepting items that they should be rejecting). This data dovetails with results from a sentence judgment task by Becker (2009), in which 3- and 4-year-olds accepted SC verbs appearing with inanimate and expletive subjects (*the door tries to be purple, it's trying to be raining*). Becker concluded that children were coercing SC verbs into a SR analysis, in which the C verbs had a modal interpretation of FUTURE/POTENTIAL. Taken together, these findings suggest that the R structure may be an initial "default" which children assume, given a verb for which they do not yet have an adultlike representation.

Notice that these patterns run contrary to the predictions of the Subset Principle: children *don't* appear to initially assume a C analysis for novel verbs, and may actually do the opposite. But contrary to earlier assumptions, not using the Subset Principle may actually be the wiser learning strategy. As we will see below, the adult input may be too impoverished to provide children with the kind of data generally assumed to be necessary to correct the false hypothesis that a novel verb belongs to the C class.

2.2 Experiment 1b (In progress)

Experiment 1b is an attempt to replicate and extend the findings of Experiment 1a, using younger participants and a larger number of more well-crafted test items. So far, participants include 8 children (ages 3;7–5;3) recruited from UBC preschools. The task is a TVJ, and test items are similar to those in Experiment 1a, with the following changes. First, all NPs have the form *the X* (no pronouns or proper nouns are used). Furthermore, all embedded-passive items with target-false answers are such that if children interpret the embedded passives as active clauses, they should incorrectly accept these items.

Children hear a total of 16 test items: each of 4 verbs (*want, ask, need, tell*) appears in 2 target-true and 2 target-false utterances. Children ages ≤4;0 are tested only on the active items; children ≥4;1 hear only embedded-passive items. The order of presentation is counterbalanced across participants.

(10) *Example stories (1b): Active RO and OC*
   RO: The man had a goat. One day the man was really busy, so the man talked to the little girl and said, "I need help. Can you feed my goat? The goat is really hungry." The little girl said, "No, I don't like goats at all, so I don't want to."

   What did the man need? ⇒ *The man needed the girl to feed the goat* (T)
   OC: The pig asked the jaguar, "Who should I draw a picture of?" The jaguar said, "Well yesterday, I drew pictures of the duck, but that wasn't fun. I think you should draw some pictures of the bull instead."

   What did the jaguar do? ⇒ *The jaguar told the pig to draw the duck* (F)

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(11) *Test items and target answers (1b): Active RO and OC*

W: The rooster wanted the jaguar to kiss the horse (T)

The girl wanted the man to stop the dog (T)

The buffalo wanted the rhino to rub the duck (F)

The rooster wanted the ram to dress the bull (F)

A: The dog asked the ram to visit the doctor (T)

The goat asked the wolf to drive the pig (T)

The girl asked the man to comb the horse (F)

The bull asked the rooster to call the duck (F)

N: The man needed the girl to feed the goat (T)

The hippo needed the duck to help the pig (T)

The wolf needed the ram to tag the duck (F)

The man needed the jaguar to bite the rhino (F)

T: The donkey told the buffalo to chase the hippo (T)

The man told the girl to watch the rhino (T)

The jaguar told the pig to draw the duck (F)

The rooster told the ram to walk the dog (F)

(12) *Example stories (1b): RO and OC embedded passives*

RO: The dog was really tired, and was taking a nap on the couch. The pig needed to sit on the couch to watch TV. So the pig said to the buffalo, "I need to sit down on the couch so I can watch TV. Buffalo, can you move the dog?"

What did the pig need? ⇒ *The pig needed the buffalo to be moved by the dog* (F)

OC: The horse missed the bus to school. The horse didn't want to be late, so the horse asked the rhino, "Rhino, can you drive me to school?" The rhino said, "I don't have a car, but the pig does. You should make the pig take you."

What did the rhino do? ⇒ *The rhino told the horse to be taken by the pig* (T)

(13) *Test items and target answers (1b): RO and OC embedded passives*

W: The goat wanted the horse to be tickled by the wolf (T)

The wolf wanted the rooster to be lifted by the horse (T)

The rhino wanted the donkey to be surprised by the pig (F)

The hippo wanted the buffalo to be reminded by the duck (F)

A: The rooster asked the goat to be washed by the bull (T)

The jaguar asked the ram to be taught by the duck (T)

The hippo asked the wolf to be hugged by the donkey (F)

The girl asked the cat to be licked by the dog (F)

N: The man needed the dog to be fed by the girl (T)

The rhino needed the rooster to be photographed by the ram (T)

The goat needed the jaguar to be called by the donkey (F)

The pig needed the buffalo to be moved by the dog (F)

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T: The rhino told the horse to be taken by the pig (T)

The man told the girl to be sniffed by the dog (T)

The buffalo told the wolf to be scratched by the rooster (F)

The bull told the duck to be ridden by the horse (F)

The preliminary results show children in both tasks performing as well—or better—on RO than OC items. I have not yet performed any statistical analysis on the responses, but as you can see in Table 2, each child has a higher percent correct for RO items than for OC items.

Table 2: Experiment 1b: Child Comprehension on RO/OC Utterances

Subject (Age)	Task	RO Correct	OC Correct
AS (3;7)	Active	100%	50%
NS (4;0)	Active	63%	63%
AB (4;6)	Passive	63%	63%
MD (4;8)	Passive	63%	38%
RM (4;9)	Passive	50%	50%
HC (4;10)	Passive	50%	13%
NP (4;11)	Passive	100%	75%
MD (5;3)	Passive	75%	75%

3 Control Verbs with Expletive Arguments

In this section I discuss naturalistic and experimental evidence that refutes the claim that C verbs always theta-mark their arguments. Anecdotal evidence suggests that adult semantic restrictions may be more fluid: informal or metaphorical speech may allow C verbs to appear with inanimate arguments (*The lid doesn't wanna come off, This book keeps trying to close*). Likewise, Postal and Pullum (1988) present a variety of utterances in which OC verbs grammatically appear with expletive arguments (e.g. (14), their (28), p. 645).

(14)   a. The Lord stopped it from raining.

b. They kept it from becoming too obvious that she was pregnant.

c. The mayor prevented there from being a riot.

Correspondingly, my data suggests that adults do not uniformly reject utterances in which C verbs appear with expletive arguments (*There tried to be 5 chairs at the table*). This contradicts the received syntactic wisdom and indicates that adult input may actually serve to complicate learning task for children.

3.1 Spontaneous Use: Corpus Study

To examine how consistent the theta-marking requirement is for C verbs in adult naturalistic speech, I carried out a small corpus study using all the available American English corpora in the CHILDES database

(MacWhinney, 2000). Using the Clan program, I conducted searches for the strings "*it/there* + PROMISE/TRY to" and "ALLOW/FORCE + *it/there* to", and then examined the results by hand.

There were no examples of these verbs appearing with expletive *there* or *it*, but there were some occurrences of inanimate *it* appearing as the subject of the verb *try*, in both child (15) and adult (16) speech.

(15) *Child usage: Inanimate 'it' + 'try'*

    a. it's [=motorcycle] trying to go byebye. (2;9)

    b. it's [=toy car] trying to play #bus. (2;9)

    c. it [=motorboat] tries to tip over. (3;8)

    d. it's [=door] flashing and trying to get me in there Mommy (4;7)

    e. it's [=balancing beam] trying to be hard! (5;7)

    f. it feels like it's [=black base] trying to push you away. (9;10)

(16) *Adult usage: Inanimate 'it' + 'try'*

    a. you can feel it [=metal] trying to pull your magnets down. (file briet3)

    b. feel it [=yellow circle] trying to flip over? (file geoet3)

    c. it's [=page in book] trying to rip (file zenbr1)

In these utterances, it seems that speakers are using the verb *try* with a semantically bleached (i.e. coerced) meaning similar to that posited by Becker (2009) in the experiment discussed in §2.1 above. These uses are clearly dependent on a felicitous context—for instance, Becker's participants accepted sentences like *It wants to be raining* when presented with a picture of dark clouds. In other words, allowing C verbs to appear in R-like syntactic environments may correlate with coercing them into a modal-like use under the right real-world circumstances.

Verbal coercion is documented elsewhere in the adult literature. Gentner and France (1988) found that given a semantically odd sentence like (17), adults will alter the meaning of the *verb*, rather than assuming a new meaning for the *nouns*.

(17) *The flower kissed the rock.*

    a. *flower, rock* ≠ 'flower-like/rock-like person'

    b. *kiss* = 'bend over and touch; press (petals) against'

In short, the frame in which a verb appears exerts considerable force over the interpretation of that verb, and argument structures and verb meanings are highly correlated for adults (e.g. Gillette et al., 1999) as well as children (e.g. Fisher et al., 1994). The coercive effect of "frame compliance" has also been illustrated in an act-out task by Naigles et al. (1993). When presented with a known verb in a novel frame, children ages 2–4 appeared to forge a composite meaning for the verb which incorporated the phrasal meaning of that argument structure. For instance, intransitive verbs in transitive frames were interpreted as causatives, likely on analogy with attested causative verb alternations like *The vase broke/The boy broke the vase*.

(18) *The lion goes the zebra* ∼ 'The lion causes the zebra to go'

The process of verbal coercion that allows for deviant *semantics* is thus crucially linked with deviant *syntax*, just as we have seen in the C → R cases. Moreover, there is an attested SC/RO alternation for verbs like *want* and *prefer* (19), and *hope*, but no widely-attested similar alternation between SC/SR.[2]

(19)   a. I_i want PRO_i to be warm / I want it_i t_i to be warm in the house

     b. I_i prefer PRO_i to eat cake / I prefer $there_i$ t_i to be no cake at home

Given that SC/RO is a familiar alternation, but SC/SR is not, it seems likely that speakers would be more willing to drop a C verb's theta-role in object than in subject position. In short, we predict that OC verbs appearing with expletive objects will be judged as more acceptable than SC verbs with expletive subjects.

(20)   Prediction: *allow/force* + expletive > expletive + *promise/try*

Since the corpus study did not yield any examples of these verbs appearing with expletive arguments, I conducted several judgment tasks to test this prediction.

3.2   Experiment 2a: promise, try, allow, force

Method. Experiment 2a was a sentence judgment task. 35 native English-speaking adults in UBC linguistics courses received course credit for participating. The task was administered via an electronic questionnaire, in which participants were asked to make Likert scale judgments (*weird* 1...6 *okay*, "for English as it is usually spoken") on the test items appearing in Table 4 (following page).[3] The order of presentation was randomized across participants.

Results/Discussion. None of the verbs was judged as categorically acceptable or unacceptable with an expletive argument, but trends in acceptability ratings were consistent with the hypothesis: i.e., when co-occurring with expletive arguments, *allow* and *force* were judged as being more acceptable than *promise* and *try*. Table 3 presents the results by verb, in two ways. "OK Responses" are the percentage of items containing that verb which received a rating of 4, 5, or 6. The "Avg. Rating" reflects the mean response (out of 6 points) for all items containing that verb.

Table 3: Experiment 2a Judgments by Verb

Type	Verb	"OK" Responses	Avg. Rating (of 6)
OC	allow	67.9%	4.071
	force	54.3%	3.571
SC	promise	47.1%	3.293
	try	12.9%	1.957

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[2]With the possible exception of verbs like *begin* and *promise*: *Gracen began/promised to read* ∼ *It began/promised to rain.*

[3]Participants saw either animate (N=18) or inanimate (N=17) stimuli. However, as there did not appear to be any obvious effect of animacy, I will abstract away from this issue here.

Participants in Experiment 2a judged expletives as being "less ungrammatical" in object than in subject position. This is consistent with the observation that subject position seems to be crosslinguistically privileged (Greenberg, 1963; Li and Thompson, 1976; Keenan, 1985; Dowty, 1991). Such privilege may result in the restriction on theta-marking being more stringent (and/or protected) for subjects than for objects.

The relative willingness to drop an object theta-role also give us a possible window into how the SC/RO alternation arose, diachronically. SC/RO verbs may have originated as verbs with the more common SC/OC alternation (cf. *Gracen asks to wash the dishes/Gracen asks Zana to wash the dishes*), but over time, they lost their object theta-role. The OC → RO coercion that participants accepted (to some extent) in this task may represent the first step in the historical process.

Table 4: Experiment 2a Judgments (out of 6) by Item

Item	Avg. Rating
The (icing/baker) allowed it to be a surprise that the cake was chocolate	3.686
The (experiment/researcher) allowed it to be proven that red wine is healthy	3.914
The (keg/caterer) allowed there to be enough beer for the event	4.229
The (schedule/coach) allowed there to be another practice	4.457
The (prerequisites/dean) forced it to be necessary to study a foreign language	3.743
The (ultrasound/doctor) forced it to be shown that the tumor was cancerous	2.657
The (budget/governor) forced there to be another tuition increase	4.343
The (sale/manager) forced there to be a discounted price	3.543
It promised to be required that every (tent/camper) come with a sleeping bag	2.314
It promised to be necessary that the (museum/professor) earn more money	1.914
There promised to be a lot of (shells/surfers) at the beach	4.400
There promised to be several (articles/speakers) on the topic	4.543
It tried to be encouraged that the (play/marathoner) only run for two hours	2.571
It tried to be possible for the (machine/cashier) to accept credit cards	1.486
There tried to be enough (textbooks/teachers) for the course	1.943
There tried to be 5 (chairs/customers) at the table	1.829

3.3 Experiment 2b: try, refuse, tell, urge (In progress)

Experiment 2b is an attempt to replicate and extend the findings from Experiment 1b, using better verb exemplars and a wider range of constructions. As before, the task is an electronic questionnaire with scalar judgments. The verbs tested are roughly matched for frequency, with 1 higher-frequency (*try, tell*) and 1 lower-frequency (*refuse, urge*) verb each, from the SC and OC classes. The test items also include weather-*it* constructions.[4] So far, participants include 7 native English-speaking adults in UBC linguistics courses who received course credit for participating. Participants see half of the test items for each verb, and the order of presentation is randomized across participants.

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[4]Due to an oversight, the *tell/urge* weather-*it* items were omitted from the questionnaire.

Table 5: Experiment 2b Judgments (out of 6) by Item

Item	Avg. Rating
It (tried/refused) to be normal for the athlete to run 10km	1.714
It (tried/refused) to be obvious that everyone uses email	1.571
It (tried/refused) to be unusual that the professor assign homework	1.429
It (tried/refused) to be possible for the cashier to accept checks	1.143
There (tried/refused) to be 5 customers at the table	1.429
There (tried/refused) to be enough teachers for the course	1.571
There (tried/refused) to be several speakers on the topic	1.571
There (tried/refused) to be a lot of surfers at the beach	1.857
It (tried/refused) to be especially cold in November	1.857
It (tried/refused) to be bright enough to wear sunglasses	2.143
The nutritionist (told/urged) it to be true that red wine is healthy	1.714
The baker (told/urged) it to be a surprise that the cake was chocolate	2.286
The dean (told/urged) it to be obligatory to study a language	2.286
The doctor (told/urged) it to be clear that the tumor was cancerous	1.857
The coach (told/urged) there to be another practice	1.714
The caterer (told/urged) there to be enough beer for the event	1.714
The meteorologist (told/urged) it to snow 3 inches	1.714
The babysitter (told/urged) it to be time for bed	2.000

Initial results indicate a slight overall preference for *tell/urge* (OC) with expletive objects over *try/refuse* (SC) with expletive subjects. I predict that the observed difference between the two classes will grow as more participants are included. Acceptance of these kinds of utterances exhibits high levels of idiolectal variation; a small sample size can therefore quite easily skew the results in one direction or another.

4   Conclusions

The data presented here bear on a number of current issues. First and foremost, contrary to the accepted claim, so-called "control verbs" may not always theta-mark their arguments. For adult speakers, C verbs appearing with expletive arguments are at least moderately acceptable. Acceptability varies across verbs, predicates, and SC/OC lines, but these constructions are not judged to be categorically bad. Moreover, child speakers initially appear willing (if not biased) to interpret C verbs as R verbs.

These findings should crucially be considered in light of past and current attempts to unify R and C into a single (semantic or syntactic) verb class (e.g. Hornstein, 1999; see Kirby et al., 2010 for more discussion). I do not believe the data support our lumping the two verb types into one monolithic category, especially since the pattern of acceptability ratings given by adults in Experiment 2a was distinct for each of the verbs examined, as shown in the histograms below.

Histogram of try

Histogram of promise

Histogram of force

Histogram of allow
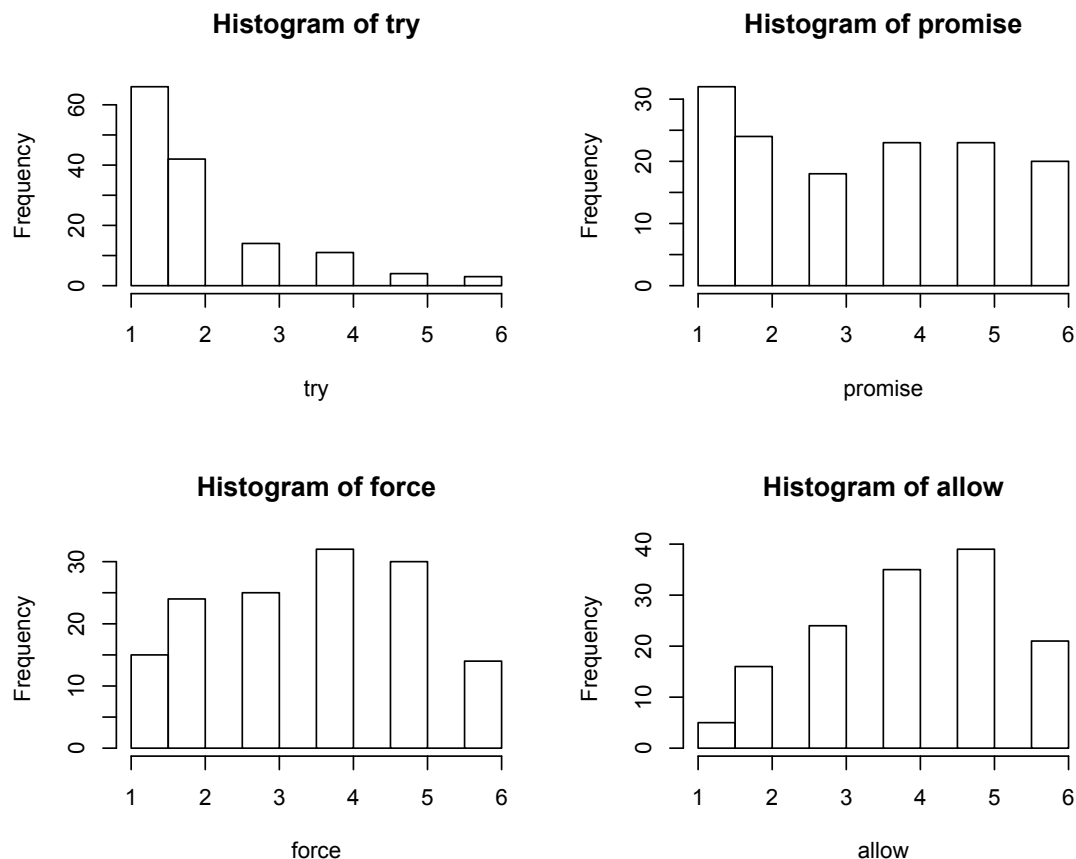
On the other hand, these verb classes clearly do not form a strict dichotomy. Instead, I propose that R and C form a fluid continuum, where any given verb occupies some *range* between true/pure R and true/pure C, and that membership in one class or the other is only set on an utterance-by-utterance basis. This suggestion receives some support from the long-standing observation that verbs like *begin* can act as both R and C verbs (Perlmutter, 1979; cited in Becker, 2006).

(21) R   C

     seem   *begin*   *allow*   *force*   *promise*   *try*
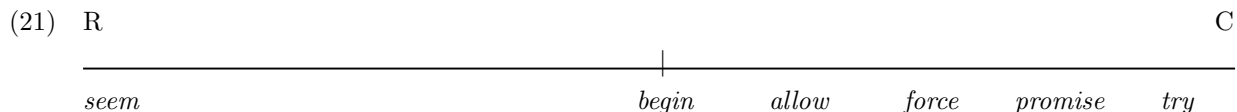
Given what we have seen here about how adults treat C verbs, the process of language learning cannot entail simply placing a novel verb in one category or another, perhaps on the basis of some "triggering data." Instead, learning must be a slow process of amassing enough information from multiple cues (including co-occurrence with expletive or inanimate subjects, and eventivity of the embedded predicate, as argued by Becker, 2005, 2006, 2009)—and tracking their co-occurrence frequencies across multiple exemplars—to ultimately determine *which portion of the continuum* a given verb occupies.

More generally, though, the data presented here suggests that R is highly accessible in the grammar, for both children and adults. Children perform better, earlier, on R than on C (contra claims by Hirsch and Wexler, 2007, among others), and both children and adults may allow R analyses for verbs that are traditionally assumed to belong to the C class (contra predictions of the Subset Principle). This in turn suggests that derivations containing trace/Move are more economical than those containing PRO/Merge.

Why should R be the default, and not C? It may come down to cognitive load, and the fact that removing a theta-role is (cognitively) easier than adding one. This idea receives support from data indicating that processing load is correlated with animate NPs for children (Goodluck and Tavakolian, 1982), and with theta-roles for adults (Ahrens and Swinney, 1995).

In GB (e.g. Chomsky, 1986), C verbs must be claimed to co-occur with PRO in order to maintain the Theta Criterion—the notion that there is a 1-to-1 correlation between thematic roles and DPs. But the Theta Criterion is a theory-internal requirement, and is certainly not necessitated by (extragrammatical) cognitive semantics. Indeed, a number of non-GB proposals (including Culicover and Jackendoff, 2001; LFG, e.g. Bresnan, 1982; HPSG, e.g. Pollard and Sag, 1994; and even some branches of Minimalism, e.g. Hornstein, 1999; again, see Kirby et al., 2010) abandon the Theta Criterion entirely. At the very least, the patterns seen in child and adult usage here suggest that this stipulation may be worth rethinking, if not reformulating or discarding. Interpreting C as R may equate to bleaching, dropping, and/or "stacking" multiple theta-roles on a single DP—something that our extragrammatical semantics can clearly handle, even at a young age.

Acknowledgments

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