Pseudo-scoping out of tensed clauses: cumulation vs. buildups

0. Introduction. Recent papers have argued that tensed clauses are not scope islands for universal quantifiers (Barker, 2022; Hoeks et al., 2022). One reason is that (1-a) allows a reading where, instead of a particular student responsible for every speaker's ride, the student can vary by speaker (henceforth, a *variation reading*). In contrast, (1-b) does not allow a varying reading.

(1) a. A student made sure that [every invited speaker had a ride].

   b. A student claimed that [every speaker had a ride].   ✗ $\forall > \exists$

Assuming tensed clauses are not scope islands for universals requires imposing some predicate sensitive restriction on scope taking, to rule out the variation reading in (1-b). Hoeks et al. (2022) propose that QR is only possible if the eventuality described by the quantification is in some intuitive sense ''build up to' over time by the individual cases of the quantification ("buildup approach"). The lexical semantics of *make sure* inherently requires such a buildup, but *claim* does not, resulting in the impossibility of QR in (1-b). This abstract offers a different explanation for (1): (1-a) doesn't in fact involve scope taking, but receives its variation reading through a cumulative inference (CI) ("cumulating approach"). (1-b) is impossible because tensed clauses are scope islands after all.

1. Evidence for cumulating approach. We propose that the cumulativity responsible for variation readings is not the prototypical kind involving a relation between two pluralities. Rather, CIs involve a cumulative contribution between the members of a subject plurality resulting in the truth of the embedded proposition (Harada, 2022). In (2), the predicate *make sure* licenses an inference combining the contributions of *Ann* and *Bea*, resulting in the truth of the embedded proposition: *that every problem was error-free*. Licensing this inference depends on the semantics of *make sure*. Crucially, CIs are not available with every embedding predicate when there's a conjoined subject: *claim* can't cumulate contributions together like *make sure*, as illustrated in (3).

(2) CONJOINED SUBJECT/VARYING INDEFINITE CONTEXT: *[Ann and Bea are teaching assistants. The professor asked the teaching assistants to review four homework problems. Ann made sure the first and second problems were error-free, but didn't look at the third and fourth problems. Bea made sure the third and fourth problems were error-free, but didn't look at the first and second problems.]*

  {Ann and Bea/A teaching assistant} made sure that every problem was error-free.

(3) CONJOINED SUBJECT/VARYING INDEFINITE CONTEXT: *[Ann and Bea are teaching assistants. The professor asked the teaching assistants to review four homework problems. Ann claimed that the first and second problems contained errors, but had no issues with the other problems. Bea claimed that the third and fourth problems contained errors, but had no issues with the other problems.]*

  {#Ann and Bea/#A teaching assistant} claimed that every problem contained errors.

This predicate-sensitivity of CIs is not limited to *make sure* and *claim*; it also correlates with apparent inverse scope. We ran a series of acceptability rating tasks to show that the same predicates which license CIs give rise to apparent inverse scope. The task involved 10 predicates: 5 which license CIs (*make sure, confirm, establish, prove, verify*—henceforth, *cumulating predicates*) and 5 which don't license CIs (*claim, notice, confess, heard, believe*—*non-cumulating predicates*). Sample contexts for conjoined subject and varying indefinite conditions are illustrated in (2)–(3) with the bolded target sentences. Controls involved non-conjoined/non-varying indefinites that simply referred to a single individual. Figure 1 illustrates a higher acceptability of CIs with
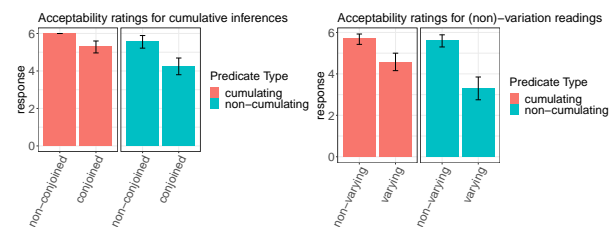

Figure 1: Left: CIs with plural subjects. Right: Variation readings with singular indefinites.

plural subjects (left-hand plot) and variation readings with indefinites (right-hand plot) for cumulating predicates (red bars) compared to non-cumulating predicates (blue bars). The significance of this interaction in mixed effects models supports the empirical generalization in (4). These results can be made sense of if tensed clauses are scope islands after all and apparent wide scope is illusional, derived indirectly via CIs, which cumulate the contribution of each witness of the indefinite.

(4)   THE CUMULATING CORRESPONDENCE: A clause embedding predicate will license variation readings (i.e. apparent wide scope of a universal) whenever the predicate licenses CIs.

2. Evidence against buildup approach. Apart from (1), the crucial empirical argument for the buildup approach in Hoeks et al. (2022) is that the variation reading should become available for embedding predicates like *claim* (and others, like *heard, found, become aware* and *believe/come to believe*—hencerforth *buildupicle predicates*), when additional cues force a buildup reading. The two manipulations given are (i) adding a buildup adverbial like *by 8pm*, and (ii) using perfect aspect. This is illustrated by Hoeks et al. (2022) in (5) which they report licenses a variation reading.

(5)   By 8pm, a student had claimed that every professor had a ride.   ✓∀ > ∃

Hoeks et al. (2022) furthermore report that some other embedding predicates do not allow scope taking even with these cues to buildup, for example *is confident, is sure, is aware, is convinced, realize* and *remember* (henceforth *non-buildupicle predicates*). We ran an acceptability rating experiment to test these predictions. The task compared buildupicle and non-buildupicle predicates in buildup and non-buildup contexts. Sample contexts and target sentences are provided in (6)–(7). Controls involved non-varying indefinites that simply referred to a single individual. Results are in Figure 2.
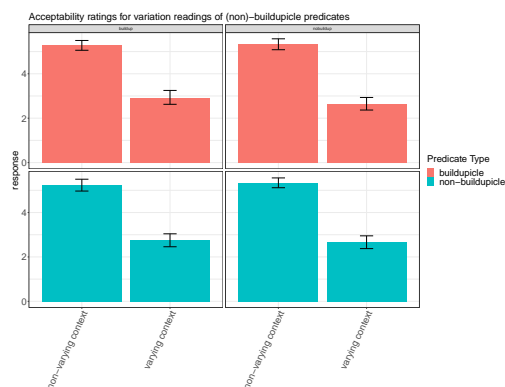

Figure 2: Left: Non-varying and varying indefinite contexts involving buildups. Right: Non-varying and varying indefinite contexts involving no buildup.

(6)   BUILDUP, VARYING INDEFINITE CONTEXT: *[Ann, Bea and Carol are students. During yesterday's talk, the speaker presented three theories in total. When the speaker presented the first theory, Ann claimed it was wrong. When the speaker presented the second theory, Bea claimed it was wrong. Finally, when the speaker presented the third theory, Carol claimed it was wrong.]* **By the end of the talk, a student had claimed that every theory was wrong.**

(7)   NO BUILDUP, VARYING INDEFINITE CONTEXT: *[Ann, Bea and Carol are students. At yesterday's talk, the speaker presented three theories. During the final discussion, Ann claimed the first theory was wrong, Bea claimed the second theory was wrong and Carol claimed the third theory was wrong.]* **A student claimed that every theory was wrong.**

Figure 2 illustrates no difference in acceptability for buildupicle predicates (red bars) compared to non-buildupicle predicates (blue bars) or between buildup (left-hand plots) and non-buildup contexts (right-hand plots). Buildipcle and non-buildupicle predicates are rated worse than non-varying controls and just as bad as the non-cumulating predicates from experiment 1. Thus, the empirical claim made by Hoeks et al. (2022) concerning (5) is not borne out. Variation readings are unavailable for these predicates in contrast to predicates that license CIs, which allow variation readings even without buildup cues, as shown in experiment 1. The cumulating approach dispenses with the need for QR to derive the variation reading, and in the process dispenses with imposing a buildup constraint on QR. The CI in some sense captures the intuition, however, that the truth conditions of (1-a) involve adding up the individual cases toward the overall reading.

References. Barker, C. (2022). Rethinking scope islands. In *LI* 53(4), 633-661. | Hoeks, M., Özyıldız, D., Pesetsky, J., Roberts, T. (2022). Event plurality & quantifier scope across clause boundaries. In *SALT* (Vol. 1, pp. 443-462). | Harada, M. (2022). *Locality effects in Composition with Plurals and Conjunctions* (PhD Thesis, McGill University). |