Pseudo-scoping out of tensed clauses: The case of cumulation[*]

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1. Introduction

This paper addresses whether tensed complement clauses impose a locality constraint and block quantifier raising (QR) of universal quantifiers.[1] This is shown in (1): the universal undergoes QR from inside the tensed clause and moves above the embedding predicate.

(1)   [... [every] ... embedding predicate $_{TP}$[... t ...]].

Due to the difficulties in assessing the relative scope between a universal quantifier and an embedding predicate, in the literature, it is common to use variation of an indefinite to detect where the universal takes scope. This is shown in (2), where now the universal quantifier undergoes QR from within the tensed clause above the subject indefinite.

(2)   [[every] [indefinite] embedding predicate $_{TP}$[... t ...]].

As an example, consider (3) with the embedding predicate *make sure*.

(3)   A student made sure that every invited speaker had a ride.   ✓$\forall > \exists$
        (Farkas and Giannakidou 1996:37)

In addition to a reading about a particular student, (3) licenses a weakened reading where the student varies by speaker—henceforth a 'variation reading'. Next, consider (4), with the embedding predicate *claim*.

[1]In this paper, I focus on the universal quantifier *every* but the same observations apply to *each*.

(4)   A student claimed that every professor was wrong.   ✗∀ > ∃

In contrast to (3), (4) doesn't license a variation reading—the sentence only receives a reading about a particular student who made a claim about all the professors. This raises an empirical puzzle: variation readings appear to be sensitive to the embedding predicate.

One response to the observed predicate sensitivity is to propose that tensed clauses do not block non-local QR per se, but only for certain predicates (Barker 2022, Hoeks et al. 2022). This amounts to the following claim: non-local QR is, in principle, possible and a mechanism available in the grammar, and we just need to understand why certain embedding predicates block it. Concerning (3) and (4), this would mean that *make sure* allows non-local QR but *claim* doesn't (for some yet undetermined reason).

In this paper, I propose that variation readings do not involve QR (Fox and Sauerland 1996). The case against QR rests on two arguments. First, in section 2, I show that QR is not general enough to handle all variation readings. This argument is made by drawing a parallel between universal quantifiers and negative indefinites. More specifically, I argue that both kinds of quantifiers license variation readings when embedded in a tensed clause, and QR only delivers the right truth conditions with universals. Second, I argue that an alternative analysis relying on cumulation better explains the observed predicate sensitivity of variation readings. This argument is made by drawing a parallel between variation readings and cumulation with plural subjects. In particular, in section 3, I explain what is meant by 'cumulation' and show that it illustrates the same predicate sensitivity as variation readings, suggesting that these two phenomena are connected. Then, in Section 4.1, I present an inferential analysis of cumulation with plural subjects which captures the predicate sensitivity. In Section 4.2, I extend this analysis to variation readings, and argue that they are the indirect result of cumulation. As a result, we gain a better understanding of variation readings through the lens of cumulation. Section 5 offers some concluding remarks.

2.   QR is not viable

With respect to variation readings, we observe a parallel between sentences containing embedded universals and those with embedded negative indefinites. Consider the context in (5a) with the target sentence in (5b).

(5)   a.   *[Ann, Bea and Carol were student volunteers for the open house. There were three tours so each student volunteer was responsible for overseeing one tour. Ann made sure that the first tour started on time, Bea made sure that the second tour started on time and Carol made sure that the third tour started on time.]*

        b.   A student volunteer made sure that no tour started late.   cf. (3)

In (5a), there is no one student who oversaw every tour yet the target sentence in (5b) is still felicitous in this context. This means the target sentence receives a similar weakened meaning as in (3) (i.e., a variation reading) when we replace the universal quantifier with a negative indefinite: (5b) is understood as involving variation of students by tours. The

emerging generalization then is a broader pattern of variation: despite the difference in quantificational force, variation readings are available with universal quantifiers and negative indefinites alike. In addition, the parallel between universal quantifiers and negative indefinites extends further than simply licensing variation readings. Consider (6a) with the target sentence in (6b) (going forward, '#' represents the lack of a variation reading).

(6)   a.   *[Ann, Bea and Carol are teaching assistants. Before yesterday's class, the teacher wrote three problems and asked the three TAs to each look over one problem. Ann claimed that the first problem was error-free, Bea claimed that the second problem was error-free and Carol claimed that the third problem was error-free.]*

      b.   #A teaching assistant claimed that no problem contained errors.   cf. (4)

The context in (6a) is similar to that in (5a) in the sense that no one TA made a claim about all the problems. However, now, the target sentence in (6b) is not understood as true: in contrast to (5b), (6b) does not license a variation reading. This suggests that variation readings with negative indefinites show the same predicate sensitivity as those with universal quantifiers; they are licensed with *make sure* but not with *claim*.

   If variation readings are available with embedded negative indefinites, this poses a challenge for a QR based approach; the reason being that QR can't capture variation with negative indefinites. A QR approach analyzes variation readings as a case of inverse scope. By replacing the embedded quantifier with a quantifier that resists taking inverse scope, like a negative indefinite (Beghelli and Stowell 1997), a variation reading shouldn't be available. Even if the negative indefinite were to undergo QR to a position above the subject indefinite, as illustrated by the LF in (7a), the resulting truth conditions correspond to an unattested reading. These truth conditions are provided in (7b).

(7)   a.   [no tour] λ_1 [a student volunteer made sure that $_{TP}$[t_1 started late]]

      b. $\neg\exists y$ [tour(y) $\wedge$ $\exists x$[student-volunteer(x) $\wedge$ make-sure(x, started-late(y))]]
           'there's no tour y s.t. there's a student volunteer that made sure y started late.'

As we can see, (7b) doesn't derive the right truth conditions for a variation reading. The truth conditions don't even ensure that the tours were on time. Consider a scenario where Bill and Diane do absolutely nothing to make sure the tours started on time but they also don't make sure the tours start late—they simply do nothing. The truth conditions for (7b) are satisfied in this scenario since Bill and Diane didn't make sure the tours started late. However, the sentence in (5b) is intuitively false in this scenario. What we see then is that the intended interpretation can't be derived by having the negative indefinite undergo QR to a position above the subject indefinite. This is in contrast to the examples with an embedded universal quantifier where QR is sufficient to derive the right truth conditions.[2]

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[2]It should be noted that a decompositional account of *no*, where it is analyzed as a universal quantifier plus negation, could help here if the universal takes wide scope and negation scopes within the tensed clause.

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To confirm these parallels between universal quantifiers and negative indefinites, we ran an acceptability rating experiment. Rather than focusing solely on the embedding predicates *make sure* and *claim*, we also tested 8 other embedding predicates. These 8 predicates consisted of 4 which we took to license variation (*prove, confirm, verify* and *establish*—henceforth, *make sure*-like predicates) and 4 which we took to not license variation (*confess, believe, notice* and *heard*—henceforth, *claim*-like predicates). In the experimental task, 22 participants were shown contexts where the indefinite varied, as in (5a), and were asked to rate the target sentence on a scale from 1 (completely unnatural) to 6 (completely natural). In the first condition, the target sentence contained a universal quantifier (i.e., *a student volunteer made sure that every tour started on time*). In the second condition, the target sentence contained a negative indefinite (i.e., *a student volunteer made sure that no tour started late*). Controls involved non-varying indefinites that referred to a single individual ('non-varying context'). The results are shown in Figure 1.
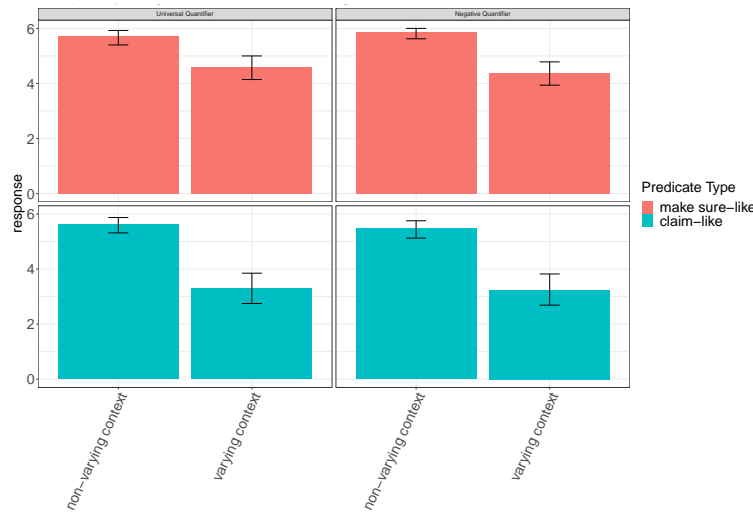

Figure 1: L: Acceptability ratings in non-varying & varying indefinite contexts with universal quantifier. R: Acceptability ratings in non-varying & varying indefinite contexts with negative quantifier.

The takeaway in Figure 1 is that both universal quantifiers and negative indefinites pattern in a parallel way and show the same predicate sensitivity. The results were analyzed using linear mixed effects models with predicate type (*make sure*-like vs. *claim*-like) and context (non-varying vs. varying) as fixed effects (including interactions) and random intercept and slopes by item (including interactions). For embedded universal quantifiers, there was a significant interaction between predicate type and context ($p = 0.0061$). For the negative indefinites, significance wasn't quite achieved for the interaction term between predicate type and context ($p = 0.078$), but an effect similar to the universal quantifiers was nevertheless present—as seen in Figure 1.[3] This data suggests that a QR based approach is

[3]We have since run a bigger experiment and the interaction term still didn't come out as significant but a trend in the right direction was still observed, similar to what was observed in this experiment. At the very least, both experiments seemed to confirm that variation readings are also available with negative indefinites.

not general enough. Variation readings are possible with both kinds of quantifiers but QR only delivers the right truth conditions when the embedded quantifier is a universal. For this reason, we want an alternative analysis which captures both cases using the same underlying mechanism. But what mechanism can capture both cases? I propose that the answer to this question lies in a better understanding of *make sure*-like predicates. More specifically, we need to understand what property of *make sure*-like predicates enables variation.

3.   The cumulation-variation correspondence

In the previous section, we observed a parallel between embedded negative indefinites and universal quantifiers insofar as both license variation readings; but only with certain embedding predicates. In this section, we establish another parallel, this time between sentences with singular indefinites in the matrix subject position (cf. (3)) and those with plural subjects. More specifically, we observe that the embedding predicates which license variation readings with singular indefinites also license a form of cumulation with plural subjects, suggesting a connection between the two phenomena. Thus, by connecting variation readings to cumulation with plural subjects, I argue that the predicate sensitivity of variation readings is in fact due to cumulation being predicate sensitive. This provides more explanatory power than QR, since a QR approach simply stipulates a predicate-by-predicate restriction on scope taking without explaining why certain predicates block non-local QR.

To understand what we mean by 'cumulation', consider (8). The target sentence, (8b), is true in the provided context under a reading that is weaker than the distributive reading one might expect. The cumulation we are concerned with reflects the fact that the source of distributivity, whatever it is, can be absent and the resulting truth conditions reflect certain inferential properties of the embedding predicate which allow us to combine Ann and Bea's contributions together. I will refer to these inferential properties as 'cumulative inferences' or simply as 'cumulation'.

(8)   a.   *[Ann made sure that speaker 1 and speaker 2 had a ride; but not speaker 3 and speaker 4. Bea made sure that speaker 3 and speaker 4 had a ride; but not speaker 1 and speaker 2.]*

       b.   Ann and Bea made sure that every speaker had a ride.

Now, turning to (9), we observe the predicate sensitivity of cumulation with plural subjects. In (9), the target sentence in (9b) is not perceived as true in the given context.

(9)   a.   *[Ann claimed that speaker 1 and speaker 2 were wrong; but not speaker 3 and speaker 4. Bea claimed that speaker 3 and speaker 4 were wrong; but not speaker 1 and speaker 2.]*

       b.   #Ann and Bea claimed that every speaker was wrong.

Therefore, given the same cumulative scenario in each example, the target sentence in (8b) is felicitous while the target sentence in (9b) is degraded: cumulation shows the same

predicate sensitivity as variation readings. I propose that this contrast is not specific to *claim* and *make sure* but representative of a more general phenomenon where an embedding predicate either licenses both variation readings and cumulation, or it licenses neither. This hypothesis leads to the following prediction: cumulation should show higher acceptability ratings with *make sure*-like predicates than *claim*-like predicates. We tested this prediction through another acceptability rating task where 22 participants were shown cumulative scenarios, like (8) and (9), with target sentences containing plural subjects (e.g., conjoined proper nouns). Controls involved non-conjoined subjects that simply referred to a single individual ('non-conjoined subject' in Figure 2). The results are shown in Figure 2.
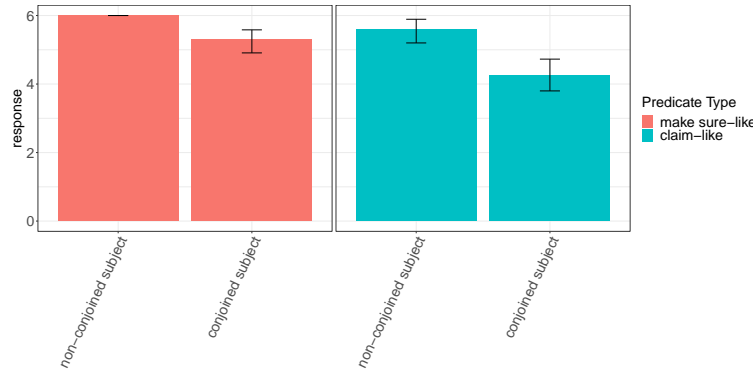

Figure 2: Acceptability ratings for cumulation.

The main observation in Figure 2 is that cumulation with conjoined subjects is rated higher with *make sure*-like predicates compared to *claim*-like predicates. This provides evidence for the hypothesis that cumulation with plural subjects and variation readings show the same predicate sensitivity. The results were analyzed using linear mixed effects models with predicate type and context (non-conjoined vs. conjoined) as fixed effects (including interactions) and random intercept and slopes by item (including interactions). Significance wasn't quite achieved for the interaction term between predicate type and context ($p = 0.066$), but a clear effect was nevertheless present.[4] These results support the empirical generalization in (10):

(10)   *The cumulation-variation correspondence*
         A clause embedding predicate licenses variation readings (i.e. apparent wide scope
         of a universal) whenever the predicate licenses cumulation with plural subjects.

One way to make sense of these experimental results is if tensed complement clauses do impose locality constraints on QR after all, and apparent wide scope is an illusion, derived via cumulation. As a result, the predicate-dependence of variation readings is simply a consequence of cumulation also being predicate-dependent. The upshot of tying these phenomena together is that we have a way of analyzing examples involving conjoined sub-

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[4]We have since run a bigger experiment where the relevant interaction term did come out significant.

jects (the cumulation cases): inferential analyses of cumulativity put forth in Kratzer 2002 and Harada 2022—henceforth, 'the cumulative inference analysis'.

4.   Cumulative inferences and variation readings

In Section 4.1, I present the cumulative inference analysis of cumulation with plural subjects. After that, in Section 4.2, I outline how the cumulative inference analysis can be extended to handle variation readings as well.

4.1   The cumulative inference analysis

Drawing on inferential analyses of cumulativity (Kratzer 2002, Harada 2022), I analyze cumulativity across a tensed clause boundary using cumulative inferences. The main idea underlying the analysis builds on the claim put forth in Krifka 1992 and Kratzer 2002 in which certain relations between individuals and events can be cumulated, as in (11).

(11)   *Cumulative inference:* $\forall e \forall e' \forall x \forall y [[R(x)(e) \wedge R(y)(e')] \rightarrow R(x+y)(e+e')]$

In what follows, I assume that embedding predicates like *make sure* are relations between individuals, events and propositions, as in (12).

(12) $[\![\text{make sure}]\!] = \lambda p_{\langle s,t \rangle} \lambda x_e \lambda e_v.$ make-sure(x)(p)(e)

The claim I am making is that predicates like *make sure* have the same cumulating property as outlined in (11) due to their lexical semantics, and this gives rise to weak truth conditions.[5],[6] This means that, following (11), separate making sure events can be cumulated into a plurality of events. Analogously, the relevant individual from each of these events is also cumulated together into a plurality of individuals and the propositional arguments of *make sure* also get conjoined. This is shown in (13), which illustrates the relevant inferential property as it applies to *make sure*.

(13) $\forall e \forall e' \forall x \forall y \forall p \forall q [[\text{make-sure}(x)(p)(e) \wedge \text{make-sure}(y)(q)(e')]$
        $\rightarrow \text{make-sure}(x+y)(p \wedge q)(e+e')]$

With these assumptions in place, we can return to the above example, repeated in (14). The intended interpretation is captured as a result of the inferential property of *make sure* pro-

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[5]In some sense, the claim I am making is a generalization of (11) since the propositional arguments of the embedding predicate also get conjoined, along with the event and subject arguments.

[6]Which properties of their lexical semantics enable this is a question which I leave for future research. This claim about embedding predicates is somewhat akin to imposing a meaning postulate on the predicate. However, I am reluctant to call this a meaning postulate because there are reasons to believe that it is not entirely a matter of lexical semantics but also influenced by pragmatics/context. Unfortunately, due to space, I cannot address these concerns here.

vided in (13) (in contrast, a predicate like *claim* doesn't have these inferential properties). The intended interpretation of (14b), given the context in (14a), is provided in (14c).

(14)   a.   *[Ann made sure that speaker 1 and speaker 2 had a ride; but not speaker 3 and speaker 4. Bea made sure that speaker 3 and speaker 4 had a ride; but not speaker 1 and speaker 2.]*

       b.   Ann and Bea made sure that every speaker had a ride.

       c. $[\![(14b)]\!] = 1$ if $\exists e[\text{make-sure}(a{+}b)(\forall x[\text{speaker}(x) \to [\text{ride}(x)]])(e)]$
          'There exists a making sure event e in which Ann and Bea are the subjects and for each speaker x, x has a ride.'

The first step towards deriving this interpretation involves the cumulative inference in (15).

(15) $\text{make-sure}(a)(\text{ride}(s_1{\wedge}s_2))(e_1) \wedge \text{make-sure}(b)(\text{ride}(s_3{\wedge}s_4))(e_2)$
      $\to \text{make-sure}(a{+}b)(\text{ride}(s_1{\wedge}s_2{\wedge}s_3{\wedge}s_4))(e_1{+}e_2)$

In (15), the first conjunct corresponds to Ann's contribution (e_1) and the second conjunct to Bea's contribution (e_2). Cumulation combines e_1 and e_2 into the plurality $e_1{+}e_2$, now involving the plural subject, a+b. Assuming there are only four speakers, the conjunction of speakers 1 and 2 having a ride and speakers 3 and 4 having a ride is contextually equivalent to every speaker having a ride, (16)—what I refer to as a 'universal inference'.

(16) $[\text{ride}(s_1{\wedge}s_2) \wedge \text{ride}(s_3{\wedge}s_4)] \to \forall x[\text{speaker}(x) \to [\text{ride}(x)]]$

Combining these two contributions amounts to an event ($e_1{+}e_2$) where Ann and Bea, between them, made sure that every speaker had a ride—which is the desired interpretation. In the next subsection, I argue that variation readings can also be analyzed as involving this kind of cumulation (i.e., cumulative inferences), though there are challenges that arise.

4.2   Locating the plurality

In this section, I begin by outlining the challenges that arise when analyzing variation readings as a form of cumulation in disguise. I will then attempt to sketch one possible way of making sense of these challenges by identifying the ingredients one can use to overcome them (though a fully worked out analysis will remain beyond the scope of this paper).

As we saw in Section 4.1, the cumulation we are concerned with involves a plurality in the matrix subject position. If variation readings also involved such a plurality, then they could be analyzed just like the examples in Section 4.1. But since they don't contain overtly plural subjects, this raises the following question: where does the subject plurality come from with a singular indefinite? This leads to our first challenge.

(17)   **Challenge 1:** singular indefinites don't supply the plural subject that is needed for cumulation to take place.

To this end, I propose that, contrary to appearances, variation readings actually do involve a hidden plurality in the subject position. However, this alone doesn't resolve the issue. Assuming we can derive a plurality in the matrix subject position, this would suggest that the singular indefinite is really interpreted like a plural indefinite. As a result, the meaning of (3), repeated in (18a), would be equivalent to (18b), where the singular indefinite, *a student*, is replaced by the plural indefinite, *students*.

(18)   a.   A student made sure that every speaker had a ride.
        b.   Students made sure that every speaker had a ride.

Could it be that grammar is simply confused about plural morphology in this case and the singular indefinite really is just interpreted as if it were plural? This would be a strange state of affairs indeed, and thankfully, it appears that the answer in this case is no. To see why, observe that the two sentences in (18) are true in different scenarios and therefore have different meanings. To illustrate, consider (19).[7]

(19)   a.   *[There are three invited speakers. To get from the airport to campus, one has to take a shuttle bus, then get a ride. Student 1 made sure every speaker had a shuttle ticket and student 2 made sure every speaker had a ride to campus.]*

        b.   Students made sure that every invited speaker got to campus.

        c.   #A student made sure that every invited speaker got to campus.

In (19a), the conjunction of the two propositions, *every speaker had a shuttle ticket* and *every speaker had a ride to campus*, is contextually equivalent to the proposition that *every speaker got to campus*. This means that, in (19a), the two students, between them, made sure that every speaker got to campus. As a result, the sentence with a plural indefinite subject, (19b), is felicitous and true in this context. If the singular indefinite subject is simply interpreted as a plural indefinite, we would expect (19c) to also be felicitous and true in this context, contrary to what is observed.[8] This contrast in (19) shows us that cumulation with singular indefinites is more restricted than cumulation with plural indefinites. Intuitively, the problem with (19c) in this context is that it took two students to get each speaker to campus, not one, and this conflicts with the use of the singular indefinite. This tension doesn't arise with plural indefinites.

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[7]I am indebted to Danny Fox for bringing cases like this to my attention.

[8]It should be noted that this issue would be avoided under a QR approach. QR would result in the following paraphrase: for each speaker x, a student made sure that x got to campus. These truth conditions are not satisfied in the above context. Does this mean that one should revert back to a QR approach? I argue that the answer is still no. This is because the above challenge can also be reproduced with negative indefinites, not just universal quantifiers. In the same context, a sentence like *a student made sure that no speaker was late to campus* is still infelicitous. However, in this case, QR is of no help. This suggests that a refinement of the cumulation story that overcomes this challenge would be more general, as it would account for cases involving universal quantifiers and negative indefinites, unlike QR.

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This means that, not only do we need to somehow retrieve a plurality from a singular indefinite for cumulation to take place, but this derived plurality leads to a different meaning than sentences with plural indefinite subjects. [9]

(20)   **Challenge 2:** simply substituting a plural indefinite for a singular indefinite leads to a weaker meaning for the sentence as a whole.

Therefore, our goal is to derive a plural subject in a way that also suitably restricts the meaning of the sentence. The general idea will be that, due to the use of the singular indefinite, the plurality gets constructed in a way that strengthens the sentence by imposing further requirements on its meaning. So the difference in meaning is due to the way the plurality comes about. More specifically, in cases of cumulation with plural indefinites, the embedded quantifier is in a sense inert. Schematically, cumulation takes the form: *X made sure that p*, where *p* is an unanalyzed proposition that is brought about by members of the plurality, *X*. In contrast, the embedded quantifier plays an important role in the path to constructing a plurality through a singular indefinite subject. In these cases, I propose that the embedded quantifier supplies a set of events which enable the construction of a plurality in the subject position. Now, in the remainder of this section, I will attempt to spell out this proposal in a little more detail, and sketch how this works to capture variation readings as cases of cumulation.

To start, consider (18a). From the embedded proposition, we can retrieve a set of 'caused events': for each speaker x, there is an event where x gets a ride. Crucially, it is the quantifier that signals this presence of a set of events. Now, each of these caused events results from a corresponding 'causing event', i.e., a making sure event. This means we can also retrieve a plurality of causing/making sure events. Finally, each making sure event has an agent (in this case, a student) and the singular indefinite picks out the agent of each event. It is in this sense that the use of the singular indefinite restricts the kind of cumulation that is involved: by imposing the requirement that each singular making sure event involves a unique agent (i.e., a unique student). This has the effect that each caused event was brought about by a single agent. To capture this intuition, I propose to analyze the singular indefinite as a choice function parameterized to an event: it takes an event and a set of individuals as input and returns an individual from this set, as illustrated in (21).

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[9]Another example illustrating the difference between plural indefinite and singular indefinite subjects is provided in (i), where the universal quantifier is replaced with a singular definite (Harada 2022:Ch.2).

(i)   a.   *[The ramen recipe is comprised of two parts: the noodle recipe and the broth recipe. Chef 1 proved that the noodle recipe is flawless. Chef 2 proved that the broth recipe is flawless.]*

   b.   Two chefs proved that the ramen recipe is flawless.
   c.   #A chef proved that the ramen recipe is flawless.

In (i), even though the embedded proposition contains a singular definite, *the ramen recipe*, the context establishes that this recipe is divided into two parts. As a result, cumulation is possible with the sentence containing a plural indefinite subject while the sentence with a singular indefinite subject is not felicitous in the provided context.

(21)   a. $[\![a]\!] = \lambda P \lambda e.\ f(P)(e) \in P\ \&\ f(P)(e)$ is the agent of e
       b. $[\![a\ student]\!] = \lambda e.\ f([\![student]\!])(e)$ is a student & the agent of e

In (21), the singular indefinite outputs the unique agent for a given event. A plurality can then be retrieved by allowing some flexibility concerning the inputs/outputs of this function; for example, by being able to access the image of the function. More specifically, this can be achieved by allowing the function to not only take as input a singular event (to return a singular individual), but lifting the function so that it can also take as input a plural event (to return a plural individual—the set of agents of the plural event), as shown in (22).

(22) $[f(P)(e) = a \wedge f(P)(e') = b] \rightarrow f(P)(e+e') = a+b$

In (22), a is the agent of the event e and b is the agent of event e', so we can apply the function to the plural event e+e' and retrieve the plural individual a+b. Crucially, this flexibility concerning the inputs of the function (and the ability to access the image of the function) is due to the inferential properties of the predicate—it is not freely available.[10] For concreteness, let me sketch how these ingredients capture the variation reading in (23).

(23)   a.   *[There are three speakers. Student 1 made sure speaker 1 had a ride; student 2 made sure speaker 2 had a ride; student 3 made sure speaker 3 had ride.]*

       b.   A student made sure that every invited speaker had a ride.

The embedded proposition identifies three caused events, one corresponding to each speaker getting a ride. From those, we retrieve three causing/making sure events; let's call them e_1, e_2 and e_3. Student 1 is the agent of e_1, student 2 the agent of e_2 and student 3 the agent of e_3. Since *make sure* allows for cumulation, we can apply the choice function to the plural event $e_1+e_2+e_3$ and retrieve the plural individual comprised of the three agents: $student_1+student_2+student_3$. The resulting interpretation can then be paraphrased as: $student_1$, $student_2$ and $student_3$, between them, made sure that every speaker had a ride. Importantly though, due to the way the plurality was constructed, the sentence as a whole still carries the requirement that each student in the resulting plurality is the agent of a singular making sure event, which, in turn, lead to an event of a speaker getting a ride.

What does this added requirement buy us? Well, this way of constructing a plurality out of a singular indefinite explains why (19c) is perceived as infelicitous. In (19a), even though there is a unique agent for both making sure events, neither of these events on

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[10]The fact that we can access the image of the function to derive a plurality is supported by the observation that the same predicates which license variation readings also license impersonal readings. For example, (ia) is compatible with the provided cumulative scenario, while (ib) is not.

(i)   *[There are three speakers. Student 1 made sure/claimed speaker 1 had a ride; student 2 made sure/claimed speaker 2 had a ride; student 3 made sure/claimed speaker 3 had ride.]*

       a.   It was made sure that every speaker had a ride.
       b.   #It was claimed that every speaker had a ride.

their own leads to an event of a speaker getting to campus. It is not sufficient to retrieve a plurality of individuals from any set of causing events. Rather, each relevant causing event (on it's own) must lead to an event where a speaker gets to campus.

Before moving on, I would also like to point out that variation readings with negative quantifiers are in fact expected under this cumulative inference analysis. This is because it doesn't matter if the embedded proposition contains a universal quantifier or a negative indefinite, as long as the embedded quantifier provides a set of caused events through which a plural subject can be constructed. I propose that both quantifiers can do this.

To take stock, I propose a plurality can be constructed in the subject position as follows.

1. a set of caused events is retrieved from the embedded proposition (this set of events is supplied by the quantifier).

2. look at the corresponding set of causing events, and the singular indefinite (analyzed as a choice function) picks out the agent of each of these events.

3. a plurality is retrieved by lifting the choice function and applying it to the plurality of causing events, which returns a plurality of agents.

Furthermore, the restricted cumulation that is observed with a singular indefinite subject (as opposed to a plural indefinite) is due to the way the plurality is constructed. Not only do we retrieve a plurality, but we do so in the very specific way outlined above. As a result, each of the individuals in the derived plurality must be the agent of a making sure event which leads to an event that is supplied by the embedded proposition.

5. Concluding remarks

The takehome message that I have argued for is that apparent inverse scope out of a tensed clause is not due to an exceptional scope shifting mechanism, like QR, but the indirect result of a cumulative inference. We reached this conclusion in two steps. First, in Section 2, I argued that non-local QR is not general enough to account for variation readings due to the observation that these readings are also available with negative indefinites. Second, we observed in Section 3 that variation readings and cumulation with plural subjects are correlated insofar as they exhibit the same predicate sensitivity, suggesting that the same underlying mechanism is responsible for both phenomena.

I'd like to make another observation which supports the conclusion that tensed clauses are scope islands for QR. We've been using variation of the indefinite as a means of detecting where the universal takes scope. But as we pointed out in the introduction, this is not necessary. An alternative diagnostic for non-local QR is to assess the relative scope of the universal and the embedding predicate directly, as shown in (1).

To sharpen intuitions, we can use an embedding predicate with existential quantificational force.[11] First, consider (24).

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[11]This is just so that the two operators under consideration, the embedded universal quantifier and the embedding predicate, are not scopally commutative.

(24) *[Scenario: there can only be one winner in the race.]*
      For every runner, I consider it possible that they will win.

The example (24) is felicitous in this scenario. This means that the sentence licenses a reading which conveys that each runner has a chance of winning. Now consider (25), which is similar to (24) but where the universal quantifier is embedded in the tensed clause.

(25) *[Scenario: there can only be one winner in the race.]*
      #I consider it possible that every runner will win.

In principle, there are two possible readings for (25). The first is a surface scope reading, paraphrased as: I consider it possible that all the runners will win. This reading is contextually ruled out by the scenario though. The second reading is the inverse scope reading, paraphrased as: for each runner x, I consider it possible that x will win. This reading is compatible with the scenario and corresponds to the reading in (24). If non-local QR is possible, the inverse scope reading should be available for (25) and so the sentence should be felicitous. This is not what we observe though: the sentence is infelicitous in this scenario, suggesting that the inverse scope reading is not attested. Again, we can make sense of this observation if tensed clauses are scope islands for QR after all.

I end with a puzzle concerning variation readings. One seemingly problematic observation for the conclusion that tensed clauses are scope islands for QR is illustrated in (26).

(26) A different student made sure that every invited speaker had a ride.

(26) licenses an internal reading of the adjective *different*. This reading is usually only assumed to be available when *different* is in the scope of a distributive operator, like *every*. Thus, (26) can be taken as evidence that *every* can QR out of the tensed clause to a position above the subject. Furthermore, (27) illustrates that the same internal reading of *different* is not possible when the sentence contains an embedded negative indefinite.[12]

(27) #A different student volunteer made sure that no tour started late.

The contrast between (26) and (27) is, in some sense, expected if *every* is able to QR out of the tensed clause but *no* cannot. However, my judgment is that, in contrast to *different*, an internal reading of *same* is possible with an embedded negative indefinite, (28).

(28) The same student made sure that no tour started late.

Like internal readings of *different*, internal readings of *same* are assumed to be possible whenever *same* is in the scope of a distributive operator (or, more generally, a semantic plurality). Therefore, it seems like embedded universal quantifiers and embedded negative indefinites can both license internal readings of adjectives.

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[12]I am indebted to Amir Anvari for pointing out the contrast between (26) and (27) to me.

Finally, note that other diagnostics for wide scope universals suggest a different conclusion. For example, pair-list responses to questions are normally licensed when the *wh*-word is in the scope of a distributive quantifier, like *every* or *each*. This is illustrated in (29).

(29)   Which student picked up every/each speaker?
    a.   Mary did.   which $>\forall$
    b.   Mary picked up speaker 1; Bill, speaker 2; John, speaker 3. $\forall >$which

Now consider the corresponding sentences with a tensed complement clause, as in (30).

(30)   Which student made sure that every/each invited speaker had a ride?
    a.   Mary did.   which $>\forall$
    b.   #Mary made sure that speaker 1 had a ride; Bill made sure that speaker 2 had a ride; John made sure that speaker 3 had a ride. $\forall >$which

In this case, a pair-list response is unavailable, suggesting that the universal quantifier cannot QR out of the tensed clause and above *which student*.

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