

Star Operators Episode 2: Return of the Double Star

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There is an interesting, well-documented parallel between universal quantifiers such as ‘every’ and pluralities such as ‘the Padawans’ when used in questions (e.g. Engdahl 1980, May 1985), namely that both can give rise to pair-list readings (PLRs) (other readings are available, but not relevant for the matter at hand).

- (1) a. Q: Who did the Padawans fight? A: ‘Luke fought Vader. Rey fought Kylo.’
- b. Q: Who did every Padawan fight? A: ‘Luke fought Vader. Rey fought Kylo.’

We present new data showing that these readings are sensitive to intervention effects (cf. Beck 2006) and propose a unified approach covering ‘every’ and pluralities that also addresses empirical inadequacies in the literature. This approach provides further insight into the nature of and relation between quantification and pluralities.

Current state of the art: Previous approaches to PLRs assume, often implicitly, movement across the question operator Q (e.g. Beck 1996, Szabolcsi 1997, Pesetsky 2000), interpreting (1-b) along the lines of (2). We call this the ‘*raising approach*’.

- (2) For each Padawan x, I ask: who did x fight?

This allows for a pair-list answer, and also explains Beck’s (1996) observation that ‘every’ does not cause intervention effects when used as part of an n-tuple-list reading. We have two reasons for rejecting the raising approach:

Firstly, the assumption that distribution happens above Q overgenerates by predicting the availability of PLRs in questions containing singular which-phrases. (3) shows that this prediction is not borne out, as the PLR is only available with the plural which-phrase in (3-b). This is not an inherent property of singular which-phrases, as seen in (3-c).

- (3) a. **Which candidate** did the senators vote for? (pair-list unavailable)
- b. **Which candidates** did the senators vote for? (pair-list available)
- c. Every senator knows **which candidate** he will vote for.

Secondly, as seen in (4), pluralities in questions are themselves sensitive to intervention effects. This is surprising, as pluralities are not usually seen as sensitive to intervention. This poses a challenge to the raising approach, which assumes all relevant elements to be situated above the critical intervener ‘only’, offering no explanation for the intervention effect observed in (4-b).

- (4) a. Q: What did Yoda feed the students?
 A: Yoda fed Luke worms and Yoda fed Leia grub.
- b. Q: What did only Yoda feed the students?
 #A: Only Yoda fed Luke worms and only Yoda fed Leia grub.

Our Approach: We distance ourselves from the raising approach, and do not assume an interaction between the speech act operator and a distributing element. Instead, we make the following two assumptions:

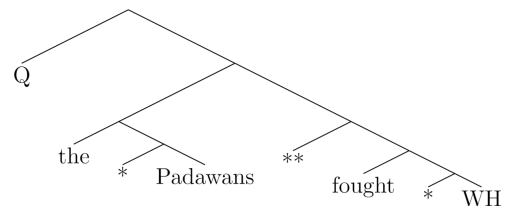
1. Plural wh-phrases carry Link’s (1983) *-operator (5-a).
2. A predicate modified by ** ((5-b), from Krifka 1986, Beck 2000 a.o.) can only create a cumulative reading if at least two of its arguments denote plural entities (‘*Rule of Two*’).

- (5) a. $* = \lambda P_{et}.\lambda x_e.P(x) \vee \exists x_1, x_2 \in D_e \text{ s.t. } x = x_1 \oplus x_2 \ \& \ [^*P](x_1) = [^*P](x_2) = 1$
 b. $** = \lambda P_{et}.\lambda x_e.\lambda y_e.P(x)(y)=1 \vee \exists x=x_1+x_2, y=y_1+y_2 [^{**}P](x_1)(y_1)=[^{**}P](x_2)(y_2)=1$

If a $**$ -predicate does not have access to two plural arguments, for example due to movement, we find ourselves in a configuration analogous to Chomsky’s (1993) reconstruction configurations, exemplified in (6). We propose that the solution to the problem is the same: To avoid a violation of the Rule of Two, the wh-phrase is reconstructed at LF.

- (6) a. [Which picture of himself₁] did Han₁ like [~~which picture of himself₁~~]
 b. \Rightarrow Han₁ like [which picture of himself₁]
 (7) a. [* Who] did [* the Padawans] [** fight [~~* who~~]]
 b. \Rightarrow [* the Padawans] [** fought [* who]]

While the raising approach can be paraphrased as in (8-a.), our approach would result in a paraphrase like (8-b.). The respective answers are in (9).



- (8) a. For each Padawan x, I ask who x fought.
 b. What is the Plural entity Z, such that the Padawans cumulatively fought Z?
 (9) Context: Luke fought Vader, Rey fought Kylo
 a. Answer under raising approach: ‘For Luke: Luke fought Vader; for Rey: Rey fought Kylo.’
 b. Answer for $**$ approach: ‘Luke \oplus Rey ** fought Vader \oplus Kylo’
 Cumulative reading: ‘Luke fought Vader, Rey fought Kylo.’

Cumulative interpretation of (9-b) derives the reading that each of the Padawans fought at least one of Vader \oplus Kylo, and that each of Vader \oplus Kylo was fought by at least one of the Padawans. This directly corresponds to a PLR, e.g. ‘Luke fought Vader and Rey fought Kylo.’ The PLR of (1-a) is correctly derived under both approaches. However, unlike raising, our approach correctly predicts that **a pair list-reading in a ‘which’ question is only attainable for which-phrases containing plural morphology**. Reconstruction of the which phrase to avoid violation of the Rule of Two is only an option if the which-phrase itself is plural. Thus, (10-a) is correctly predicted to lack the PLR that (10-b) has, entirely analogous to the corresponding declaratives.

- (10) a. Which Sith lord did the Padawans fight?/The Padawans fought the Sith lord.
 b. Which Sith lords did the Padawans fight?/The Padawans fought the Sith lords.

(10-b.) allows for a cumulative reading in which different Padawans fought different Sith lords. In both questions and declaratives, plural morphology on the object NP is required for this reading. This matches the prediction of our approach, but not that of the raising approach. We also correctly predict that the **PLR is sensitive to intervention effects** by focus sensitive operators such as ‘only’. Reconstructing the wh-phrase at LF means that the question operator Q is not directly adjacent to the source of alternatives, but has to evaluate alternatives that have percolated up the tree. This process is known to be sensitive to intervention (e.g. Beck 2006). A PLR is available in (4-a), but not (4-b). The raising account incorrectly predicts (4-b) to have a PLR, since raising ‘the students’ would mean that ‘only’ is no longer in an intervening position between the relevant elements Q, wh-phrase and plural.

What about ‘every’? ‘every’ also causes intervention effects in multiple questions, except when interpreted as part of a triple-list reading, such as the one in (11).

(11) Who did everyone see where? $\hat{=}$ ‘For all persons x: who did x see where?’

This has been interpreted as evidence for a movement of ‘every’ across the speech act operator, raising it out of the intervening position. Instead, we rely on the fact that ‘every x’ can also be interpreted as a plural entity as in (12).

(12) Everyone gathered in the hallway.

Here, ‘everyone’ denotes a plurality, as evidenced by the strictly collective predicate ‘gather in the hallway’. Following the AltSemCycle (Beck 2017), ‘every’ is currently on the way to becoming a plural term. Thus, ‘every x’ can be read as a quantifier, causing intervention effects, or a (scopeless) plural entity.

Overall, our approach provides more complete empirical coverage than the raising approach without stipulating additional machinery.

Selected References: **Beck, S. 2006.** “Intervention Effects Follow from Focus Interpretation.” *Natural Language Semantics*, 14: 1–56. **Beck, S. (2000).** “Star Operators – Episode 1: Defense of the Double Star.” *UMOP* 23, 1–23. **Link, G. (1983).** “The Logical Analysis of Plurals and Mass Terms: A Lattice-theoretical Approach.” In: *Formal Semantics - The Essential Readings*. **Szabolcsi, A. (1997)** “Quantifiers in pair-list readings.” In: *Ways of Scope Taking.*, Springer