

**Variation in the logic of durativity of ‘until’-like particles:
A contrastive analysis of English and Spanish**
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Overview.- The inability of durative adverbials, like English *until* or Spanish *hasta*, to modify telic predicates is well-known. See the contrast in acceptability in (1) where both *until/hasta* cannot modify a punctual verb with a singular indefinite theme, yet they become fine with a bare-plural.

- (1) a. # *Una persona* *llegó hasta las dos.*
a person arrived until the two
‘#A person arrived **until** two.’ \approx a person kept arriving until 2 (**odd**)
- b. *Personas* *llegaron hasta las dos.*
people arrived until the two
‘People arrived **until** two.’ \approx different people arrived over the course of an interval

When taking a closer look at these two cross-linguistic related forms, we find an unexpected contrast: English *until* is still unacceptable when a non-iterative punctual verb takes a plural quantified theme, but in Spanish the sentence is perfectly fine and receives a cumulative reading, as in (2b).

- (2) a. #30/ many/ some people arrived until 2 pm.
→ Distributive reading: every member of the group kept arriving until 2 (**odd**).
- b. ✓30/ muchas/ algunas personas llegaron hasta las dos.
→ Cumulative reading: a total of 30/many/some people arrived non-simultaneously over the course of an interval that ended at 2 pm (**OK reading**).

Two major traditional approaches have been proposed for English: (i) Dowty’s line (cf. 3a), which treats measure phrases as universals (where the verbal predicate must hold of its subintervals), and (ii) Krifka’s line, which translates them as existential adverbials of temporal framing with a divisiveness/pluractionality selectional requirement (cf. 3b). (In what follows, t_0 is a contextually supplied left boundary; $[t_0, x]$, a closed time interval; and $\tau(e)$, the duration of the event e)

- (3) a. Dowty’s approach: $\llbracket \text{Until } x\text{-time} \rrbracket = \lambda P. \lambda t[\llbracket t_0, x \rrbracket(t) \wedge \forall t' \subseteq t \rightarrow P(t')]$
- b. Krifka’s approach: $\llbracket \text{Until } x\text{-time} \rrbracket = \lambda P. \lambda e : \text{atelic}(P). P(e) \wedge \tau(e) = [t_0, x]$

Goal.- The question that arises is how to accommodate the English vs. Spanish difference within either of these approaches. **What kind of parameter is responsible for this variation, and which of the available theories is better equipped to explain it?** A version of the universal quantification approach appears to be more advantageous for English *until*, since the universal component is intrinsic to the meaning of the durative adverbial and naturally accounts for the durative requirement, without having to stipulate any theory of atelicity in the presuppositional content. It can also derive an scopal account that captures the acceptability of telic predicates under negation. But it is not obvious how to extend such an approach to incorporate the additional atelic meanings of *hasta*. I claim instead that a revised version of the existential analysis captures the essence of *hasta*.

My proposal for *hasta* (vs. *until*).- To start, we revise the condition of atelicity that Krifka imposes on *until*-XPs on the basis of a theory of plurality developed by Spector (2007). Spanish *hasta* is an existential temporal framing adverbial subject to a plurality condition, which is responsible for its durative behavior. Following Spector’s treatment of plurals, plurality is not directly

encoded into its meaning. The reason for this is that the semantic contribution of plural morphology in DPs does not behave like an entailment or a presupposition, as it disappears under negation. For instance, note that an ‘at-least-2’ reading is implicated in *the homework contains difficult problems* vs. an ‘at-least-1’ reading in *the homework doesn’t contain difficult problems* (Spector 2007). Something similar to the disappearance of plural meaning takes place with durative-XPs under negation, which is why punctual events become acceptable in such a context: *John didn’t arrive until 2*. In light of the above, *hasta*-XPs simply place the eventuality within an interval and assert that there are events e (one or more) whose durations fall e.g. between t_0 and 2 pm.

$$(4) \llbracket \text{hasta las dos} \rrbracket = \lambda P_{\langle ev, t \rangle} . \lambda e [P(e) \wedge \tau(e) \text{ falls between } t_0 \text{ and } 2pm]$$

At the same time, *hasta* also activates singular alternatives of the following form:

$$(5) \text{Alternative}_{singular} = \lambda P_{\langle ev, t \rangle} . \lambda e [P(e) \wedge \tau(e) \text{ falls between } t_0 \text{ and } 2pm \wedge \forall e' [e' \leq e \wedge \tau(e') \text{ falls between } t_0 \text{ and } 2pm \rightarrow e' = e]]$$

The activation of singular alternatives induces a process of exhaustification in a way familiar to the theory of scalar implicatures by negating any stronger, non-entailed, relevant alternatives (Chierchia 2013). The alternative in (5), which claims a unique singular event e within the interval in question, is stronger than the assertion in (4), as (5) entails (4). After negating the alternative, the **plural implicature** that winds up being added to the meaning of *hasta* is the following: **A) There has to be more than one event of the relevant type OR B) the event must have proper parts.**

Under my proposal, e.g. (1a) asserts that there was one or more arrivals of the same person between t_0 and 2, and implicates not just one, which explains its deviance, as it describes a nearly impossible situation with a telic predicate (but not with an atelic predicate). This proposed analysis will also be able to predict the ability of *hasta*, unlike English *until*, to modify a telic predicate that takes a plural quantified DP, since it opens the possibility of a cumulative interpretation:

- (6) a. **30 personas** llegaron hasta las dos (‘#30 people arrived until 2’)
 b. Implicature: **A)** There were multiple arrivals of 30 people (**odd**) or **B)** the 30-people arrival event has subparts that are not identical to the 30-people arrival event but a proper part of it: arrival of person#1, of person#2, [...], of person#30. (✓ **OK**)

An important further consequence of the present approach is the acceptability of *hasta* with the presence of negation despite the type of predicate used. The plural implicature disappears due to the reversal of entailment patterns. Hence, no pragmatically deviant situation may arise. This is also advantageous over a presuppositionally-based atelic condition *à la* Krifka which needs to resort to a fusion-based treatment of negation so that the adverbial can pick an atelic ‘negative event.’

Conclusions.- By comparing two closely related functions we still find significant variation in their behavior to the point that a unified analysis of durative *until* and *hasta* is not liable. My proposal is that while *until* is indeed a universal quantifier as proposed by Dowty, Spanish *hasta* is a plural existential quantifier, where plurality is to be couched as an implicature. The plurality requirement on *hasta*-phrases accounts for the impossibility for *hasta* to combine with punctual, non-iterative eventualities and it has two further important consequences: (i) cumulative readings become available (thereby accounting for the contrast in (2)) and (ii) the plural implicature disappears under negation, explaining why punctual events are grammatical in such contexts. This predicts *at least* two major cross-linguistic patterns in the nature of durativity of *until*-XPs.

Further Implications.- A potential subclassification in this twofold proposed system is that there could be languages that have an existentially-based *until* that lexicalizes differently under negation (since NPIs are usually existential in nature, Chierchia 2006). In principle such languages should not block cumulative readings. Greek seems to be such a language that has an NPI-variant of its *until* counterpart (Condoravdi 2008) and the aforementioned prediction is indeed borne out.