

Comments on:
Altshuler, Daniel, *A typology of partitive aspectual operators*
Ana Arregui

Even though the study of aspect has a long history in a wide variety of traditions within linguistics, it is still rare to find proposals that take on the puzzle of accounting for data cross-linguistically. Altshuler’s article provides a welcome investigation into the typology of aspectual operators within a formal semantics framework. The main empirical focus is on two aspectual markers: Russian –yva (traditionally characterized as an imperfective marker: ^{RUSS}IPF) and Hindi –kaa (one of the markers traditionally characterized as a perfective: ^{SVP}PFV). Even though both aspectual markers allow for the possibility that events have reached completion, this is not entailed: both markers are compatible with the explicit denial of event-completion. Interestingly, the aspectual markers differ as to whether events can be understood as ‘in progress’, highlighting a difference between events having reached completion vs. events having stopped.

Altshuler’s proposal for both operators is to adopt a ‘partitive’ analysis that appeals to the stages of an event. The proposal builds on the analysis of the English progressive (PROG) in Landman (1992) and is parametrized in various ways in order to account for cross-linguistic variation. This gives rise to a typology of partitive operators that Altshuler tentatively extends to the French imparfait (^{FRENCH}IPF), speculating with respect to other potential aspectual operators.

In adapting Landman’s analysis, Altshuler takes on some of the core commitments in Landman’s proposal, such as the concept of event stages that ‘develop’ into other events and the appeal to worlds that are ‘reasonable options.’¹ Altshuler characterizes the interpretation of English PROG as in (1):

- (1) $\text{PROG} \Rightarrow \lambda P \lambda e' \exists e \exists w [\text{STAGE}(e', e, w^*, w, P)]$
 $[[\text{STAGE}(e', e, w^*, w, P)]]^{M, g} = 1$ iff (i)-(iv) holds:
 (i) the history of $g(w)$ is the same as the history of $g(w^*)$ up to an including $\tau(g(e'))$
 (ii) $g(w)$ is a reasonable option for $g(e')$ in $g(w^*)$
 (iii) $[[P]]^{M, g}(e, w) = 1$
 (iv) $g(e') \subset g(e)$ [Altshuler page 17]²

According to (1), PROG maps (VP-predicates) properties of events to properties of stages of those events. The output to PROG holds of an event e' if it is a stage of a VP-event e in a possible world that is a reasonable option and shares the history of the actual world (w^*) up to that time. In Altshuler’s words: “STAGE (e', e, w^*, w, P) is true iff (i) the history of the world denoted by w is the same as actual world up to and including the run time of the event denoted by e' , (ii) the world denoted by w is a reasonable option for the event denoted by e' , (iii) e has the property P in w , and (iv) the event denoted by e' is a part of the event denoted by e .”

Parametrized variations on the proposal in (1) allow for the development of a typology of partitive aspectual operators that share a core semantics but allow for differences

¹ See Portner (1998) for an alternative.

² I use \subset for the proper ‘part of’ /stage relation (\subseteq for improper parts). Altshuler describes \subset as the ‘part of’ relation but in the text also talks about stages. Stages seem to be the most intuitive interpretation.

(e.g. with respect to the part-of relation, singular vs. plural events, and the maximality of event stages). A summary is provided below (Altshuler page 29):

(2) Partitive Operator	Only proper stages?	Only singular events?	Only MAX stages?
^{SV} PFV	No	Yes	Yes
^{RUSS} IPF	No	No	No
PROG	Yes	Yes	No
^{French} IPF	Yes	No	No
???	Yes	Yes	Yes
???	No	No	Yes
???	No	Yes	No
???	Yes	No	Yes

Partitive aspectual operators can differ with respect to whether the STAGE relation in (1) requires e' to be a proper part (\subset) of e (English PROG, ^{French}IPF), or whether improper parts (\subseteq) are allowed (^{SV}PFV and ^{RUSS}IPV). The possibility of predicating over event stages (e') that are equal to VP events (e) explains why both the Hindi and Russian operators give rise to properties that can be true of completed events (e.g. culminating accomplishments), whereas English PROG cannot. Partitive operators can also differ in terms of whether the output property is restricted to singular events or whether it can also be true of plural events. Following Ferreira (2005), Altshuler considers reference to plural events as necessary for a habitual reading of the aspectual operator. Only aspectual operators that allow predication over plural events can be interpreted as habitual (e.g. French and Russian IPF, but not English PROG or Hindi ^{SV}PFV). Finally, partitive operators can also differ in terms of whether the output property is true only of maximal (MAX) stages or not (more on this below).

One very interesting aspect of Altshuler's proposal is that it provides us with a framework in which to compare aspectual notions across languages. This is particularly valuable given the wide range of traditions that deal with aspect and the variety of ways in which terminology is used. Altshuler provides us with a semantic characterization of what it means to be perfective, imperfective or partitive that is robust enough to be used across languages and at the same time has built-in the flexibility needed to accommodate cross-linguistic distinctions. The proposal is moreover precise enough to pinpoint possible locus of cross-linguistic variation and make predictions regarding the range of aspectual meanings we may expect to find in language. While it may be possible to agree or disagree regarding aspects of Altshuler's proposal, the enterprise is a valuable contribution not only to our understanding of specific aspectual operators but also to the type of methodologies that can lead to novel insights.

One interesting empirical issue that arises from Altshuler's research-program relates to the ontological commitments needed to pull it off. Altshuler appeals to a rich ontology that includes possible worlds, events, matching of events across worlds, event stages, as well as singular and plural events (Altshuler notes that times would also come into the picture, but leaves those aside for the moment). Trying to understand aspect across languages can shed useful light on the theoretical primitives needed to understand aspect in language. My discussion below focuses on this type of issue by adding data from Spanish *perfecto* and

Spanish *imperfecto* to the debate. The inclusion of aspectual operators from Romance is interesting since both the perfective and the imperfective behave differently from the perfectives and imperfectives that are the empirical focus of Altshuler's work. Considering a potential analysis of the Spanish operators within Altshuler's framework will provide us with a useful vantage point from which to explore some of the assumptions in Altshuler's work. In what follows I will examine (1) the role of maximal stages, (2) the role of temporal directionality in the interpretation of partitive operators, (3) types of event completion, and (4) the role of modality and plurality in a partitive analysis of perfectives/imperfectives. At the end of the day, refinements appear needed to accommodate new data and unsurprisingly new questions arise as to the commitments needed to account for aspect across languages and the interaction between modal and temporal categories.

1. Maximal Stages

Altshuler points to an interesting difference in the way events can be reported as intuitively unfinished. Both Russian IPF and Hindi ^{SV}PFV can be used to report events that are explicitly marked as incomplete (examples below quoted from Altshuler):

- (3) Russian IPF
- a. Ja dočit- yva-l poslednie stročki pis'ma
I read.up-yva-PST last lines letter
'I (have) read the last lines of the letter.'
- b. ... Xotja ne do-čita-l ix do konca.
Even.though not read.up-PST them until end
'Even though I did not finish it.'
- (4) Hindi ^{SV}PFV
- a. us ne cīTThii paRhii
SV perfective he ERG letter read-PFV
'He read a letter'
- b. par puurii nahii kii
but complete NEG kii
but did not complete it
- (Singh 1998)

However, it is only Russian IPF that can be used to report events that are 'still happening' or ongoing. Hindi ^{SV}PFV does not allow this :

- (5) Russian IPF
- Ja e-l tort, i seičas prodolžaju ego est'.
I eat.IPF-PST.1S cake and now continue it eat.INF
'I was eating cake and now I am still eating it.'
- (6) Hindi ^{SV}PFV
- #maayaa-ne biskuT-ko khaa-yaa aur use ab tak khaa rahii hai
Maya-ERG cookie-ACC eat-PFV and it still eat PROG be.PRS
Intended: 'Maya was eating the cookie, and is still eating it.'

Even though Hindi ^{SV}PFV does not entail the completion of an event, it is not possible to use it to describe events presented as still ‘ongoing’. As Altshuler remarks, there is a difference between the absence of completion associated with Hindi ^{SV}PFV and the ‘progressive’ interpretation made available by Russian IPF. Altshuler’s words: “I would like to distinguish between: an event that culminated and an event that ceased to develop further.” (page 4). Altshuler considers this to be the important difference between perfectives and imperfectives. Both types of operators may appeal to stages of incomplete (non-culminating) events (cached out modally), but what is crucial is that perfectives appeal to stages that have ceased to develop (maximal stages) whereas imperfectives need not (perfectives are the marked option). The notion of Maximal Stage is illustrated with Hindi ^{SV}PFV in (7):³

- (7) ${}^{SV} \text{PFV} \Rightarrow \lambda P \lambda e' \exists e \exists w [\text{MAXSTAGE}(e', e, w^*, w, P)]$
 $[[\text{MAXSTAGE}(e', e, w^*, w, P)]]^{M,g} = 1$ iff (i)-(v) holds:
- (i) the history of $g(w)$ is the same as the history of $g(w^*)$ up to an including $\tau(g(e'))$
 - (ii) $g(w)$ is a reasonable option for $g(e')$ in $g(w^*)$
 - (iii) $[[P]]^{M,g}(e, w) = 1$
 - (iv) $g(e') \subseteq g(e)$
 - (v) $\forall e'' [(g(e') \subset e'' \ \& \ e'' \subseteq g(e)) \rightarrow [[P]]^{M,g}(e'', w^*) = 0$
- [Altshuler page 26]

The maximality constraint on stages ensures that when an activity is reported with a perfective, the output to the aspectual operator will only be true of the ‘biggest’ actual events corresponding to the VP. Thus, if the claim is made with a perfective that John was running in the past, it will not be possible for the running to continue at the speech time. If it did, constraint (v) in (7) would be violated (because there would be some event e'' that would properly include e' such that e'' is a running event in the actual world). The situation is less clear with respect to accomplishments. Suppose that Susan was building a house two months ago and she still is in that process, but the culminating event is not actual. There would be a stage of house-building e' that is a proper part of e'' , which in turn is a proper part of e , an event of Susan building a house. This type of scenario would not violate (v) above, so it would be possible for perfective + VP to be true of a past stage of an event of Susan building a house even if Susan is still building a house. The maximality constraint associated with perfectives in (7) does ensure that when the VP event is (relatively) homogeneous, (past) perfectives report on events that have stopped and are not ‘in progress’. But this is less clear for the case of accomplishments, which lack the subinterval property (such as the Hindi example in (6)). In such cases it does seem that a stage of an event that is found in the past may continue in the present (predicting that examples like (6) should be fine).

Maximality is potentially one way in which the interpretation of partitive aspectual operators could be further parametrized (e.g. we may have a definition that requires that both activities and accomplishments ‘stop’, or one that only targets activities). Distinct ways of characterizing maximality across languages could lead to different flavors of perfectivity.

³ Note for editor: I think there is a typo in Altshuler’s original text for this definition, since it has an existential quantifier instead of a lambda binding e' . This needs to be checked. [please delete this note once this is clarified]

2. Temporal directionality

Altshuler's formulation of a Landman-style analysis for partitive operators identifies the worlds quantified over in terms of match with the history of the actual world up to the relevant event (stage) and reasonableness: in order for the partitive operator claim to be true, there must be some world like the actual world up to the relevant event time (condition (i) in (1)/(7)), which is reasonable (condition (ii) in (1)/(7)), and in which the event is completed (condition (iii) in (1)/(7)). The proposal takes for granted a temporal asymmetry between what has happened before the event (stage) began and what happens afterwards. This can make sense intuitively if we think of classical examples such as *Mary was crossing the street when she was hit by a bus*. The event of the complete crossing is thought of as taking place in a world like the actual world before the accident, and only different from the actual world afterwards. But there are examples that show that when we evaluate sentences with partitive operators, we can consider worlds that differ from the actual world in the past. We will examine this with examples from Spanish imperfect (^{SP}IPF). Imagine that five-years old Alex was drawing with chalk on the sidewalk. She had planned to draw a big big circle, starting on one sidewalk, continuing on to the next, and circling back to the beginning. This takes time. At 5.15pm last Wednesday, Alex was almost back to the beginning of her drawing. Given this state of affairs, we could truthfully claim that at that point in time (8) was true:

- (8) Alex dibujaba un círculo.
Alex drew-IPF a circle
'Alex was drawing a circle'

In discussing this type of examples, we usually focus on the intuition that if she is not interrupted, Alex will reach the beginning of her drawing and naturally stop there, completing the circle. But imagine now that unknown to Alex, her younger sister had snuck up after her and erased big parts of her drawing. It would still be the case that (8) was true. But if in evaluating (8) we only consider worlds that are like the actual world with respect to the past (up to and including the stage at 5.15 pm), we will not find worlds in which Alex simply continues working till she reaches the beginning of the drawing and the circle is completed. To find worlds that include such an event, we would need to consider worlds that differ from the actual world in the past (and Alex's sister does not erase the middle portion of the drawing).

Here is another example illustrating the same point. Imagine that I want to paint my house yellow. I have a big house with four sides. I begin on the side facing the street and work my way around. At 3pm last Tuesday, I was done with three sides and just starting on the last one (I was looking forward to stopping afterwards!). However, unknown to me, my wife has painted the second side I had worked on in a nice blue color. Y's reply to X's question is true in this scenario:

- (9) X: What was Ana doing at 3pm last Tuesday?
Y: Ana pintaba su casa de amarillo.
Ana painted-IPF her house of yellow
'Ana was painting her house yellow'

I will naturally finish painting once I have completed the fourth side. My stopping then cannot be considered an interruption of the painting event. But in order to find a world in which I did paint my house yellow (and completed the VP event), it will be necessary to consider worlds that differ from the actual world at a time before last Tuesday at 3pm.

Examples like these suggest that restricting quantification in the semantics of partitive operators to worlds that exactly match the actual world before the relevant event (stage) may be too strict in some cases. How temporal match plays out may depend on the type of verb. But it may also be the case that the nature of temporal match is an aspect of the interpretation of partitive operators that is subject to parametrization, with some operators allowing early divergence from the actual history while others do not. In the case of Spanish, at least, it seems that early divergence is sometimes possible.

An important intuition in the semantics of the progressive is that completion is ensured by the ‘internal characteristics’ of an event (stage). In Landman’s words: “In determining what chance a stage has of continuing, we abstract away from facts about the world that are external to that stage. Thus we are not interested in the absolute chance that the stage has of continuing, given all the facts about the world, but in its chance of continuing solely on the basis of what is internal, inherent to that stage.” Looking at the Spanish examples above, it seems to be the case that when considering what is possible given the internal, inherent properties of a stage, we are allowed not only to disregard external factors that interfere with its projection into the future, but also external factors that interfere with its projection into the past.

3. On types of completion

There appear to be important differences between Russian IMPFs and imperfectives in Romance. As Altshuler notes, Russian imperfectives allow for completed event interpretations in examples like (10):

- (10) Da, ja otkr-yva-l okno.
Yes, I open-yva-PST window
‘Yes, I {have opened/did open} the window.’ [Altshuler page 2]

The sentence in (10) could be uttered in response to somebody who comes into a cold room in which all the window are closed and asks *Why is it so cold in here?* The corresponding sentence with a Spanish imperfective would not be possible. In such a context, (11) would be completely infelicitous:

- (11) #Abría la ventana.
Opened-IPF the window
Meaning: ‘I have opened/ did open the window’

The sentence would be infelicitous in the context even if it was prefaced with something like *it is really cold because....* One could account for this along the lines proposed by Altshuler for the English progressive by claiming that Spanish IPF receives a partitive operator analysis but only allows proper VP-event stages (indeed, this is the proposal suggested by Altshuler for French imparfait). This would immediately explain the fact that Spanish IPF (and French imparfait) are not possible in this scenario: they can only report on incomplete events.

However, both Spanish imperfect and French imparfait allow for so-called ‘narrative’ imperfectives, which do present events as completed (examples from Arregui, Rivero and Salanova, forthcoming):

- (12) Ayer moría Borges en Ginebra. (adapted from Reyes 1990)
Yesterday died-IPF Borges in Geneva
‘Yesterday Borges died (Impf) in Geneva.’
- (13) A huit heures, les voleurs entraient dans la banque, ils discutaient avec un
At eight hours, the robbers entered-IPF in the bank, they discussed-IPF with an
employé, puis se dirigeaient vers le guichet principal.
employee, then Repl directed-IPF towards the window main
‘At eight, the robbers entered (Impf) the bank, they discussed (Impf) with a clerk,
then they moved (Impf) towards the main desk.’ (adapted from Jayez 1999)

Examples of narrative imperfectives show that Spanish imperfecto and French imparfait can refer to complete events. They are different, in this sense, from the English progressive, which does not show up in narrative contexts in the same manner. For example, the English progressive version of (12) has a very different (not completive) interpretation:

- (14) Yesterday, Borges was dying in Geneva.

There is a contrast between Russian IPF and the English progressive regarding whether complete events are possible (yes for Russian IPF, not for English progressive). But there is also a contrast between Spanish imperfecto and English progressive in this respect (yes for Spanish IPF, not for English progressive). Yet Russian IPF and Spanish IPF are not the same with respect to completion. It seems that simply focusing on whether an event culminates or not is not fine-grained enough to capture relevant differences within a larger typology of partitive operators. Extending the typology of partitive operators will require distinguishing amongst different ways of being completed.

4. A partitive operator analysis of Spanish *perfecto* in comparison with *imperfecto*

Given Altshuler’s proposal, both Hindi SV-perfectives and Russian imperfectives have a modal dimension. This explains why they can both lead to true statements even if only proper stages of the relevant VP event actually realized. The event of which the VP predicate is true need not be part of the actual world. The Spanish perfecto (^{SP}PFV), traditionally characterized as a perfective aspectual operator, does not behave in the same way. Contrary to what we see with Hindi SV-perfective, it leads to truth only if the relevant VP-events are actually complete:

- (15) #Leyó la carta pero no la terminó.
Read-PFV the letter but not it finish-PFV
‘He/She read the letter but he/she did not finish it’

If we adopt Altshuler in characteriaing ^{SP}PFV as a perfective partitive operator, it would be necessary to impose a restriction to prevent the possibility of it targeting maximal event-

stages that are distinct from the complete event. In contrast to what Altshuler proposed for the Hindi SV-perfective, it would be necessary to restrict access to the stages of a VP-event that are identical to that event (this would be necessary to ensure actual completion in spite of the partitive operator semantics). A partitive operator semantics for Spanish perfecto would have to require that clause (iv) in the Spanish perfecto version of (7) be $g(e) = g(e')$ (which would render the maximality constraint in (v) trivially true). Ensuring that the Spanish perfecto has access only to maximal event stages identical to a VP-event would result in an interpretation according to which a VP event has actually been completed (particularly relevant for accomplishments such as (15)). The modal dimension that in principle can be associated with a partitive operator would in effect be invisible in the semantics.

Working with Altshuler's parameters, the question arises as to whether Spanish perfecto allows reference to plural events. The possibility of targeting stages of plural events is considered a necessary condition for a habitual interpretation for aspect. In the typology proposed in (2), Altshuler characterizes Russian and French IPFs as allowing plural events, while Hindi ^{SV}PFV and English PROG do not (the former give rise to habitual readings, the latter don't). At least at some intuitive level, Spanish perfecto does seem to allow reference to plural events. Consider the examples in (16):

- (16) a. Desde 1992 hasta 2002, Susana construyó casas y edificios de departamentos.
From 1992 until 2002, Susana built-PFV houses and buildings of apartments
'From 1992 until 2002, Susana built houses and apartment buildings'
- b. Desde 1992 hasta 2002, Susana jugó al golf.
From 1992 until 2002, Susana played-PFV to-the golf
'From 1992 until 2002, Susana played golf'

The sentences in (16) report on the regular iteration of events (repetitions of events in a regular manner) that held throughout a bounded period of time. (16a) reports on numerous and regular events of Susana building of houses and apartment buildings, and (16b) reports on numerous and regular events of Susana playing golf. This seems to suggest that Spanish perfecto can make reference to plural events. It does not, however, give rise to standard 'habitual' readings. The sentence in (17a) cannot be taken to mean that Susana had the habit of playing golf, it can only be understood episodically; (17b) does give rise to a habitual reading, glossed below:

- (17) a. Susana jugó al golf
Susana played-PF to-the golf
'Susana played golf'
- b. Susana jugaba al golf
Susana played-IPF to-the golf
'Susana used to play golf'

In the case of Spanish, it seems that the modal dimension associated with imperfective is at least as important in generating habitual readings as the possibility of appealing to plural events. Even though both imperfectives and perfectives appear able to appeal to plural events, only imperfectives give rise to habitual readings. The difference between the iteration of events and habitual generalizations becomes clear when comparing perfectives and

imperfectives in combination with adverbs of quantification. As argued by Menéndez-Benito (2005), quantificational examples with Spanish perfecto result in accidental generalizations.

- (18) Siempre que vino a mi casa, Juan fumó
Always that *pro* came-PFV to my place, Juan smoked-PFV.
'When Juan came to my place, he always smoked.'
(Menéndez-Benito 2002)

Following Goodman (1947), Menéndez-Benito (2002) characterizes accidental generalizations as those in which truth depends on what is contingently happening in the actual (evaluation) world: such generalizations are established after examining all actual cases and do not support the truth of counterfactual predictions (i.e. of the form *if Juan had come to my house on Thursday, he would have smoked*).

Spanish imperfecto, on the other hand, leads to non-accidental generalizations. Non-accidental generalizations are law-like: if a non-accidental generalization is true, it will support the truth of counterfactual predictions. As Menéndez-Benito points out, this is the interpretation associated with (19):

- (19) Siempre que venía a mi casa, Juan fumaba
Always that *pro* come-3psg-past-imp. to my place, Juan smoke-3psg-past-imp.
'When Juan came to my place, he always smoked.'
(Menéndez-Benito 2002)

In the case of Spanish, the presence/absence of a modal dimension in the truth-conditions associated with aspectual operators seems relevant to the types of generalizations they can give rise to. There is something beyond appealing to plural events that appears crucial to the types of generalizations that partitive operators can give rise to. If so, absence of habitual readings need not be considered sufficient evidence for a constraint against plural events.

It is worth noting that Spanish IPF can give rise not only to habitual readings but also to so-called 'dispositional' readings not available to Spanish PFV. The dispositional reading of (20) is glossed below:

- (20) La impresora imprimía 20 páginas por minute.
The printer printed-IPF 20 pages per minute
'The printer could print 20 pages per minute'

In its dispositional reading, (20) could be true of a printer that was accidentally destroyed without ever having been used. The imperfective in (20) conveys that the printer had the potential to print 20 pages per minute. While there is a clear modal component to (20), it is problematic to tie this to actual stages of an event that 'continues on' in another world. (20) can be true even if no printing events ever began [for an analysis of dispositional sentences in terms of existential modal quantification, the reader is referred to Menéndez-Benito (2006, 2012)]. Examples like (20) indicate that at least for Spanish IPF modal quantification should not be tied to VP-events that begin in the actual world (i.e. have actual stages) and continue in other worlds. Accounting for this kind of example may require substantial revisions to the partitive operator analysis.

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