A Finer-grained Typology of Perfective Operators

Fabienne Martin • Zsófia Gyarmathy

Abstract We argue that completion and maximality (defined through the notion of self-connectedness) both need to be taken into account as potential parameters in analyses of perfectives. Stative predicates in the French *passé composé* and *passé simple* require self-connected maximality and completion, while event (including activity) predicates require event completion only.

Keywords perfective · imperfective · maximality · self-connectedness · event completion vs. cessation · French · Hindi · Mandarin

F. Martin, Universität Stuttgart/Humboldt-Universität zu Berlin, https://sites.google.com/view/fabienne-martin
Zs. Gyarmathy, GNW Kft, Budapest, https://sites.google.com/site/zsofiagyarmathy/

1 On Existential Closure, the Perfective Aspect and Divisive Reference

Event-semantic analyses commonly assume that a (non-quantified) sentence expresses existential quantification over events, typically realized by existential closure in the derivation (e.g., Kratzer 1996), often assumed to be introduced by tense or aspect, especially in neo-Reichenbachian accounts and formalizations of Klein 1994. A typical neo-Reichenbachian definition of the perfective operator (PFV) is as follows (Bohnemeyer 2014), where P is a variable for an eventuality predicate, t_T a variable for the topic time, and g the variable assignment function parameter with respect to a model M:

(1) $[\![\text{PFV}]\!]^{M,g} = \lambda P \exists e[\tau(e) \subseteq t_T \wedge P(e)]$

The imperfective operator (IMPF) is assumed to express the inverse

relation between the topic time and the event time:

(2) $[\![\text{IMPF}]\!]^{M,g} = \lambda P \exists e[t_T \subseteq \tau(e) \wedge P(e)]$
        (Disregarding the imperfective paradox)

Another commonly assumed tenet in event semantics is that states are *divisive*, that is, they apply to all the parts of any eventuality they apply to. So if the event predicate P is divisive, then $\forall e, e'(P(e) \wedge e' \sqsubset e \rightarrow P(e'))$ holds, where $\sqsubset$ is the strict mereological part-of relation over eventualities. An often dismissed consequence of the divisive reference of states and (1) is the following: whenever $t_T \subseteq \tau(e')$ for some e' in the denotation of a stative predicate P, it follows (because of divisive reference) that $\exists e[\tau(e) \subseteq t_T \wedge P(e)]$ holds. That is, IMPF(P) entails PFV(P) for stative Ps. Therefore, whenever an imperfective is true, a corresponding perfective sentence should be truthfully assertable.

However, this is not what we always observe. Suppose that Kim has been continuously sick since yesterday. In this scenario, sentence (3) (in which a clause with the present imperfective is followed by one with the simple past) is true. But the corresponding French example (4), whose second clause contains a perfective verb in the *passé composé* (PC), is not. This is clearly unexpected: the first clause states that $\exists e[\text{now} \subseteq \tau(e) \wedge \text{kim-be-sick}(e)]$ holds, and (by assumption), that yesterday $\subseteq \tau(e)$ holds (since e began yesterday). Given the divisiveness of states, it follows that $\exists e'[\tau(e') \subseteq \text{yesterday} \wedge P(e')]$ holds (where e' is a part of e), and thus, a perfective sentence such as the second clause of (4) should be true if it expresses this meaning. But in fact, (4) is only acceptable if Kim's past state of sickness e' ceased in the past, followed by a present state of sickness e, and so that $\tau(e')$ and $\tau(e)$ are separated by a time interval t during which Kim is not sick. This suggests that the semantics in (1) and/or (2) is not correct.

(3)   Kim **is** sick, and she **was** already sick yesterday.

(4)   Kim **est**   malade, et   elle **a** déjà **été**   malade
        Kim is.3SG sick   and she be.PC.3SG already sick

hier.
yesterday.
'Kim is sick, and she was already sick yesterday.'

The same problem can be approached from a different angle. Since for stative Ps, $\text{IMPF}(P)$ entails $\text{PFV}(P)$, there is no entailment from $\text{PFV}(P)$ to $\text{IMPF}(P)$ or its negation. So if $\text{PFV}(P)$ is true, $\text{IMPF}(P)$ may be true or false as far as the definitions in (1) and (2) are concerned. But again, this is not what we observe. Data suggest that for stative Ps, if $\text{PFV}(P)$ is true, then $\text{IMPF}(P)$ is *false*, indicating a problem with (1) and/or (2). For instance, in contrast to (5) (in which a clause with the simple past is followed by one with the present imperfective), the corresponding French (6) from Schaden 2015, whose first clause contains a perfective verb in the PC and the second clause contains a present imperfective verb, is anomalous.[1] The same problem arises with a perfective verb in the *passé simple* (PS), as in (7).

(5)   There **was** a bar at the corner, and it still **is** there.

(6)   Il y   **a eu**   un bar au   coin,   #et il y   **est** toujours.
       There be.PC.3SG a   bar at-the corner   and there is   still.
       Intended: 'There was a bar at the corner, and it still is there.'

(7)   En 2000, Ana **habita**   à Paris. #Et elle y   habite
       in 2000 Ana live.PS.3SG in Paris   and she there live.PS.3SG
       toujours.
       still
       Intended: 'In 2000, Ana lived in Paris, and she still lives there.'

On a neo-Reichenbachian account like Schaden 2015, the contrast between (5) and (6) (and between (7) and its English translation) might be approached as follows. Since PFV requires the event time to be included in the topic time, asserting that the state continues to occur at utterance time leads to a contradiction. In contrast, the

---

[1]See also Smith (1991:p. 195) for a similar observation on French. Note that an ingressive/inchoative interpretation in (6) and (7) is to our ears not possible.

English simple past is not a pure perfective and also has imperfective readings (cf. Comrie 1976), hence the absence of contradiction.

However, since for stative predicates, $\text{IMPF}(P)$ may be true while $\text{PFV}(P)$ is true, no contradiction should arise in (6) in a scenario where a present 'be-at-the-corner' state was already holding in the past. The same reasoning applies to (7). This problem cannot be circumvented by an appeal to Gricean implicatures and saying that the use of the perfective implies that the corresponding weaker imperfective is false, because that does not explain the *contradiction* in (6) observed by Schaden, as the problem does not vanish in presence of *en fait* 'in fact', which usually helps to cancel Gricean implicatures:

(8) Il y a eu   un restaurant chinois dans ce
     there be.PC.3SG a   restaurant Chinese in   this
     quartier,   #et   en fait il est toujours là.
     neighborhood,   and in fact it is still   there
     Intended: 'There was a Chinese restaurant in this neighbor-
     hood, and in fact it is still there.'

Thus, existential quantification over events together with divisive reference leads to unacceptable results.

But could we not exploit the weakness of existential quantification and say that although PFV cannot be used for the French PC/PS (which don't have an imperfective use), it might be ideal for the English simple past, which is known to behave like a perfective with telic predicates (e.g., *John walked to the bank, #and he is still walking there*), and like an imperfective with atelic ones (recall (3) and (5))? More concretely, if we assume that the English simple past systematically satisfies the definition of PFV, we seem to predict exactly what we observe, namely that, when it comes to states, (i) $\text{IMPF}(P)$ entails $\text{PFV}(P)$ and (ii) if $\text{PFV}(P)$ is true, then $\text{IMPF}(P)$ may very well be true, too. However, this leads to another problem illustrated by the two potential readings of (9):

(9)   When I visited him, he was sick.

- a. topic time (*when*-clause) ⊆ event time (*be sick*)
  (Most salient reading)
- b. event time (*be sick*) ⊆ topic time (*when*-clause)
  (Marginal reading)

If we assume that the simple past in the main clause satisfies the definition of PFV (resulting in reading (9b)), we cannot account for the saliency of (9a). And notice that (9a) must be translated to French using the *imparfait* (which is an imperfective), while (9b) is preferably translated using the perfective PC. This strongly suggests that the English simple past is genuinely ambiguous, having both imperfective and perfective meanings.[2] However, even on an ambiguity analysis, if on its perfective reading the simple past encodes PFV, we arrive back at the question of why (9b) is only very marginally available, given that the perfective reading is also entailed by the (preferred) imperfective one.

So an analysis of PFV along the lines of (1) leads to problems both in the case of "pure" perfectives and the English simple past. The reason this issue has gone virtually unnoticed in the literature is that existential closure is actually mostly *disregarded* when talking about events and event times in the neo-Reichenbachian tradition and event semantic approaches in general. Authors, including Schaden (2015), often simply use the definite description "the eventuality". Thus, it is tacitly assumed that a sentence is about a specific eventuality, even though the formal analysis fails to do justice to this intuition.

---

[2]Of course, the translation facts alone do not help us select between an underspecification and an ambiguity analysis of the simple past, but together with the saliency of (9a), they are at least suggestive.

Still another view is that the English simple past is a pure past tense, and not an aspectual operator. For instance, de Swart (1998) claims that the English simple past is aspectually transparent in that it lets the lexical aspect "shine through" at the sentence level.

2 A Referential Approach to Aspect

Partee (1973) famously argued for a referential – as opposed to an existential quantificational – approach to tense. Based on cases of event anaphora, Grønn & von Stechow (2016) argued for an extension of Partee's idea to aspects, maintaining that both tenses and aspects have both a quantificational (indefinite) and a referential (definite) use. If, instead of existential closure over events, we use a variable whose reference is determined by the assignment function g (like that of t_T), as in (10), it becomes possible to capture the intuition that sentences are about specific events, and we can refer to *the* event.

(10)   a. $[\![\text{PFV}]\!]^{M,g} = \lambda P[\tau(e) \subseteq t_T \wedge P(e)]$
       b. $[\![\text{IMPF}]\!]^{M,g} = \lambda P[t_T \subseteq \tau(e) \wedge P(e)]$

Given the lack of existential quantification, $\text{IMPF}(P)$ will also no longer entail $\text{PFV}(P)$ even in the case of predicates with divisive reference.

It is still not clear, however, why the perfective in (6) cannot refer to a (specific) past be-at-the-corner state which happens to be a proper part of a larger be-at-the-corner state that still holds. One could try to solve this problem by stating that in the domain of eventualities, the uniqueness requirement attached to definites translates into a constraint that forces the specific eventuality to be *maximal* (Filip 1999, Koenig & Muansuwan 2000, Altshuler 2014), that is, to be an eventuality that *ceased*. For if the state reported in (6) is the *unique greatest* past be-at-the-corner state in the context, it cannot be part of a larger (and therefore distinct) be-at-the-corner state. One of the problems with such an argument, however, is that it predicts all definite aspects to encode maximality, including the imperfective. However, the imperfective version of (6) is, of course, unproblematic.[3]

---

[3]Positing that the imperfective only has the indefinite reading in definition (2) is undesirable, since it can be anaphoric to a familiar event in languages like Russian (Grønn & von Stechow 2016) or French. This is, for instance, the case in the following example: *Hier, Pierre a dansé comme un fou. Il dansait avec un parapluie.*

3 Combining Event Maximality with Event Completion

We propose to employ maximality not as a requirement of definite aspect but that of PFV. Our claim is that the data in section 1 offer support to Altshuler and Filip's (2014) proposal that perfectivity amounts to a *maximality requirement* that is satisfied when an eventuality is a complete VP-eventuality[4] or ceases to develop further towards a VP-eventuality in the actual world. Altshuler (2014) argued that the Hindi perfective encodes event maximality (but not event completion). The maximality requirement may be fulfilled in (11) (since the context leaves open the possibility that the eating-the-cookie event ceased in the past), where the telic VP has a nonculminating, partitive use, but not in (12), since the second clause indicates that the eating-a-cookie event is still ongoing at utterance time. Altshuler (2014) proposes that this is at the source of the infelicity observed in (12).

(11) maĩ-ne aaj   apnaa kek khaa-yaa, (aur baakii
      I-ERG today mine cake eat-PFV   and remaining
      kal   khaũũgaa).   (Hindi)
      tomorrow eat.FUT
      'I ate my cake today, (and I will eat the remaining part tomorrow).' (Singh 1991)

(12) maayaa-ne biskuT-ko khaa-yaa #aur use ab   tak khaa
      Maya-ERG cookie-ACC eat-PFV   and it now still eat
      rahii hai.   (Hindi)
      PROG be.PRS
      Intended: 'Maya ate a cookie, and is still eating it.' (Altshuler 2014)

  Note that Altshuler (2014) and Altshuler & Filip (2014) adopt a

---

'Yesterday Pierre dance.PC.3SG like mad. He dance.IMP.3SG with an umbrella.'

   [4]While it may not be the best terminology when it comes to atelics, we use "complete" as in Zucchi 1999 to express that the event falls under the respective predicate: e is complete wrt P iff $P(e)$. In contrast to accomplishments, atelics (states and activities) are "complete" as soon as they begin.

maximality requirement that inherently refers to *stages* in the sense of Landman (1992), which incorrectly precludes all perfective operators from applying to states, which do not have stages. The data in section 1 warrant a relaxation of the maximality requirement from stages to parts. For the present purposes, the definition of maximality in (13) suffices. But in section 4.3, we will show that (13) is too strong, and offer a revised version of maximality.

(13)   MAX(e, P) iff   (To be revised)

    a. e is a part of a possible P-event and

    b.   it is not a proper part of any actual event that is part of a possible P-event.

With maximality included in the definition of PFV (as in the definitions in table 1), we can account for (6) and (7). We can also explain the marginality of (9b): IMPF(P) (as analyzed in (2)) no longer entails PFV(P) for predicates with divisive reference. The contrasts in (5)–(7) are due to the fact that the English simple past has an imperfective reading, while the French PC/PS do not.[5]

Importantly, we claim that, as in Altshuler & Filip 2014 for the Russian perfective, the maximality requirement of the English simple past and the French PC/PS does not *replace* the completion requirement they are traditionally associated with, but has to be *combined* with it to prevent the perfective aspect itself from leading to partitive readings of telics (recall *John walked to the bank, #and he still is walking there*.) The cross-linguistic typology of Altshuler 2014 can thus be extended as in table 1: while the Hindi perfective encodes maximality only, the English simple past and the French PS/PC – just like the Russian perfective in Altshuler & Filip 2014 – encode maximality *and* completion. We call perfectives of the former type *weak perfec-*

---

[5]The PC has an imperfective reading when used as a universal perfect. But this use tends to require an adverbial like *toujours* 'always' or *depuis* 'since' in the PC sentence; see, for example, Schaden's (2007) example (102) *Depuis le début de l'hiver, Marie a été malade tout le temps* 'Since the beginning of the winter, Marie has been sick all the time'. No such adverbial is present in (6) (or (4)).

Perfective operator	Requires completion?	Requires maximality?	Semantics
Weak (Hindi, Mandarin)	No	Yes	$⟦\text{PFV}_M⟧$
Strong (French, English, Russian)	Yes	Yes	$⟦\text{PFV}_{C+M}⟧$

Table 1 A typology of perfective operators (To be revised)
$⟦\text{PFV}_M⟧ = \lambda P \exists e[\tau(e) \subseteq t_T \wedge \text{MAX}(e, P)]$, while
$⟦\text{PFV}_{C+M}⟧ = \lambda P \exists e[\tau(e) \subseteq t_T \wedge \text{MAX}(e, P) \wedge P(e)]$

tives, and those of the latter type *strong perfectives*. The typology will be revised in the last section.[6]

4 Three Problems Raised by Perfectives and Their Solution

4.1 Weak Perfectives and Complex Verbs

An issue raised by weak perfectives as defined in table 1 appears in languages like Hindi and Mandarin, where perfective accomplishments may have partitive readings with *simple verbs* (SVs) only, as in (11), or (14)–(17).

(14) John-ne fasal **kaaT-ii**. (Hindi)
      John-ERG crop cut-PFV.SG
      'John cut the crop (partly/entirely).'

(15) John-ne draing **miTaa-yii**. (Hindi)
      John-ERG drawing erase-PFV.SG
      'John erased the drawing (partly/entirely).'

---

[6]Note that Altshuler (2014) and Altshuler & Filip (2014) adopt a purely event mereological approach on which viewpoint aspect operators are functions from eventuality predicates to eventuality predicates, while we here remain within the neo-Reichenbachian/Kleinian tradition introduced in section 1. However, nothing hinges on this choice with respect to the questions and analyses discussed here (e.g., the issues in section 1 arise for purely event mereological approaches, too).

(16)   Wǒ zuótiān **xiě le** gěi Zhāngsān de xìn, kěshì
       I   yesterday write PFV to Zhangsan DE letter but
       méi   xiě   wán.   (Mandarin)
       NEG.PFV write finish
       'Yesterday, I wrote a letter to Zhangsan, but I didn't finish
       (writing it).' (Koenig & Muansuwan 2000)

(17)   Yuēhàn **shāo le** tā-de shū, dàn gēnběn méi
       Yuehan burn PFV 3SG-DE book but at.all   NEG.PFV
       shāo-zháo.   (Mandarin)
       burn-ignited
       'Yuehan burned his book, but it didn't get burnt at all.' (Mar-
       tin et al. 2018)

These readings are unavailable when applied to *complex* or *compound verbs* (henceforth CVs): compare, for example, (11) (which contains a SV) with (18) (which contains a CV). The contrast between (17) and (19) illustrates the same point.

(18)   maĩ-ne kek **khaa liya**,   #jo   bacaa hai wo raam
       I-ERG   cake eat   take.PFV what remain is that Ram
       khaayegaa.   (Hindi)
       eat.FUT
       Intended: 'I ate the cake (completely), and Ram will eat the
       rest.' (Singh 1994)

(19)   Yuēhàn **shāo-zháo le** tā-de shū, #dàn gēnběn méi
       Yuehan burn-ignited PFV 3SG-DE book but at.all   NEG.PFV
       shāo-zháo.   (Mandarin)
       burn-ignited
       'Yuehan burned his book, but it didn't get burnt at all.' (Mar-
       tin et al. 2018)

CVs are formally composed of two roots that can often both be used as independent main predicates outside the CV, where V1 is either a verbal root describing an event, and V2 describes the result state or the right boundary (*telos*) of a V1-event, or is a light

verb that has lost independent meaning. Both in Hindi and Mandarin, perfective CVs entail that the V1-event either has reached its right boundary (was completed) and/or has triggered a V2-result; see Singh 1991, 1994 and Altshuler 2014 for Hindi; Li & Thompson 1981, Lin 2004 and Chief 2008 for Mandarin.[7] If, as we saw in section 3, the perfective is weak in these languages, this is at first sight unexpected, given that the aspectual operator should be able to extract an initial proper part of an eventuality satisfying the CV.

Focusing on Hindi, Altshuler (2014:746) solves the issue by assuming that Hindi has two different perfective operators (hence his labels '^{SV}PFV' vs. '^{CV}PFV'). He assumes that SVs combine with the weak perfective analysed as ^{SV}PFV (which encodes event maximality only), while CVs combine with the strong perfective analysed as ^{CV}PFV (which encodes event completion). If possible, one might prefer to avoid this solution, however, given that the same morphology (namely, -(y)aa/ii) is used to express perfectivity with both types of predicates. The same problem arises in Mandarin, where perfectivity is encoded by one and the same verbal morpheme *le*.

We propose that Piñón's (2011) account for the semantic differences between English simple vs. particle verbs such as *eat* vs. *eat up* can be fruitfully extended to this semantic contrast between perfective SVs and CVs in Mandarin or Hindi. Piñón's point of departure is a suggestion made by Higginbotham (2000) that verbs may either denote predicates of events, or of *ordered pairs of events*. Piñón proposes that verbs like *eat* may come in two variants, as in (20a) and (20b), where b is a variable for boundary events, and 'V+' indicates that b is the boundary of e, see (20c).[8]

---

[7]But see Koenig & Muansuwan 2000 on the view that Thai perfective CVs only strongly imply rather than entail event completion.

[8]Note that we left out from Piñón's (2011) representations the internal argument and the thematic role he assumes to be introduced by the verb. Instead, we assume (in the spirit of Distributed Morphology) that the verbal root *eat* – and its Mandarin or Hindi counterparts – introduces an event argument only, while the internal argument and the patient thematic role are introduced by a separate head.

(20)   a.   eat $\rightsquigarrow \lambda e.\mathbf{eat}(e)$
        b.   eat up $\rightsquigarrow \lambda\langle e,b\rangle.\mathbf{eat}^+(\langle e,b\rangle)$
        c. $\forall\langle e,b\rangle(\mathbf{V}^+(\langle e,b\rangle) \to b = \mathbf{right\text{-}boundary\text{-}of}(e) \wedge b \sqsubset e)$

The strategy we propose consists in treating Hindi and Mandarin CVs as denoting predicates of ordered pairs of events, like *eat up* does in (20b), while SVs denote predicates of events. If V2 is an achievement verb, Piñón's analysis hardly needs any modification in order to be extended to CVs in these languages. Interestingly, many so-called "vector verbs," that is, predicates or auxiliaries used in the V2-position of CVs in Indo-Aryan (Hindi, Marathi), Dravidian (Tamil, Malayalam), and Turkic (Tatar) languages have a literal meaning expressed in English by achievement(-like) verbs such as *finish, leave, go, come, reach, put, throw, fall* – see Maisak 1999 for a rich inventory of these verbs. This corroborates the idea that V2 is a boundary-denoting (achievement) predicate in at least some CVs. For instance, Hindi *khânâ* 'eat' can be attributed the same meaning as *eat* in (20a), and the corresponding CV (formed with the light verb *li* 'take') the meaning in (20b). Similarly, the Mandarin SV *guān* 'close' can be analysed as in (21a), and the corresponding CV *guān-shàng* 'close up', containing the movement verb *shàng* 'rise', as in (21b), where '$\mathbf{V}^-(b,s)$' (in the spirit of (20c)) indicates that b is the left boundary of s, and, by the axiom about events and their caused result states in (21c), we also assume the right boundary of e in (21b).

(21)   a.   *guān* 'close' $\rightsquigarrow \lambda e.\exists s(\mathbf{cause}(e,s) \wedge \mathbf{closed}(s))$
        b.   *guān-shàng* 'close up' $\rightsquigarrow \lambda\langle e,b\rangle.\exists s(\mathbf{cause}(e,s) \wedge$
              $\mathbf{closed}^-(b,s))$
        c. $\forall\langle e,b\rangle\forall s((\mathbf{cause}(e,s) \wedge \mathbf{V}^-(b,s)) \to (\mathbf{V}(s) \wedge$
              $b = \mathbf{right\text{-}boundary\text{-}of}(e) \wedge b = \mathbf{left\text{-}boundary\text{-}of}(s)))$

When V2 is a state predicate, or a non-punctual event predicate, Piñón's analysis has to be modified further. A different relation (typically a causal relation in so-called resultative verbal compounds) holds between the eventualities respectively expressed by the first

and second members of the ordered pair. For instance, the simple and complex Mandarin variants of the causative verb *burn* can be analysed as follows.[9]

(22)   a.   *shāo* 'burn' ⤳ $\lambda e.\exists s(\textbf{cause}(e,s) \wedge \textbf{burnt}(s))$
       b.   *shāo-zháo* 'burn-ignited' ⤳ $\lambda\langle e,s'\rangle.\exists s(\textbf{cause}(e,s) \wedge$
            $\textbf{burnt}(s) \wedge \textbf{cause}(e,s') \wedge \textbf{ignited}(s'))$

The price of such an analysis is that the denotations are more complex type-logically, but the contrast in terms of completion entailment can now be accounted for. When a weak perfective applies to a CV denoting a predicate of ordered pairs of events, it applies to an ordered pair of events that is maximal with regard to the CV, that is, $\mathsf{MAX}(\langle e,e'\rangle, \mathsf{V1.V2})$. For instance, the perfective form of *shāo-zháo* 'burn-ignited' receives the semantics in (23) (and the MAX operator must now, of course, be extended to accept event pairs as argument):

(23)   PFV[*shāo-zháo*] ⤳ $\exists\langle e'',s''\rangle(\tau(\langle e'',s''\rangle) \subseteq t_T \wedge$
       $\mathsf{MAX}(\langle e'',s''\rangle, \lambda\langle e,s'\rangle.\exists s(\textbf{cause}(e,s) \wedge \textbf{burnt}(s) \wedge$
       $\textbf{cause}(e,s') \wedge \textbf{ignited}(s'))))$

The maximality requirement is satisfied either by a pair of events which is a complete V1.V2-pair of events, or by a pair of events which is an incomplete V1.V2-pair of events that ceases to develop further in the actual world. But crucially, an incomplete *pair* of events must still be a pair of (incomplete) events; an ordered pair of events cannot be made up of an initial part of the first member of the pair only. Therefore, a perfective CV requires at least a part of a V2-boundary or of a V2-result to occur. Since a boundary is an atomic object without proper parts (Piñón 1997), CVs whose V2 is boundary-denoting entail event completion, which is the result desired. When V2 is a

---

[9]We follow Martin et al.'s (2018) proposal according to which Mandarin SVs such as *shāo* 'burn' are causative (bi-eventive) predicates. Also, note that predicates are often categorically underspecified and can be both used as a verb or an adjective; we assume that in a causative CV, V1 is used as a verb, introducing an event leading to a state s, and V2 introduces a state s'.

state predicate, the ensuing perfective CV minimally entails a proper part of a V2-state, which is again what we observe. In both cases, event completion is ensured with CVs despite weak perfectivity, due to the requirement that a V2-event fragment be instantiated.[10] By contrast, the perfective of a causative SV does not entail the existence of a state s satisfying the property encoded by the SV, see (24).

(24) $\mathsf{PFV}[sh\bar{a}o] \rightsquigarrow \exists e'(\tau(e') \subseteq t_T \wedge \mathsf{MAX}(e', \lambda e.\exists s(\mathbf{cause}(e,s)$
        $\wedge \, \mathbf{burnt}(s))))$

4.2 Ongoing Readings after Perfective Activities

As we saw in section 1, states in the perfective do not allow for an ongoing eventuality in French. We have also noted that the addition of *en fait* 'in fact' does not lead to acceptability, indicating that cessation is not simply an implicature of the perfective. The main data can be illustrated as follows (note that cessation is entailed both with predicates denoting states that normally last a long time, as in (25a)–(25c), and predicates denoting states whose lifespan can be very short, as in (25d)):[11]

---

[10]When the Mandarin CV contains a gradable result predicate V2, it is left open whether or not the result satisfies V2 to a maximal degree. What is required is that an eventuality of the V2-type occurs, exactly as expected if MAX combines with CVs having a semantics such as (22b): (22b) leaves open whether the result state s' satisfies the predicate *ignited* to a maximal degree or not. For instance, Martin et al. (2018) report the following example to be non-contradictory:

(i)   Lulu shāo-zháo le nèi-běn shū, dàn shū méi   wánquán zháo.
       Lulu burn-ignite PFV that-CL book but book NEG.PFV completely ignite
       'Lulu burned that book, but the book didn't get completely burnt.'

[11]However, as already observed by Smith (1991) about a similar French example, (25d) sounds better if we admit the existence of an iteration of sick-states, which we will account for below.

(25) a. L'année passée, Pierre **a habité**   à Paris #et il y
          the.year last   Pierre live.PC.3SG in Paris and he there
          habite   toujours.
          live.PRES.3SG still
          Intended: 'Last year, Pierre lived in Paris, and he still
          lives there.'

      b. Il y **a eu**   un restaurant chinois dans ce
          There be.PC.3SG a restaurant Chinese in   this
          quartier,   #et en fait il est   toujours là.
          neighborhood, and in fact it be.PRES.3SG still   there
          Intended: 'There was a Chinese restaurant in this neigh-
          borhood, and in fact it is still there.'

      c. Marie a été   plus grande que son frère   (#)et
          Marie be.PC.3SG more tall   than her brother and
          elle l'est   toujours.
          she that.be.PRES.3SG still
          Intended: 'Marie was taller than her brother, and still is.'

      d. Ce matin   Pierre **a été**   malade (#)et il
          this morning Pierre be.PC.3SG sick   and he
          l'est   toujours.
          that.be.PRES.3SG still
          Intended: 'Pierre was sick this morning, and he still is.'

We have argued that these data, given the divisive reference of stative
predicates, present a challenge to most traditional approaches that
assume that aspect introduces existential quantification over events
and PFV simply requires event completion. However, the question
may arise as to what the case is with activities, which are also as-
sumed to have divisive reference, albeit only down to minimal parts.
The surprising observation is that in the case of activities in the PC-
perfective, an ongoing-event interpretation *is* possible, as the follow-
ing felicitous French examples show:

(26) a. Ce matin   Pierre **a travaillé** et il travaille
          this morning Pierre work.PC.3SG and he work.PRES.3SG

toujours.
still
'This morning, Pierre was working (lit.: worked) and he
is still working.'

b. Ce matin   Pierre **a travaillé** et   il
this morning Pierre work.PC.3SG and he
n'a pas arrêté   depuis lors.
NEG.stop.PC.3SG since then
'This morning, Pierre was working (lit.: worked) and he
hasn't stopped working since then.'

c. Maya **a mangé** des cookies   (ce midi), et   elle en
Maya eat.PC.3SG of   cookie.PL (this noon) and she of
mange   toujours (depuis lors).
eat.PRES.3SG still   (since then)
'Maya was eating (lit.: ate) cookies (at noon today), and
she is still eating (since then).'

Crucially, an ongoing-event interpretation in these cases is possible
both with and without the interruption of the event that makes the
perfective true. (And note that in English, this ongoing-event inter-
pretation raises problems with the simple past, as already noted in
Smith 1999, which justifies our translation with a progressive). More-
over, this contrast between states and activities holds up even if only
a *minimal part* of the relevant activity has been completed, as evi-
denced by the following pair of examples (and note that (27b) is fine
once Armstrong is back in his spaceship).

(27)   (Context: Neil Armstrong took his first step on the moon and
is still walking.)

a. Armstrong **a marché**   sur la lune!
Armstrong walk.PC.3SG on the moon
'Armstrong has walked on the moon!'

b. #Armstrong **a été**   sur la lune!
Armstrong be.PC.3SG on the moon
Intended: 'Armstrong has been on the moon!'

This contrast between states and activities, and the activity data, in particular, are highly puzzling in view of our proposed analysis of the French PC as involving both completion and maximality: if, for instance, in (27a), the PC form for 'walk on the moon' can only be made true by maximal walkings-on-the-moon, how come it can be felicitously used in a situation when it is obviously made true by a non-maximal activity? Should we give up, given this data, our proposal that PC requires maximality? While such a move would certainly explain the felicity of (27a) and its ilk, we would then be hard put to account for the data concerning states and the issues detailed in section 1. In particular, if the PC did not require maximality, how can the infelicity of (25) and (27b) be explained? The problem is not specific to French, since in Mandarin and Hindi, too, an ongoing-event context is less problematic for perfective activities than perfective states. For instance, (28) in Hindi is far from being categorically rejected by our informants[12] (although it is still marked for most of them), and the same is true of sentences like (29) in Mandarin.[13]

---

[12]*Pace* Singh (1991:11), who categorically rejects ongoing readings with perfective activities (see her (25)).

[13]To our knowledge, the case of perfective statives with pure stative readings is not very much discussed in Hindi and Mandarin. In Mandarin, the combination of the verbal *-le* with stative predicates very often forces an inchoative interpretation: see, for example, Lin 2004 (and note that although this inchoative reading is very often *optional* in French, the literature tends to focus exclusively on it to the detriment of the pure stative reading). In the rare cases where perfective states have a truly stative meaning in Mandarin, the ongoing interpretation is odd, see, for example, (i). As for Hindi, our informants converge on the view that a perfective stative sentence such as (ii) is very marked, too.

(i)   Shàng gè yuè,   Lùlu zài Bālí **dāi le** shí-tiān, #tā hái dāi zài Bālí.
       last   CL month Lulu at Paris stay PFV ten-day 3SG still stay at   Paris
       Intended: 'Last month, Lulu stayed in Paris for ten days, and she still is staying in Paris.'

(ii)   mayaa is   hotel me **ruk-ii**,   #aur ab   tak ruki hai.
        maya   this hotel in   stay.PFV.SG and now still stay be.PRS
        'Maya stayed in this hotel, and she is still staying there.'

(28)   mayaa-ne khanaa **kha-yaa**, (?)aur ab   tak khaa rahii
       Maya-ERG food   eat-PFV, and   now still eat   PROG
       hai.
       be-PRS
       'Maya ate, and she is still eating.'

(29)   Lùlu jīntiān zǎoshàng **pǎo le** bù, (?)yìzhí pǎo
       Lulu today   morning run PFV step all.along run
       dào xiànzài.
       up.to now
       'Lulu ran this morning, and she has been running until now.'

We therefore propose to retain our previous account of the French
PC (as well as Mandarin *le* and Hindi *-(y)aa/ii*) as requiring maxi-
mality, and instead claim that some difference between states and
activities should account for the difference in the availability of an
ongoing-event interpretation in their cases (although we ultimately
prefer the alternative solution provided in the next section).

We here tentatively propose that the crucial factor in this respect
is the not entirely homogeneous nature of activities, as opposed to
states. Since at least Taylor 1977 and Dowty 1979, the received view is
that states have divisive reference down to instantaneous parts, while
activities do so only down to some small, "minimal" parts that are
sufficiently big enough to allow them to be classified under the rel-
evant predicate. For instance, *walk* can only hold true of at least one
step-sized events, while states like *be* hold at all subintervals (down
to instants) of any interval at which they hold. We hypothesize that
French speakers are sensitive to this difference to the extent that they
are able to construe the end of a minimal part of an activity and the
subsequent tiny pause until the next substantial minimal part com-
mences as cessation. More concretely, the idea is that in an example
such as (26a), the activity *e* reported in the first clause may be con-
ceived as maximal with respect to the predicate *travailler* 'work': *e*
does cease in the past and is therefore not a proper part of a bigger

and still on-going working-activity, but is rather followed by another activity e' of the same type.

In fact, Rothstein (2004) already suggested a systematic ambiguity of referring to minimal parts only, or to members of the set formed from them through closure under join. Albeit she argued (for English) that only "naturally atomic" activities can access these minimal parts, while "ordinary" activities unambiguously denote the set (let us call it **P** following Rothstein) formed through closure under join from them, there appears to be no reason to exclude native speakers from accessing the minimal parts. In fact, **P** of course includes these minimal parts (by definition, since they are the smallest events that *can* make true an activity of a given type). As such, we expect that predicates like *marcher* 'walk' can refer to minimal events like steps, and given this, there is no reason to exclude native speakers from construing tiny pauses following them as intervals at which the activity *ceases* to hold – which satisfies the requirement of maximality. In contrast, since states are true down to instants, no such pause is encountered which would constitute enough grounds to assume the cessation of the state at any moment in time (up until the state does cease).[14]

Although such an explanation may prove difficult to validate (and we will see in the next section that maximality as defined in (13) raises an even more serious problem with cumulative predicates), one piece of evidence that we take to at least weakly reinforce it concerns verb iterations. Verb iterations in French can be used to signal unexpectedly long eventualities, and are readily available for activities, as the following example shows:

(30) Pierre travailla,   travailla,   travailla   dans son
      Pierre work.PS.3SG work.PS.3SG work.PS.3SG in   his

---

[14]And note that in a context such that a pause may be conceived between different **P**-states, the ongoing reading sounds much better. For instance, (25d) is acceptable if one assumes the occurrence of two different states of sickness (although the adverbial *de nouveau* 'again' fits better this context than *toujours* 'still').

bureau.
office
'Peter was working, and working, and working in his office.'

In contrast, this construction is not acceptable in the case of states:[15]

(31)   #Pierre resta,   resta,   resta   dans son bureau.
       Pierre stay. PS.3SG stay.PS.3SG stay.PS.3SG in   his office
       Intended: 'Peter was staying for a long time in his office.'

One potential explanation for this difference between activities and
states with respect to verbal iteration may be based on the sensitiv-
ity of French speakers to tiny pauses between minimal parts of ac-
tivities. Thereby, a longer activity (of, say, working) may be divided
into some smaller chunks, and the numerousness of these chunks
indicated through verbal iteration (note that it is not uncommon in
languages to use iteration to signal plurality or intensification).

    A second piece of evidence that might be taken to support our
proposal that French speakers can construe minimal activities as
maximal activities comes from counting facts. Let as assume that
we can felicitously utter the following iterated form, suggesting a
long drawing session:

(32)   Sascha a   dessiné (et) dessiné (et) dessiné.
       Sascha have.3SG draw.PC (and) draw.PC (and) draw.PC
       'Sascha was drawing, and drawing, and drawing.'

---

[15]Verb iteration may be possible with more activity-like states (such as 'sit' or
'stand'), and it may likewise be available for "action-dependent states" like *être
bête* 'be stupid', e.g. (i) below, but all these predicates pattern with activities for
the ongoing-event use (they raise no infelicity in sentences such as (25)).

(i)   Il a été   bête, bête, bête.
       he be.PC.3SG stupid stupid stupid
       'He was stupid, stupid, stupid.'

A faithful translation of (i) is difficult to give: it may either have an intensive read-
ing, but potentially also a reading where each stative predicate in the sentence is
meant to capture a different state of stupidity manifested through different actions.

In this context, *plusieurs fois* 'several times' is a true answer to the following question, suggesting that French speakers can construe the situation as *several* drawing events having taken place.[16]

(33) Combien de fois Sascha a dessiné?
      how many of times Sascha draw.PC.3SG
      'How many times was Sascha drawing?'
      (Lit.: 'How many times did Sascha draw?')

Still, the data in (26) remain puzzling, for we do not need to assume that the reported activity took place several times to make these sentences felicitous. Additionally, the difference between French, which accepts ongoing-event interpretations after perfective activities, and English, which does not (see the literal translations of (26)), is left completely unexplained.

4.3 The Notion of Maximality

Atelic predicates combined with the MAX operator as defined in (13) raise another and related issue.[17] To illustrate the problem, suppose that L is a stative predicate, for example, $\lambda e.\text{kim-be-sick}(e)$ (see our example (4)). It is generally assumed that stative and activity predicates are cumulative. For L to be cumulative means the following: for every event (state) e, e', if $L(e)$ and $L(e')$ each hold, then $L(e \oplus e')$

---

[16]Note that *être malade* 'be sick' patterns with activities in this respect, differently from the predicates in (25a) and (25b) (cf. *Il a été malade plusieurs fois* 'He was sick several times', vs. #*Il y a eu plusieurs fois un restaurant chinois dans la rue* 'There was several times a Chinese restaurant in the street', acceptable only if there were different times when there was a Chinese restaurant there, which then closed down, then another opened, etc.).

Unsurprisingly, *une seule fois* 'only once' is clearly an appropriate answer to (33), too. This difference is reminiscent of counting ambiguities in Hungarian, where, depending on the type of the verbal predicate ("ordinary" activity, strictly semelfactive, strictly iterative, ambiguous semelfactive/iterative), counting of minimal events and/or counting of maximal events may be possible or required (see Gyarmathy 2017).

[17]We are grateful to Chris Piñón, who drew attention to the problem posed by cumulativity and suggested self-connectedness as a solution (pers. comm.).

also holds, where $e \oplus e'$ is the mereological sum of e and e'. Now consider an event (state) e_1 such that $L(e_1)$ holds. Let us ask whether $\mathsf{MAX}(e_1, L)$ also holds according to the definition of MAX (13) and repeated in (34).

(34) $\mathsf{MAX}(e_1, P)$ iff
    a. e_1 is a part of a possible P-event and
    b. e_1 is not a proper part of any actual event that is part of a possible P-event.

Clearly, (34a) is satisfied for $P = L$ because $L(e_1)$ holds: any actual L-event is also a possible L-event. If e_1 is the biggest actual L-event, then (34b) also holds. The problem, however, is that this second condition is unlikely to be satisfied in many realistic scenarios. For example, let us suppose that e_1 is an event (state) in which Kim is sick during time t_1, that e_2 is an event (state) in which Kim is sick during time t_2, and that t_1 and t_2 are separated by an interval of time t' during which Kim is not sick. More formally, we basically have the following:

(35)   a. $L(e_1) \wedge \tau(e_1) \subseteq t_1$
    b. $L(e_2) \wedge \tau(e_2) \subseteq t_2$
    c. $\neg \exists e'(L(e') \wedge \tau(e') \subseteq t') \wedge t_1 < t' < t_2$

Since L is (by assumption) cumulative, it follows from (35a)–(35b) that $L(e1 \oplus e2)$ also holds. (In other words, the state $e1 \oplus e2$ is also one in which Kim is sick.) Given the scenario described in (35), let us reconsider whether $\mathsf{MAX}(e_1, L)$ holds. Again, (34a) is satisfied: e_1 is an actual L-event, hence e_1 is also a possible L-event. But notice now that (34b) is not satisfied: e_1 is (on the contrary) a proper part of an actual event (namely, $e_1 \oplus e_2$) that is a part of a possible L-event ($e_1 \oplus e_2$ is an actual L-event, hence also part of an actual L-event, hence also part of a possible L-event). Consequently, $\mathsf{MAX}(e_1, L)$ does not hold in the scenario in (35). (Similarly, $\mathsf{MAX}(e_2, L)$ does not hold in this scenario. But if $e_1 \oplus e_2$ is the biggest actual L-event, then $\mathsf{MAX}(e_1 \oplus e_2, L)$ does

hold). Consider now the following French sentence (cf. (4)):

(36)   Kim fut/a été   malade.
       Kim be. PS/PC.3SG sick
       'Kim was sick.'

Suppose that we represent (36) as we recommended:

(37) $\exists e(L(e) \wedge \tau(e) \subseteq t_T \wedge \mathsf{MAX}(e, L))$

Applying the scenario described in (35), imagine that a speaker has e_1 and t_1 in mind when she asserts (36), that is, the event that she asserts to exist is e_1 and the reference time t_T is t_1. The problem is that, as argued above, the third condition in (37), namely, $\mathsf{MAX}(e, L)$, is *false* in the case where $e = e_1$. This is a problem because intuitively, (36) is *true* in the case where the speaker is talking about e_1 and t_1. (Note that the speaker may not even know about e_2/t_2.) Analogous scenarios can be applied to other examples of stative or activity predicates (assuming that such predicates are cumulative), so the conclusion is that the definition of MAX adopted in (13) is, in fact, too strong.

We could try to propose another notion of maximality that fares better. One possibility is to use the mereotopological notion of *self-connectedness*. Intuitively, the idea is that an event is self-connected just in case it does not contain any spatiotemporal gaps. (Self-connectedness can be formalized using the notion of connectedness, which in turn is based on the notions of boundary and internal part.) In the scenario described in (35), e_1 and e_2 are (by assumption) each self-connected, but $e_1 \oplus e_2$ is not self-connected, because there is a gap between e_1 and e_2. The notion *maximal self-connected* ($\mathsf{MAX\text{-}sc}$) could be defined as follows (where sc stands for "self-connected" and $\mathsf{part}(P)$ for the predicate true of events that are (possibly improper) parts of possible P-events):

(38) $\mathsf{MAX\text{-}sc}(e, P)$ iff

    a. $\mathsf{part}(P)(e)$ and
    b. $\mathsf{sc}\,(e,\mathsf{part}(P))\,\wedge$
         $\neg\exists e'(\mathsf{part}(P)(e')\wedge\mathsf{sc}\,(e',\mathsf{part}(P))\wedge e\sqsubset e')$

In prose, e is maximal self-connected with respect to P iff e is a part
of a possible P event (see (34a)), e is self-connected, and there is
no e' such that e' is part of a possible P-event, e' is self-connected,
and e is a proper part of e'. The French sentence in (36) can now be
represented as follows:

(39) $\exists e(L(e)\wedge\tau(e)\subseteq t_T\wedge\mathsf{MAX\text{-}sc}(e,L))$

The formula in (39) is true in the case where the speaker has in mind
e_1 for e and t_1 as the value of t_T, which correctly reflects the fact
that (36) is intuitively true in this case. In particular, the existence of
the later L-event e_2 does not render (36)/(39) false, precisely because
$e_1\oplus e_2$ is not self-connected even though it is (as before) an L-event.

    Note, however, that the definition in (38) helps for states, but it
does not draw a distinction between states and activities. So our
examples in (26) remain puzzling if $\mathsf{MAX\text{-}sc}$ is used for activities as
well.

    One solution is to say what we suggested for these examples in
section 4.2: in (present) terms of maximal self-connectedness, the ac-
tivities described in the first clauses of (26) are (contrary to appear-
ance) really maximal self-connected after all, for they are separated
from each other by pauses, albeit very small. When sentences in (26)
are taken to describe a single, still ongoing activity, this activity is
strictly speaking not self-connected (much like $e_1\oplus e_2$ with respect
to L above).

    Another solution is to posit a sortal distinction between states and
events proper, such that the condition of maximal self-connectedness
applies to states but not to events. More precisely, we would extend
the typology of perfectives proposed in section 3 as in table 2. Be-
side strong perfectives (encoding event completion *and* event self-
connected maximality) and weak perfectives (encoding event self-

Perfective operator	Requires completion?	Requires maximality?	Semantics
Weak (Hindi, Mandarin)	No	Yes	$[\![\text{PFV}_M]\!]$
Standard (French)	Yes	No	$[\![\text{PFV}_C]\!]$
Strong (French, English, Russian)	Yes	Yes	$[\![\text{PFV}_{C+M}]\!]$

Table 2 A typology of perfective operators (revised version).

connected maximality only), we would keep the standard perfective, encoding event completion only. In languages like English, the perfective is always strong, which accounts for why ongoing-event interpretations after perfectives are infelicitous (recall the literal translations of (26)). But for languages such as French, a strong perfective (encoding completion *and* self-connected maximality) is selected for state predicates, see (40b), and a standard perfective (encoding completion, but not self-connected maximality) is selected for event predicates, see (40a).

(40) a. $[\![\text{PFV}_C]\!]^{M,g} = \lambda P.\exists e(\tau(e) \subseteq t_T \wedge P(e))$
      b. $[\![\text{PFV}_{C+M}]\!]^{M,g} = \lambda P.\exists s(\tau(s) \subseteq t_T \wedge P(s) \wedge \mathsf{MAX\text{-}sc}(s, P))$

The definition given in (40b) is simply the neo-Reichenbachian definition of the perfective (cf. (1)), but now restricted to predicates P of events proper.

It may sound at first sight rather unattractive to posit two different meanings for the very same perfective morphologies in French (the PC and the PS) according to whether they combine with stative or eventive predicates. However, observe that the sortal distinction put aside, (40b) only adds a condition – the self-connected maximality requirement – to (40a). (40b) is therefore simply a stronger version than (40a). And, in fact, we see an independent reason for positing that the perfective form is semantically stronger when it combines with stative predicates. The relevant observation is that the most obvious alternative to the perfective PS/PC, namely the imperfective

form (the *imparfait*) is semantically weaker when combined with stative predicates than when used with eventive predicates. In particular, when combined with statives, the *imparfait* seems able to express the "event time $\subseteq$ topic time" relation characteristic of the perfective, too. In this perspective, it is less surprising that perfective forms get a specialized, strengthened meaning with stative predicates. We propose that the additional maximality requirement in (40b) with stative predicates reflects exactly this.

To illustrate that the imperfective is semantically weaker when combined with stative predicates than when combined with eventive predicates, let us compare sentences (41a) and (41b).

(41) a. #La semaine passée, Paul lisait   ta   lettre.
         the week   last   Paul read.IMP.3SG your letter
         Intended: 'Last week, Paul read your letter.'
      b. La semaine passée, Paul était   malade/triste.
         the week   last   Paul be.IMP.3SG sick/sad
         'Last week, Paul was sick/sad.'

Out of the blue, (41a) is odd. The reason for this is that with eventive predicates, the *imparfait* has no other choice than expressing the imperfective relation "topic time (*last week*) $\subseteq$ event time (*read your letter*)," which clashes with the assumption that one does not read a letter during a whole week (and note that the problem of (41a) vanishes if we replace the VP by, for instance, *travaillait sur son papier* (work.IMP.3SG on his paper), for it is not unusual to work on a paper during a whole week). This is why such sentences feel incomplete: the reader expects a subsequent clause providing a topic time which could satisfy the aspectual relation "topic time $\subseteq$ event time" without clashing with common assumptions (e.g., ... *quand tout à coup, son mobile s'est mis à sonner* 'when suddenly, his mobile started ringing').

Let us now look at the stative sentence (41b). Such an imperfective sentence can obviously mean that Paul was sick (or sad) the whole week and perhaps even longer. This corresponds to the imperfec-

tive meaning standardly attributed to the *imparfait*, see (42a). Now, imagine that a speaker met Paul for lunch on Monday last week, got to know that Paul was sick at that time $t_1 \subseteq$ monday, and does not know when Paul recovered exactly, that is, does not know, for any time t after t_1, whether Paul is still sick at t. Our observation is that in this scenario, (41b) is *also* true. But note that this second scenario corresponds to the *perfective* meaning (42b), since t_1 is included in Monday, and therefore also included in the topic time provided by the adverbial *last week*.

(42)   a. $\exists e(\mathsf{sick}(e) \land \mathsf{last\ week} \subseteq \tau(e) \land \mathsf{theme}(e, \mathsf{paul}))$
       (imperfective reading)
     b. $\exists e(\mathsf{sick}(e) \land \tau(e) \subseteq \mathsf{last\ week} \land \mathsf{theme}(e, \mathsf{paul}))$
       (perfective reading)

Note that (41b) is unacceptable if the speaker knows Paul recovered last week. In other words, with statives, the *imparfait* can express (1) (the standard perfective), but not (40b) (the strong perfective).

     That the *imparfait* can convey the aspectual configuration encoded by perfectives when combined with stative predicates is also confirmed by the felicity of the dialogue in (43):

(43)   a.   La semaine passée, tu étais malade,
       the week   last   you be.IMP.2SG sick
       n'est-ce pas?
       QUESTION TAG
       'Last week you were sick, weren't you?'
     b.   Oui. J'ai été malade lundi et mardi.
       yes I be.PC.1SG sick   Monday and Tuesday
       'Yes, I was sick on Monday and Tuesday.'

The addressee answering (43b) most probably knows when he recovered. If he asserts that he was sick on Monday and Tuesday, he conveys the information he was not sick anymore from Wednesday on. And crucially, this assertion is presented through *oui* 'yes' as a ratification of the truth of (43a). This confirms that the imperfective

sentence (43a) can convey the perfective meaning (42b).

In summary, the *imparfait* can only have an imperfective meaning when combined with eventive predicates. But when combined with stative predicates, the same morphology can additionally convey the same meaning as the standard perfective we have in (1), cf. (42b). We propose that this explains why the perfective morphology, when combined with stative predicates, gets its meaning strengthened and specialized, through the self-connected maximality requirement.

5 Conclusion

At this point, an interesting parallel emerges between the English simple past and the French *imparfait*: with stative predicates, these two forms can express both imperfectivity and perfectivity. This flexiblity probably reflects the division of labour between aspect markers in these two languages, although in a different way. English has no aspect marker compatible with stative predicates and expressing imperfectivity only (the progressive is typically not acceptable with statives). It is therefore not surprising that the form in charge of expressing perfectivity – the simple past – may also convey imperfectivity with statives. By contrast, French has an imperfective form compatible with statives, but this form has also perfective uses with these predicates, thus competing with the aspectual forms which are 'perfective only' (the PS and the PC) to express perfectivity with statives. It therefore comes as no surprise that the perfective aspect markers – the PS and the PC – get a strengthened perfective meaning when combining with states.

References

Altshuler, D. (2014). A typology of partitive aspectual operators. *Natural Language & Linguistic Theory*, *32*(3), 735–775.

Altshuler, D., & Filip, H. (2014). Perfectivity as maximization over event stages. Paper presented at the *Chronos 11*, SNS, Pisa, 16–18 June 2014.

Bohnemeyer, J. (2014). Aspect vs. relative tense: The case reopened. *Natural Language & Linguistic Theory*, *32*(3), 917–954.

Chief, L. (2008). *Scalarity and incomplete event descriptions in Mandarin Chinese*. Ph.D. thesis, The State University of New York at Buffalo.

Comrie, B. (1976). *Aspect: An Introduction to the Study of Verbal Aspect and Related Problems*. Cambridge University Press.

de Swart, H. (1998). Aspect shift and coercion. *Natural language and Linguistic Theory*, *16*, 347–385.

Dowty, D. R. (1979). *Word Meaning and Montague Grammar*. Dordrecht: D. Reidel.

Filip, H. (1999). *Aspect, Eventuality Types, and Nominal Reference*. New York: Routledge.

Grønn, A., & von Stechow, A. (2016). Tense. In M. Aloni, & P. Dekker (Eds.) *The Cambridge Handbook of Formal Semantics*, (pp. 313–341). Cambridge University Press.

Gyarmathy, Zs. (2017). Semelfactives in English and in Hungarian: A countability-based analysis. In N. Brandel (Ed.) *Proceedings of IATL 2016*, vol. 86 of *MIT Working Papers in Linguistics*, (pp. 57–76). Cambridge, MA: MITWPL.

Higginbotham, J. (2000). On events in linguistic semantics. In J. Higginbotham, F. Pianesi, & A. Varzi (Eds.) *Speaking of Events*, (pp. 49–79). Oxford: Oxford University Press.

Klein, W. (1994). *Time in Language*. London: Routledge.

Koenig, J.-P., & Muansuwan, N. (2000). How to end without ever finishing: Thai semi-perfectivity. *Journal of Semantics*, *17*(2), 147–182.

Kratzer, A. (1996). Severing the external argument from its verb. In J. Rooryck, & L. Zaring (Eds.) *Phrase Structure and the Lexicon*, (pp. 109–137). Dordrecht: Springer Netherlands.

Landman, F. (1992). The progressive. *Natural Language Semantics*, *1*, 1–32.

Li, C. N., & Thompson, S. A. (1981). *Mandarin Chinese: A Functional Reference Grammar*. Berkeley: University of California Press.

Lin, J. (2004). *Event Structure and the Encoding of Arguments: The Syntax of the Mandarin and English Verb Phrase*. Ph.D. thesis, MIT.

Maisak, T. (1999). Multiple periphrastic perfectives: another case of bounder perfectivization. Ms.
URL http://lingvarium.org/maisak/publ/index-eng.htm

Martin, F., Demirdache, H., Liu, J., & Sun, H. (2018). Monomorphemic verbs in Mandarin Chinese: Lexical aspect, event structure and non-culminating uses. Ms, Humboldt-Universität zu Berlin and Université de Nantes.

Partee, B. H. (1973). Some structural analogies beween tenses and pronouns in English. *Journal of Philosophy*, *70*, 601–609.

Piñón, C. (1997). Achievements in an event semantics. In A. Lawson, & E. Cho (Eds.) *Proceedings of SALT 7*, (pp. 273–296). Ithaca, NY: CLC Publications.

Piñón, C. (2011). Event structure in event semantics (Aspectual composition with structured denotations). Paper presented at *Chronos 10*, Aston University, Birmingham, 18-20 April 2011.

Rothstein, S. (2004). *Structuring Events. A Study in the Semantics of Lexical Aspect*. Malden, MA: Blackwell Publishing.

Schaden, G. (2007). *La Sémantique du Parfait. Etude des "Temps Surcomposés" dans un Choix de Langues Germaniques et Romanes*. Ph.D. thesis, Paris 8.

Schaden, G. (2015). An intersective account of localising temporal expressions. In K. Paykin, & C. Majolino (Eds.) *Telling Time*, (pp. 39–71). Cambridge: Cambridge Scholars Publishing.

Singh, M. (1991). The perfective paradox: Or how to eat your cake and have it too. In L. Sutton, C. Johnson, & R. Shields (Eds.) *Proceedings of the Seventeenth Annual Meeting of the Berkeley Linguistics Society*, (pp. 469–479).

Singh, M. (1994). *Perfectivity, Definiteness, and Specificity: A Classification of Verbal Predicates in Hindi*. Ph.D. thesis, University of Texas at Austin.

Smith, C. (1991). *The Parameter of Aspect*. Dordrecht: Kluwer.

Smith, C. (1999). Activities: states or events? *Linguistics and Philosophy*, *22*, 479–508.

Taylor, B. (1977). Tense and continuity. *Linguistics and Philosophy*, *1*, 199–220.

Zucchi, S. (1999). Incomplete events, intensionality and imperfective aspect. *Natural Language Semantics*, *7*(2), 179–215.