Semantic competition over morphological representations. A case study from Slavic[*]

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1 Introduction

This paper investigates some cross-linguistic differences in aspectual interpretations of Slavic and Romance languages. We observed that certain readings cannot be determined compositionally from the syntactic representation but instead they result from semantic competition over available morphological representations. We argue that there are certain last resort interpretations, namely, type-shifting and shifts to possible worlds, that may be used to rescue a derivation that would not otherwise be interpretable. Crucially, such a rescue strategy is limited only to some structural environments.

Consider the sentence in (1) from Czech. As we can see, an utterance with an imperfective verb modified by an *in*-adverbial lacks an episodic reading.[1]

(1)   #Petr   četl   Vojnu a   mír   za dvě hodiny.
       Petr.Nom read.Imperf War   and Peace in two hours
       'Petr was reading War and Peace in two hours.'

[1]We approximate the intended reading by the English progressive.

The structure is not ungrammatical though. In fact it has a – often unnoticed – *bounded ability* reading, highlighted by the context in (2). The relevant reading may be paraphrased as 'There was a time in the past in which Petr was able to finish reading of War and Peace in two hours and in fact he did it at least once'. Crucially, for this reading to be judged true it is sufficient if there was only one verifying instance of the event in the actual world. It suffices if other instances of the event were possible; they don't need to have been instantiated.

(2) Když Petr studoval rychločtení, tak četl   Vojnu a mír   za
     when Petr studied   speed-reading then read.Imperf War   and Peace in
     dvě hodiny.
     two hours
     'When Petr took a course in speed-reading, he was reading War and Peace
     in two hours./... he was able to read War and Peace in two hours.'

Interestingly, a parallel construction in Romance, here exemplified by Spanish (3), may have a non-episodic reading as well. The truth-conditions are stronger, though, in that one verifying instance of the event is not sufficient for the utterance to be judged true. This becomes apparent once the utterance is followed by something like 'but she did it only once'. While this is a plausible continuation of (2), it yields a contradiction if preceded by (3). The Spanish reading is thus best characterized as a habitual reading which implies the ability reading of (2) but is stronger in its truth-conditional requirements.[2]

(3) Frida ensayaba   el libreto en una hora.
     Frida rehearsed.Imperf the libretto in one hour
     'Frida used to rehearse the libretto in one hour.'   *Spanish*
                                          (Cipria and Roberts, 2000, p. 307, (15b))

The observed pattern is puzzling for two reasons. Typically, imperfective morphology is ambiguous between some form of a generic reading (which the habitual reading is an instance of) and an episodic reading. It is not immediately clear why the episodic reading is blocked in case the imperfective verb is modified by an *in*-adverbial. What is even more puzzling is that the Czech pattern lacks even the habitual reading found in Romance and instead it instantiates an ability reading with an actualization requirement.

We argue that in order to account for the attested readings we need to consider

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[2]We approximate the habitual reading by the English 'used to' construction.

differences in temporal anchoring properties of these two families of languages and differences in the presuppositional content of their aspectual morphology. We provide evidence that Romance and Slavic have different presuppositions associated with Perfective and Imperfective morphology. Concretely, the Czech Perfective morphology presupposes existence of an event followed by a hiatus (we will call this presupposition the *Activity presupposition*). Following Heim's Maximize Presupposition principle we argue that the Czech Perfective morphology may be used only for Telic events (either achievements, or accomplishments) as they vacuously satisfy the hiatus requirement. Crucially, the Romance perfective morphology lacks the Activity presupposition which affects the mapping between Imperfective events and (a)telic events in these languages. As for the ability reading attested in Czech, we argue that the reading results from a a conflict between an existential assertion and the lack of presupposition associated with the Imperfective morphology. Consequently, temporal anchoring cannot be resolved in the actual world. Instead the grammar opts for a systematic repair strategy, namely, a shift to possible worlds, similar to the interpretation of counterfactuals. In particular, the existential assertion induces a requirement on one verifying instance for the truth-conditions of the utterance to come true. Other events are modalized, i.e., realized only in possible worlds, resulting in the ability reading. As we will see, this repair strategy is not restricted to Aspect but can be found in other places of the grammar where there is some compositional mismatch. Suggestive evidence comes from the modal interpretation of middles.

The paper is organized as follows. First, we summarize differences between Romance and Slavic aspect (sec. 2.1) and introduce our assumptions about the Aspectual semantics for these two groups of languages (sec. 2.2). Section 2.3 refines our semantics by introducing presuppositional differences. Section 3 applies these conclusions to the ability reading by introducing first the habitual reading (sec. 3.1) and then restricting the Czech reading to only one verifying instance (sec. 3.2).

2 Romance versus Slavic Aspect

2.1 The (a)telicity mapping puzzle

We follow Giorgi and Pianesi (2001b, among others) in that Perfectivity/Imperfectivity and Telicity/Atelicity need to be treated as two distinct semantic phenomena.[3,4] The (Im)Perfective distinction may be characterized with respect to the reference time and the event time (Klein, 1994), while the difference between Telicity and Atelicity may be characterized either in terms of homogeneity of the event (where only Atelicity is homogeneous), or in the number of the events (Higginbotham, 2000) (where Atelicity consists of exactly one event).[5] Crucially, while the Perfective/Imperfective distinction is a matter of lexical denotation, the Telic/Atelic distinction may arise through semantic and pragmatic inferences.

If we assume that the Perfective and Imperfective morphology cross-linguistically receives the same interpretation,[6] then we expect – everything else being equal – that the mapping between the (Im)Perfective morphology and the (a)telic interpretation should not vary across languages.[7] However, this prediction is not borne out. In Romance (at least in Spanish and Italian), the Imperfective morphology is always interpreted as atelic and the Perfective morphology is ambiguous between telic and atelic, while in the Slavic languages (at least in Czech and Russian) the mapping is reversed, i.e., the Imperfective morphology may be telic or atelic but the Perfective morphology is telic. The differences are schematized in (4)–(5). Examples demonstrating them are given in (6)–(9).[8]

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[3]While for Giorgi and Pianesi (2001b) there is a connection between the type of event and (a)telicity, some authors, for example, Bertinetto (2001), deny even this connection. Since the relation between the event type and (a)telicity is not directly relevant to our puzzle we will leave the details aside.

[4]In Slavic Telicity usually coincides with Perfectivity. For example, in Czech almost all morphologically Perfective verbs formed by perfectivizing prefixes are Telic. The only exception is verbs prefixed by *pro-*.

[5]But see, for example, Filip (2008) for the view that having a terminating point is a property of telic events. In particular, it is a result of a conventional implicature and as such it doesn't belong to the core semantic meaning of Aspect.

[6]In section 2.2 we will define the lexical entry of the Perfective morphology as the INCLUDES relation and the lexical entry of the Imperfective morphology as the INCLUDED relation.

[7]Later in the paper (sec. 2.3) we will argue that in fact everything is not equal.

[8]The examples are not entirely parallel because of non-trivial differences in the information structure realization and the usage of definite articles. We minimize the differences by sticking to definite descriptions in the Czech examples.

(4) *The mapping between the morphology and its interpretation in Romance:*

Morphology	Interpretation
Imperfective ——→	Atelic
Perfective ——→	Telic

(5) *The mapping between the morphology and its interpretation in Slavic:*

Morphology	Interpretation
Imperfective ——→	Atelic
Perfective ——→	Telic

(6) *Spanish Imperfecto is always atelic* (Cipria and Roberts, 2000, p. 304-305, (10-11))

    a.   Corría   petróleo por   las cañerías.
          flow.3SG.IMPF oil   through the pipes
          'Oil flowed/was flowing through the pipes.'   `atelic/*telic`

    b.   Corrían   3000 litros de petróleo por   las cañerías.
          flow.3PL.IMPF 3000 liters of oil   through the pipes
          '3000 liters of oil flowed through the pipes.'   `atelic/*telic`

(7) *Spanish Préterito can be telic or atelic* (Cipria and Roberts, 2000, p. 305, (12-13))

    a.   Corrió   petróleo por   las cañerías.
          flow.3SG.PERF oil   through the pipes
          'Oil flowed through the pipes.'   `atelic`

    b.   Corrieron   3000 litros de petróleo por   las cañerías.
          flow.3PL.PERF 3000 liters of oil   through the pipes
          '3000 liters of oil flowed through the pipes.'   `telic`

(8) *Czech Imperfective can be atelic or telic*

    a.   Tenhle obraz   maloval   Lada.
          this   painting painted.IMPF Lada
          'Lada painted this picture.'   `telic`

    b.   Tenhle obraz   maloval   Lada, ale bohužel   ho
          this   painting painted.IMPF Lada but unfortunately him
          nedokončil.
          not-finished
          'Lada started painting this picture but unfortunately he didn't finish it.'   `atelic`

(9) *Czech Perfective can be only telic*

    a.   Tenhle obraz   namaloval Lada.
          this   painting painted.PF Lada
          'Lada painted (and finished) this picture.'   `telic`
    b. #Tenhle obraz   namaloval Lada, ale bohužel   ho nedokončil.
          this   painting painted.PF Lada but unfortunately him not-finished
          # 'Lada finished painting this picture but unfortunately he didn't fin-
          ish it.'   `*atelic`

The mapping differences are puzzling. One could argue that the denotation of the Imperfective and Perfective morphology varies across languages, or the difference in the mapping needs to be attributed to a third factor. The latter is the route we will take in this paper: in particular, we will argue for a uniform denotation of Perfect and Imperfect and we will attribute the difference in the mapping to differing presuppositions associated with the Aspectual morphology. We will provide evidence that the Czech Perfective morphology carries a presupposition that is not present in the Spanish Perfect. Because of the presence of the presupposition the mapping is subject to semantic competition parallel to semantic competition independently argued for other morphological features carrying presuppositions, such as determiners, ϕ-features, or number marking (Heim, 1991; Sauerland, 2002, 2003; Sauerland et al., 2005). As we will see, the difference in the presuppositional content of the aspectual morphology is one of the crucial ingredients of the Czech ability reading.

2.2   The semantics of the Perfective and Imperfective morphology

In order to argue that a third factor is responsible for the mapping differences observed in the previous section, we need to first establish that it is reasonable to assume that the denotation of the aspectual morphology does not interestingly differ between Slavic and Romance. In the following sections we will look mostly at Czech and Spanish but as far as we were able to establish the same findings carry on to Russian and Italian and possibly they distinguish Slavic and Romance languages in general.

One of the crucial differences between these languages concerns temporal anchoring of events and its grammatical realization. As Giorgi and Pianesi (2001a) observed, Romance Imperfectives lack temporal anchoring. As the examples in (10) and (11) show, Romance imperfective utterances are judged as infelicitous unless a temporal anchoring is lexically provided. Situational anchoring is not

sufficient. In contrast, situational temporal anchoring is sufficient for the Czech Imperfective morphology. For instance, (12) would be felicitous in a context in which the speaker has a small daughter Frida, you entered their office and saw their desk covered by bits and pieces of a chewed apple. Crucially, Spanish (11) uttered at the very same context would still be judged as infelicitous.

(10)   a.   #Mario mangiava una mela.
               Mario ate.Imperf an   apple
               'Mario ate an apple.'
        b.   Alle tre   Mario mangiava una mela.
               at   three Mario ate.Imperf an   apple
                                  Italian; (Giorgi and Pianesi, 2001a, (3–4))

(11)   #Frida (se) comía   una manzana.
        Frida SE   ate.Imperf an   apple
        'Frida ate an apple.'

                                         Spanish

(12)   Frida jedla   jablko.
        Frida ate.Imperf apple
        'Frida ate an apple.'   *Czech*

Consequently, since the grammatical realization of Imperfect in Romance lacks temporal anchoring, the grammatically Past Imperfective may combine with a future-oriented adverb in Spanish, (13), and Italian, (14). On the other hand, since the Czech imperfective structure includes a temporal anchoring, the temporal interpretation of the grammatical tense and the temporal adverb must coincide, as witnessed by (15).

(13)   Frida se iba   mañana.
        Friday SE left.Imperf tomorrow
        'Friday intended to leave tomorrow. (But in the end she didn't)'

                                         Spanish

(14)   Mario partiva   domani.
        Mario left.Imperf tomorrow
        'Mario had the intention/was committed to leave tomorrow.'
                               Italian (Giorgi and Pianesi, 2001a, (7a))

(15)   *Marie odjížděla   zítra.
        Marie left.Imperf tomorrow

                                         Czech

The differences in temporal anchoring are important for our understanding of the cross-linguistic differences in the interpretation of the aspectual morphology. As the examples in (16) demonstrate, Spanish Imperfect is ambiguous between progressive,[9] habitual and intentional reading (Cipria and Roberts, 2000, among others).

(16)   *Possible meaning of Spanish Imperfecto* (Cipria and Roberts, 2000, p. 300, (2))

    a.   Ibamos   a la playa cuanda nos   encontramos con
          go.1pl.Imperf to the beach when   RECPR meet.1pl.Pret with
          Miguel.
          Miguel
          'We were going to the beach when we ran into Miguel.'

                                              `progressive`

    b.   Ibamos   a la playa los domingos.
          go.1pl.Imperf to the beach on Sundays
          'We went/used to go to the beach on Sundays.'

                                              `habitual`

    c.   Hasta ayer,   íbamos   a la playa de vacaciones, pero
          until   yesterday go.1pl.Imperf to the beach on vacation   but
          hoy   Pepa dijo   que no hay dinero para   eso.
          today Pepa say.3sg.Pret that not there is   money for that
          'Up until yesterday we were going to the beach on vacation, but
          today Pepa said that there is no money for that.

                                  `intention in the past`

However, since the intentional reading arises only if there is a discrepancy between the time of the event and the aspectual morphology, i.e., only if the Imperfective morphology lacks a temporal anchoring (Giorgi and Pianesi, 2001b), the only two readings to consider are the progressive and the habitual reading.

    The Czech Imperfective at first sight behaves differently from its Spanish counterpart. However, the seeming differences are caused by the more complex morphological formation of Czech aspectual forms that brings in an additional meaning component.[10] Once we separate the additional morphology, similari-

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[9]Note that the Romance progressive is not semantically identical to the English progressive (Bonomi, 1997).

[10]Czech Imperfective and Perfective verbs may be modified by a large number of prefixes and infixes that encode rather specific lexical meanings usually described under the label 'Aktionsart'.

ties between the two languages emerge. As can be seen in (17), Czech morphologically simplex imperfectives are ambiguous between progressive and habitual reading.[11]

(17) *Only morphologically simple Imperfectives are ambiguous between progressive and habitual:*

    a.   Jeli   jsme   na pláž, když jsme   potkali Michala.
           driven Aux.1pl to beach when Aux.1pl met   Michal
           'We were driving to the beach when we ran into Michal.'

                                                  `progressive`

    b.   O nedělích jsme   často jeli   na pláž.
           on Sundays Aux.1pl often driven to beach
           'Often on Sunday we drove to the beach.'   `habitual`

The Aspectual semantics of Romance and Slavic languages thus does not seem to be entirely different. Consequently, it should be plausible to define a common lexical entry for the Imperfective and Perfective morphology in Slavic and Romance. For purposes of this paper, we define the denotation of the aspectual semantics within event semantics. We follow the intuition that the Imperfective aspect corresponds to a situation seen from the inside but a situation described by the Perfective aspect is seen from the outside (completed). From this point of view, aspect connects event time with reference time (Klein, 1994).[12] Spelling

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In the rest of the paper, we will mostly abstract from this additional morphology but will shortly return to it in the end of section 3.2.

    [11]More complex morphological forms have only the habitual reading, as seen in (i). This is because verbs morphologically derived from simple Imperfectives are either Perfective or habitual.

(i) *More complex Imperfectives may have only the habitual reading:*

    a.   #Jezdívali jsme   na pláž, když jsme   potkali Michala.
           driven   Aux.1pl to beach when Aux.1pl met   Michal
           'We were driving to the beach when we ran into Michal.'

                                               `#progressive`

    b.   O nedělích jsme   jezdívali na pláž.
           on Sundays Aux.1pl driven   to beach
           'We drove/used to drive to the beach on Sundays.'   `habitual`

    [12]According to Dowty (1979) and Landman (1992), among others, at least some aspectual phenomena must be treated within intensional semantics. In this paper we mostly stick to characterization of (Im)Perfectivity in terms of extensional semantics (in line with Klein (1994) and Paslawska and von Stechow (2003)) as most of the data we examine do not call for intensional treatment. Reference to modality will become necessary once we turn to the ability reading at-

out possible relations between event time and reference time allows us to distinguish two basic semantic relations: INCLUDES and INCLUDED. We can make a further step and define the denotation of the Aspectual morphemes in terms of INCLUDES and INCLUDED as well, as in (18) (e is an event or a state, $\tau(e)$ stands for a time trace of the event).

(18)   *Lexical entries for the Aspectual morphemes [to be modified]:*

    a.   ⟦ **perfective** ⟧ = $\lambda P \lambda t \exists e. \tau(e) \subseteq t$ & P(e)   ∼INCLUDES

    b.   ⟦ **imperfective** ⟧=$\lambda P \lambda t \exists e. t \subseteq \tau(e)$ & P(e)   ∼INCLUDED

The INCLUDES/INCLUDED semantics captures the difference between Perfective and Imperfective but it does not say anything about its relation to (a)telicity. For the semantics of (a)telicity we follow Giorgi and Pianesi (2001b). In their event semantics, telic events consist of two separate events: activity (process), e_1, and result, e_2. Under this view telic events are not homogeneous. As we can see in (19) and (20), the semantic denotation from (18) allows us to derive both the atelic and telic interpretation of the Czech Imperfective morphology. This is a desirable result because we know that the Imperfective morphology is indeed attested both with the telic and the atelic interpretation.

(19)   *Atelic interpretation of Imperfective:*

    a.   Petr včera   četl   tu knihu.
            Petr yesterday read.IMPF that book
            'Yesterday Petr read the book.'

    b. $\exists e \exists x [read(e) \wedge Agent(Petr, e) \wedge t(e) \wedge Theme(x, e) \wedge book(x)]$

(20)   *Telic interpretation of Imperfective:*

    a.   Petr včera   četl   tu knihu.
            Petr yesterday read.IMPF that book
            'Yesterday Petr read/finished reading the book.'

    b. $\exists <e_1, e_2> \exists x [read<e_1, e_2> \wedge Agent(Petr, <e_1, e_2>) \wedge$
        $Theme(x, <e_1, e_2>) \wedge book(x)]$

Note that (20) with its telic interpretation still remains semantically Imperfective, as can be seen on its interpretation which intuitively means that the process part of the event holds before the reference time. More formally, e_2 holds at a time which is a subset of *yesterday* while e_1 extends before the time of *yesterday*.

More careful work needs to be done here but we believe that it is legitimate

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tested in Czech.

to pursue a hypothesis that the difference between the Romance and the Slavic Aspectual mapping does not lie in the semantics of Perfect/Imperfect *per se* but it must be attributed to something else. The goal of the next section is to figure out what the additional factor is.

2.3 Perfective v. Imperfective Morphology and their Presuppositions

We argue that Perfective and Imperfective do not differ only in the relation of the reference time and the event time. In Czech the Perfective morphology imposes a precondition on the context that is not present in the case of the Imperfective morphology. In particular, we argue that the Perfective morphology presupposes the existence of the beginning of the event, roughly the first homogeneous part of telic events (e_1). Consequently, since only the beginning of the event is presupposed, it is entailed that the event is not homogeneous, hence there is a hiatus between the first and subsequent event(s).[13] We will call this presupposition *Activity presupposition*.[14] In contrast, the Czech Imperfective has no such presupposition. That we deal with a presupposition not with another type of inference can be shown by projecting properties of the Activity presupposition: the Activity presupposition projects under negation and under a question operator, (21)–(22). The expected properties are found in other structural environments as well, for example, the Activity presupposition does not project from the antecedent of a conditional, as in (23).[15]

(21)   *Activity inference survives under negation only in Perfective:*

      a.   Jan   nedopsal   knihu.
           Jan.Nom neg-wrote.Perf book.Acc
           'Jan didn't finish writing a book.'
           → *Jan started writing a book*

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[13]The relation to the hiatus will be relevant for the habitual v. ability reading.

[14]Even though we use the notion of semantic presuppositions here, we are not entirely convinced that this is the correct characterization. It is plausible that this type of precondition is a secondary presupposition derived from the event representation of Perfective, along the lines of the analysis of soft presupposition triggers in Abusch (2010).

[15]Notice that even if the presuppositions are secondary presuppositions, the projecting properties clearly show that we deal with some form of presupposition and not other type of inference.

b. Jan   nepsal   knihu.
Jan.Nom neg-wrote.Imperf book.Acc
'Jan didn't write a book.'
↛ *Jan started writing a book*

(22) *Activity inference survives in questions only in Perfective:*

a. Dopsal   Jan   knihu?
wrote.Perf Jan.Nom book.Acc
'Did Jan finish writing a book?'
→ *Jan started writing a book*

b. Psal   Jan   knihu?
wrote.Imperf Jan.Nom book.Acc
'Did Jan write a book?'
↛ *Jan started writing a book*

(23) *Activity presupposition of the antecedent does not project*

a. Pokud Jan   dopsal knihu, tak si   ho Marie
if   Jan.NOM wrote.PF book.ACC then REFL him Marie
vezme.
gets-married
'If Jan finished writing a book, Marie will marry him.'
↛ *Jan started writing a book*

b. Pokud Jan   psal   knihu, tak si   ho Marie
if   Jan.NOM wrote.IMPF book.ACC then REFL him Marie
vezme.
gets-married
'If Jan wrote a book, Marie will marry him.'
↛ *Jan started writing a book*

In contrast, neither Spanish Perfective nor Imperfective carries such a presupposition, as witnessed by (24) and (25).

(24) *There is no Activity presupposition projection in Spanish questions:*

a. ¿Escribia   ayer   Maria un poema?
wrote.Imperf yesterday Maria a   poem
'Did Maria write a poem yesterday?'
↛ *Maria started writing a poem*

b. ¿Escribió ayer   Maria un poema?
wrote.Perf yesterday Maria a   poem

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'Did Maria write a poem yesterday?'
↛ *Maria started writing a poem*

(25)   *There is no Activity presupposition projection under negation in Spanish:*

    a.   Ayer   Maria no escribia   una poema.
        yesterday Maria not wrote.Imperf a   poem
        'Yesterday Maria didn't write a book.'
        ↛ *Maria started writing a poem*

    b.   Ayer   Maria no escribio   una poema.
        yesterday Maria not wrote.Perf a   poem
        'Yesterday Maria didn't write a book.'
        ↛ *Maria started writing a poem*

Crucially, even though the Czech Imperfective morphology does not have the Activity presupposition, it is still compatible with the presupposition, as can be seen in (26). However, this is not a presupposition since it can be cancelled, as shown in (27).

(26)   *Imperfective may have an Activity inference*

    a.   (A museum guide standing in front of a painting:)
    b.   Tenhle obraz   maloval   Lada.
        this   picture.Acc painted.Imperf Lada.Nom
        'Lada painted this picture.'
        → *Activity inference*

(27)   *Imperfective does not need to have an Activity inference*

    a.   (A teacher about a picture one student chose to copy for his art class:)
    b.   Petr   maluje   tenhle obraz.   Ale ještě si
        Petr.Nom paints.Imperf this   picture.Acc but not-yet REFL
        nekoupil   ani barvy.
        not-bought.PP even colors
        'Petr is supposed to paint this picture. But he even has not bought colors yet.'
        → *no Activity inference*

We argue that in order to capture the Czech presuppositional facts, the lexical entry of the Czech Perfective must be enriched by the Activity presupposition.[16] We state the Activity presupposition in terms of a homogeneous part of an event. The lexical entry thus requires a proper part of the whole event (e') such that the whole event is the terminative counterpart of e' and for all time intervals of e' the predicate P holds. There is no such presupposition for the Imperfective morphology. The final lexical entries for the Czech Perfective and Imperfective morphology are given in (28).

(28)   *Lexical entries for the Czech Aspectual morphemes [final]:*

    a.   ⟦ **perfective** ⟧ = $\lambda P \lambda t \exists e: \exists e'(ter(e') = e) \wedge \forall t' \subseteq \tau(e')(P(e'))$. $\tau(e) \subseteq t$ & $P(e)$

    b.   ⟦ **imperfective** ⟧$= \lambda P \lambda t \exists e.$ $t \subseteq \tau(e)$ & $P(e)$

Now we are finally in the position to address the asymmetry in the usage of the Perfective and Imperfective morphology in Czech. We argue that the asymmetry is a result of semantic competition. Whenever a pair of morphological items differ with respect to presupposition α and if the given context satisfies α, then the item presupposing α must be used. This principle is known as the Maximize Presupposition principle and has been first suggested in Heim (1991), following Hawkins (1991) and other work in lexical pragmatics (see also Sauerland 2002, 2003; Sauerland et al. 2005; Heim 2008).[17]

Consequently, whenever the activity part is presupposed, the Perfective morphology must be used. Since the Imperfective morphology is compatible with asserting the activity event but does not presuppose the activity event, the Czech Imperfective morphology can be either telic or atelic. To sum up, the presuppositional facts and the Maximize Presupposition principle give us the asymmetry in

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[16]We simplify here. Czech Perfectives are mostly formed by some additional morphological material (prefix or infix), they can never be simplex. Consequently, it is not clear whether it is the additional morphology or the Perfective structure *per se* that carries the presupposition. An anonymous reviewer brought to our attention that, for instance, in Bulgarian, the Imperfective/Perfective distinction is cumulatively realized within the Tense affix as in Spanish and interestingly the available readings are parallel to Spanish as well. It is likely that a complete empirical picture of Slavic and Romance Aspectual differences will have to take into account the exact type of morphological distinctions and will have to consider the role of morphological markedness in a fuller detail than it can be done in this paper. We will thus leave to further empirical investigation whether all Perfective formations in Czech and in Slavic in general behave in this way or whether further refinement is needed.

[17]We would like to thank Roni Katzir for his suggestion to use the Maximize Presupposition principle to account for the morphological asymmetry.

the usage of the Czech aspectual morphology without affecting our compositional semantics. Presumably, the asymmetry in the Romance morphology is caused by the Romance Imperfective morphology positing more requirements on the context than its Perfective counterpart. We leave the question of Spanish presuppositions for future research.[18] To summarize, it is reasonable to assume that the lexical denotation of Perfect and Imperfect is the same in Czech and Spanish but the languages differ when it gets to presuppositions associated with their Aspectual morphology. Consequently, the usage of the Aspectual morphology in Czech is not identical to the usage of the Aspectual morphology in Spanish. In the following section we will investigate whether the presuppositional difference might be also behind the habitual v. ability reading differences.

3 The ability versus the habitual reading

We are finally in a position to address the question of the Czech bounded ability reading attested for sentences like (1), repeated below. As we have seen, the question has two subparts: First, how come the *in*-adverbial blocks the episodic reading typically associated with the Imperfective morphology. Second, how come there is no habitual reading either and instead the only attested reading is the bounded ability reading. Note that the first subquestion holds for Romance as well, thus the answer should reflect the common properties of the Slavic and Romance Imperfective morphology. In contrast, the second subquestion is Czech (or Slavic) specific and thus it is likely to follow from the presuppositional differences between the languages.

(1)   Petr   četl   Vojnu a   mír   za dvě hodiny.
       Petr.Nom read.Imperf War   and Peace in two hours
       'Petr was reading War and Peace in two hours.'   #episodic
       'Petr used to read War and Peace in two hours.'   #habitual
       'Petr was able to read War and Peace in two hours.'   ✓ability

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[18]One must still be careful about the lexical denotation of various Slavic prefixes though. The fact that Imperfective does not have the Activity presupposition does not mean that the Imperfective morphology cannot combine with a prefix which carries a presupposition. The question of the presuppositional content of various aspectual prefixes cannot be fully addressed in this paper but it will become relevant for the discussion of predictions made by the current proposal in the end of section 3.2.

Subsection 3.1 addresses the first part of the question by looking in detail at how the structure of (1) gets compositionally interpreted. This will help us clarify at which point of the derivation the problem for the episodic reading emerges and in turn will make it easier to see the logically plausible options for repairing the structure. The actual process responsible for the difference between the Romance habitual and the Czech bounded ability reading will be discussed in section 3.2.

3.1 Temporal adverbs and reversal of the event time and the reference time

Let's consider how exactly the structure of (1) gets compositionally interpreted. In the first step of the derivation, we merge V, *read*, with the object, *War and Peace*. The resulting phrase, VP, is aspectually underspecified: the only semantic information comes from the lexical semantics of the verb. In this particular case, the VP can obtain either an accomplishment or an activity interpretation. In the next derivational step, the adverbial *in two hours* is merged.[19] For concreteness, we assume that *in*-adverbials, in contrast to *for*-adverbials, are two-event taking functions: process and telos (Higginbotham, 2000). For *for*-adverbials one event suffices. If we apply this semantics to our example, after the adverbial *in two hours* is merged, the structure receives the accomplishment interpretation: if an one-event interpretation were selected, the structure would not be interpretable. Furthermore, we assume that the event time of the accomplishment is anchored to the reference time. For accomplishments, the event time should be a subset of the reference time, otherwise the result subevent would be outside of the reference time of the event.

In the next step, Imperfective Asp^0 is merged. The Imperfective aspect requires the event time to be a superset of the reference time. However, the accomplishment semantics of vP gives us the opposite relation. Unless the structure is further modified by something that can reverse the relation of the reference time and the event time, the episodic reading is predicted to be ungrammatical. As we have seen, this prediction is indeed borne out both in Romance and Slavic.

Interestingly, if the problem lies in the relation of the event time and the reference time, it follows that the structure could be rescued if it was possible to reverse the relation of the two relevant times. As we have seen this is indeed possible: the

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[19]Let's assume for concreteness that the adverb adjoins to vP but other structures would do as well.

habitual reading is an instance of such a reversal (Dowty, 1979, among others).[20]

(29) *Imperfective verbs may combine with in-adverbials*
   a. When John was in a better shape, he was running marathon in two hours.
   b. After John took a summer course in speed-reading, he was reading War and Peace in two hours.

The question is how exactly the reversal arises. There are two hypotheses to consider. The reversal might arise either by a free insertion of a type-shifting (habitual) operator (Dowty, 1979; de Swart, 1998, 2000; van Geenhoven, 2005; Boneh and Doron, 2008, among others), or it could be an instance of aspectual coercion (Dowty, 1979, and much consequent work). Under the type-shifting operator hypothesis, a habitual operator can freely combine both with Imperfective and Perfective verbs.[21] If it combines with an Imperfective verb, the resulting reading is habitual, as in (29).

According to the coercion hypothesis, Imperfective is inherently ambiguous between progressive and habitual reading. The semantics of an *in*-adverbial should be compatible only with the habitual reading. If Imperfective combines with an *in*-adverbial, the progressive is impossible. Consequently, the habitual reading is the only remaining possibility. This hypothesis thus predicts that if Imperfective is ambiguous, we should always get the habitual reading.

In other words, while according to the type-shifting hypothesis the habitual reading is a result of a special operation and as such might be further restricted, the coercion hypothesis predicts that the habitual reading should always be an option. As can be seen in Czech (30), the availability of the habitual (or ability) reading is in fact limited. Thus the prediction made by the coercion hypothesis, unlike the prediction made by the type-shifting hypothesis, is not borne out.

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[20]Similarly, Perfective verbs may combine with a *for*-adverbial combination receiving a *frequentative* reading (Zucchi and White, 2001; van Geenhoven, 2004, 2005, among others).

(i) *Perfective verbs may combine with for-adverbials* (from van Geenhoven 2004)
   a. John discovered crabgrass in his yard for 6 weeks. (Dowty, 1979, p. 63)
   b. I discovered water under my sink for a month. (Partee, p.c.)
   c. The prospectors struck oil for two weeks. (Mittwoch, 1991, p. 79)

[21]If the operator combines with a Perfective verb, the resulting reading is frequentative. For purposes of this paper we put the frequentative reading aside.

(30) #Když měl Petr lepší auto, tak jel do Prahy za dvě hodiny.
　　　when had Petr better car,　then drove to Prague in two hours
　　　'When Petr had a better car, he was driving to Prague in two hours.'

Crucially, both hypotheses share the assumption that what looks like an ability reading is an entailment of the habitual reading. This cannot be correct because as we have already seen the Czech ability reading is compatible with the 'only once' interpretation which is impossible in the case of a true habitual or a frequentative reading.

(31) *In Czech,* once-*adverbial may modify the ability reading but not the frequentative reading:*

　　a.　*Petr jednou objev-OVA-l　　　　na zahrádce plevel.
　　　　Petr once　discover-FREQ-Past.Perf at garden　crabgrass
　　　　'*Petr once used to discover crabgrass in his garden.'
　　b.　Po letním kursu rychločtení　　Petr jednou četl
　　　　after summer course of-speed-reading Petr once　read.Imperf
　　　　Vojnu a　mír　za dvě hodiny.
　　　　War　and Peace in two hours
　　　　'After taking a summer course in speed-reading, Petr was once reading War and Peace in two hours.'

Interestingly, a reading very similar to the Czech bounded ability reading appears outside of the Aspectual domain, namely, in a certain type of reflexive constructions resembling English middles, as in (32). Unlike English middles, this construction requires (at least) one verifying instance and possibility of pluralization of the event.

(32) V tomhle stroji　se　káva praží dobře.
　　　in this　machine coffee roasts well
　　　'Coffee roasts well in this machine.'

Even though this construction is often characterized as generic or habitual, it differs from both of them in that it requires a verifying instance (unlike true generics) and in that one verifying instance is sufficient (unlike habituals).

　　Despite these difficulties we would like to suggest that the Czech ability reading is indeed compatible with the type-shifting operator hypothesis, i.e., we side with van Geenhoven (2005) and others in that both in Slavic and Romance the pluralization of events arises via a habitual operator. We argue, however, that in order

to obtain the relevant reading we need to consider the presuppositional content of the Aspectual morphology as well.

3.2 Maximize Presupposition and the Habitual reading

We argue that in order to account for the ability reading in Czech we need to adopt a version of the type-shifting operator hypothesis. For concreteness, we will use the definition of a habitual operator given in (33).[22]

(33)   (after van Geenhoven 2004, p. 158, (60))
$$\maltese^t V(x) \; at \; t = 1 \Longleftrightarrow \exists t'(t' \subseteq t \wedge V(x) \; at \; t' \wedge number(t') > 1 \wedge \forall t'(t' \subseteq t \wedge V(x) \; at \; t' \rightarrow \exists t''(t'' \subseteq t \wedge (t'' > t' \vee t'' < t') \wedge V(x) \; at \; t'' \wedge \exists t'''(t' < t''' < t'' \vee t' > t''' > t'' \wedge \neg V(x) \; at \; t''))))$$

According to this definition, for an event to be pluralized, there must be a hiatus between iterated instances of the event. This non-overlap requirement introduces boundedness of the iterated event. Consequently, since pluralized events are bounded, the iterated event is compositionally combinable with an *in*-adverbial.

We can go one step further though. Notice that the operator asserts the existence of a hiatus. Consequently, there must be an activity preceding the hiatus. We argue that this is the semantic source of the actuality requirement of habitual readings. In other words, the actuality follows from pluractification of the event and not from the Aspectual semantics *per se* (see Piñón 2003 for a related discussion). Furthermore, the hiatus assertion and the semantics of *in*-adverbials limit this type of pluralization to telic events.

Even though this is a good result we still face the question why there is only one verifying instance needed in Czech while the other instances of the event may be shifted to possible worlds, i.e., why the reading attested in Czech is an ability reading instead of the habitual reading attested in Romance.

We would like to suggest that the ability reading results from a conflict between the hiatus assertion (by the habitual operator) and the lack of the Activity presupposition of the Czech Imperfective morphology.[23]

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[22]Any habitual operator that iterates events in a non-overlapping fashion would work as well.

[23]An alternative would be to posit a silent modal operator. Such an operator could introduce the boundedness properties as well (see Bhatt 1999; Hacquard 2006; Mari and Martin 2008, among others, for a related discussion). The disadvantage of this alternative is that one would still need to restrict the operator to Slavic.

The reasoning goes as follows. If the speaker uses the Imperfective morphology felicitously, the speaker were not in a position to presuppose the Activity presupposition. This follows from the Maximize Presupposition principle. If the speaker were in a position to presuppose the Activity presupposition, she would have to use the Perfective morphology. More precisely, given our semantics if the speaker uses the Imperfective morphology, she was not in a position to presuppose the existence of a hiatus. One might ask why the hiatus cannot be accommodated. To see this, let us look at the reasoning components, namely, assertion, entailment and presupposition:

(34) a. Assertion: There exists a hiatus between two distinct time intervals
          ($\exists t' \exists t'' \exists t''' (t' < t''' < t'' \vee t' > t''' > t'' \wedge \neg V(x)$ at $t''') \wedge V(t') \wedge V(t''))$
      b. Entailment: If there is a hiatus, there is a time interval preceding the hiatus
      c. Presupposition: none (a hiatus is not presupposed)

By the Gricean reasoning, the hearer concludes that if the speaker were in a position to assert an existence of a hiatus and yet did not see herself in a position to presuppose the hiatus, then it follows that the speaker didn't believe that she was in a position to presuppose the hiatus:

(35) a. Assertion: There exists a hiatus between two distinct time intervals
          ($\exists t' \exists t'' \exists t''' (t' < t''' < t'' \vee t' > t''' > t'' \wedge \neg V(x)$ at $t''') \wedge V(t') \wedge V(t''))$
      b. Entailment: If there is a hiatus, there are two time intervals surrounding the hiatus
      c. Presupposition: $\neg Believe(hiatus)$

By the epistemic step it follows that the speaker believed that the hiatus may not be presupposed (or accommodated) (cf. Chemla 2008):

(36) a. Assertion: There exists a hiatus between two distinct time intervals
          ($\exists t' \exists t'' \exists t''' (t' < t''' < t'' \vee t' > t''' > t'' \wedge \neg V(x)$ at $t''') \wedge V(t') \wedge V(t''))$
      b. Entailment: If there is a hiatus, there are two time intervals surrounding the hiatus
      c. Presupposition: $Believe \neg (hiatus)$

Since the hiatus is asserted but it cannot be presupposed for the actual world, it follows that there is exactly one verifying instance required by the assertion of the hiatus. The process of pluralization of the event is not presupposed in the actual world and consequently is free to shift to possible worlds.[24] As a results, the hearer is free to interpret the pluralization of events as pluralization in possible worlds as long as there is one instance of the hiatus in the actual world.

Romance is different in that the relevant presupposition is not present in the Romance Imperfective morphology. Consequently, the speaker is free to accommodate the presupposition of the hiatus. Since the hiatus can always be accommodated, there is no need to shift the hiatus to possible worlds. We argue that the shift to possible worlds is not only unnecessary, in fact it is impossible. We assume this restriction follows from economy of interpretation which allows additional LF operations only if the relevant semantic interpretation is not available otherwise (Fox, 1995, 2000; Reinhart, 1995, 2006). Consequently, if the presupposition of the hiatus cannot be shifted to possible worlds, a regular habitual reading becomes obligatory.

So far we concentrated only on morphologically simplex Imperfective verbs. Interestingly, morphologically complex Imperfective verbs in Czech may be formed by prefixes whose lexical entry carries the Activity presupposition. The current proposal makes the following prediction. If such an Imperfective verb is modified by an *in*-adverbial, the competition with the Perfective morphology is not relevant anymore and consequently we expect to get the Romance type of habitual reading. This prediction is indeed borne out as can be seen in (37).

(37)   Petr (*jednou) rozmalovával   pokoje za
            Petr once   finished-the-first-phase-of-painting.Imperf rooms in
            hodinu.
            hour
            'Petr used to finish the first part of painting rooms (for example, the first coat) in an hour.'

To conclude, the presented case study makes two theoretical points. First, we argued that in order to understand Aspectual semantics and the morphology-semantics mapping in the Aspectual domain, we must take into account the presuppositional content of the Aspectual morphology. For instance, the denotation of Perfective and Imperfective in Slavic and Romance languages may be identical but the usage of the Aspectual morphology differs because of distinct presuppo-

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[24]Note that the reasoning is reminiscent of counterfactuals.

sitions associated with the morphology in different languages. Even though we differ in the actual implementation, a similar point has been made, for example, by Grønn (2005) and Tatevosov (2011).

Second, as the obligatory status of the bounded ability reading in Czech shows, there are systematic repairs strategies that may both resolve compositional conflicts by inserting a free type-shifting operator and by shifting the interpretation to possible worlds. Even though more work needs to be done to fully understand the cross-linguistic differences in the Aspectual domain, we believe our study supports the view of the grammar as having a competition component at least at the LF branch of the derivation.

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