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IF YOU CAN SHOW THE FUTURE, I KNOW WHAT YOU ARE MADE OF: ASPECT + MODAL-TEMPORAL DOMAIN IN SERBIAN

Abstract
This paper illustrates restrictions on perfective forms under future interpretation in Serbian. It is argued that such restrictions can be captured under an account based on the syntax-semantics interplay. Regarding semantics, the restrictions arise when the reference time interval is very short (Todorović 2015, 2016). Such an analysis predicts the perfective to be restricted with semantic present, but not in past and future contexts. Interestingly, future interpretation in Serbian can, a.o., be obtained with morphological present – in some of those cases, the perfective is felicitous. It is argued that, in those instances, possibility of the perfective is an indication that the structure contains a covert modal/future component which provides the longer reference time interval needed for the perfective to be felicitous. Regarding syntax, it is proposed that this covert future component requires syntactic licensing. Thus, (im)possibility of the perfective reflects the presence/absence of a covert modal/future element in the structure. More generally, it indicates the composition of the temporal-modal clausal domain.

Keywords
perfective aspect; tense; future; modals; Serbian

1. The perfective and future interpretation in Serbian

1.1 Matrix clauses
In matrix clauses in Serbian, future interpretation is typically obtained via auxiliary hteti ‘will’ (inflected for number and person) and an infinitive. In terms of aspect, both perfective and imperfective are allowed:
Another way to express future is with morphological present. Crucially, the form is compatible only with the imperfective ((2a) vs. (2b)).

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Interestingly, morphological present can also denote future with hteti ‘will’ and element da, in which case both aspects are available, as in (3). The perfective under the future interpretation is thus permitted in the presence of ‘will’.

1.2 Embedded clauses

Embedded clauses in Serbian are typically expressed with an element da and morphological present. I focus on the aspectual distribution in three types of complements.

In future-irrealis complements, e.g. complements of želeti ‘to want’, the embedded present receives future interpretation; both aspects are available:

In propositional complements, e.g. complements of verovati ‘to believe’, future interpretation of the embedded present is available only with the imperfective, but not with the perfective, as in (5). Note a more general restriction with the embedded present in these complements: eventive predicates cannot co-occur with the perfective under a simultaneous interpretation, as in (6).
If You Can Show the Future, I Know What You Are Made of: Aspect + Modal-Temporal Domain in Serbian

   believe3sg.pres da Jovan tomorrow buy3sg.pres house
   ‘(S)he believes that John will be buying a house tomorrow.’

   believe3sg.pres da Jovan tomorrow buypf3sg.pres house
   ‘(S)he believes that John will have bought a house tomorrow.’

   believe3sg.pres da Jovan translateimperf3sg.pres poem
   ‘(S)he believes that John is translating a poem (right now).’

   believe3sg.pres da Jovan translatepf3sg.pres poem
   Intended: ‘(S)he believes that John has translated a poem (just now).’

In tenseless complements, e.g. complements of pokušavati ‘to try’, embedded present occurs with either aspect, as in (7). However, the future interpretation is altogether excluded (8). A summary of the aspectual restrictions is given in table 1.

(7) Pokušava da prevodi / prevede pesmu.
   try3sg.pres da translateimperf3sg.pres / translatepf3sg.pres poem
   ‘(S)he is trying to translate a poem right now.’ (imperf.)
   ‘(S)he is trying to translate the entire poem. (pf.)

(8) *Pokušava da sutra prevodi / prevede pesmu.
   try3sg.pres da tomorrow translateimperf3sg.pres / translatepf3sg.pres poem
   ‘(S)he is trying to translate a poem tomorrow.’ (imperf.)
   ‘(S)he is trying to translate the entire poem tomorrow.’ (pf.)

Tab. 1 Distribution of the perfective in Serbian

<table>
<thead>
<tr>
<th>Environment</th>
<th>Perfective under future reading</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Matrix clauses</strong></td>
<td></td>
</tr>
<tr>
<td>will + infinitive</td>
<td>✓</td>
</tr>
<tr>
<td>morph. present</td>
<td>*</td>
</tr>
<tr>
<td>will+ da+ morph. present</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Embedded clauses</strong></td>
<td></td>
</tr>
<tr>
<td>Future-irrealis</td>
<td>✓</td>
</tr>
<tr>
<td>Propositional</td>
<td>*</td>
</tr>
<tr>
<td>Tenseless</td>
<td>*</td>
</tr>
</tbody>
</table>

1 Note that present with the perfective in matrix clauses is also ungrammatical with episodic predicates under the Utterance Time interpretation. Perfective is, however, possible in certain generic/habitual contexts; e.g., he reads a book every year or he claimed to read a book whenever... See section 3.1.
Despite the apparent unsystematicity, I argue that the patterns in table 1 are captured under the analysis which resorts to both semantics and syntax. Regarding semantics, I propose that the perfective is banned when the reference time interval with respect to which the event is ordered is too short (Todorović 2015, 2016). As it will be shown, such an analysis predicts the perfective to be disallowed with semantic present, but not in past and future contexts. Interestingly, in addition to the canonical forms, it was shown that future interpretation in Serbian can be obtained with morphological present. When perfective is felicitous, I argue that the structure contains a covert modal/future component which provides a longer reference time interval needed for the perfective to be acceptable (e.g. (3)); when this component is not present, the perfective is infelicitous (e.g. (2b)). This component, I argue, needs to be syntactically licensed. Thus, the distribution of the perfective actually indicates the presence/absence of a covert modal/future element in the structure, or, more generally, it reflects the composition of the temporal-modal clausal domain.

The discussion starts with clausal complements. In section 2, I lay out the differences in their structure in Serbian; in section 3, I argue that, by deriving the temporal ordering compositionally, we see that the different constellations of these complements affect the availability of the perfective. Section 4 extends the analysis to matrix clauses. Section 5 tackles imperfectives. Section 6 concludes the paper.

2. Architecture of embedded clauses

Based on syntactic and semantic properties, Wurmbrand (2001 et seq.) claims that English infinitival complements in (9) are not equally transparent, involving domains of different sizes (à la Grohmann 2003). In particular, propositional infinitives involve a thematic (Θ), inflectional (Φ) and operator (Ω) domain, as in (10). Future-irrealis infinitives and tenseless infinitives, however, are subject to size-restructuring i.e. non-projection of Φ and/or Ω domains (provided their content can be recovered); tenseless project only Θ domain, and future-irrealis infinitives project Θ and Φ domain.

(9)  
a. Leo claimed to be eating (*tomorrow). propositional, simultaneous  
b. Leo decided/planned/promised to eat (tomorrow). irrealis, future  
c. Leo tried/began/managed/forgot to eat (*tomorrow). tenseless
Regarding Serbian counterparts of (9), they can be expressed via (morphologically) finite clauses:

(11) a. Jovan je tvrdio da čita / *pročita knjigu. propositional
Jovanis claimed DA read/ *read book
‘Jovan claimed to be reading the book.’ (impf.)
‘Jovan claimed to have finished reading the book (right then).’ (pf.)
b. Jovan je odlučio da čita / pročita knjigu. future-irrealis
Jovan is decided DA read / read book
‘Jovan decided to read the (entire) book.’
c. Jovan je pokušao da čita / pročita knjigu. tenseless
Jovan is tried DA read / read book
‘Jovan tried to read the (entire) book.’

Todorović – Wurmbrand (2015, to appear) (T&W) argue that traditional view that: a) associates finiteness with Tense and b) encodes it in the C-domain (e.g., Rizzi’s 1997 FinP) is problematic for languages without (or with fewer) infinitives. This is because embedded finite CPs are argued to be less transparent than non-finite complements, which are porous for various properties. However, Serbian complements, although finite, show striking syntactic and semantic similarities to non-finite clausal complements in e.g. English, Italian, Czech (e.g. clitic climbing). T&W argue that properties such as the availabilities of infinitives, clitic climbing, adverb placement, to name a few, are captured if these complements in Serbian are also of different sizes:

2 In their approach, da, which occurs only in finite complements, is a marker of finiteness. They propose that it is realized in a Ω-/Φ-/Θ-domain when finiteness is not overtly marked in that domain (e.g. will and do not overtly mark it, but Tense does). For details and a full list of properties, see T&W.
Focusing on the aspectual restrictions in these complements, I propose that the configurations in (12) are responsible for the distribution, as discussed in section 3.

3. Aspect and the structure of the temporal-modal domain

3.1. Propositional complements

In order to capture the distributions from table 1, consider first aspectual restrictions in finite environments with episodic readings in certain temporal configurations. The perfective is not permitted in matrix clauses (13a) and propositional complements (13b), while being allowed in future-irrealis (13c) and tenseless complements (13d).

(13) a.  
Milan prevodi / *prevede pesmu.
Milan translate / translate poem
‘Milan is translating a poem.’/ ‘Milan has translated a poem (just now).’

b.  
Veruje da Jovan prevodi / *prevede pesmu.
believes DA Jovan translate / translate poem
‘(S)he believes that John is translating a poem (right now).’ (impf.)
Intended: ‘(S)he believes that John has translated a poem (just now).’ (pf.)

c.  
Odlučila je da sutra prevodi / prevede pesmu.
decided is DA tomorrow translate / translate poem
‘She decided to be translating a poem tomorrow.’ (impf.)
‘She decided to translate the (entire) poem tomorrow.’ (pf.)

d.  
Pokušala je juče da prevodi / prevede pesmu.
tried is yesterday DA translate / translate poem
‘She tried to be translating a poem yesterday.’ (impf.)
‘She tried to translate the (entire) poem yesterday.’ (pf.)
Todorović (2015, 2016) argues that the restrictions in (13) follow from the incom-patibility of perfective aspect and the temporal domain above it. She adopts von Stechow’s (1999) proposal that both Tense and Aspect are involved in the temporal ordering of the event time interval (the ET) with respect to the reference time interval (the RT), i.e., a time interval with respect to which the ET needs to be located (see also Klein 1994, i.a.). The RT is the Utterance Time (the UT), a near-instantaneous interval (cf. Giorgi – Pianesi 1997, i.a.), unless contextually specified otherwise; it is structurally represented in SpecTP.

(14)

Temporal ordering is captured by a compositional analysis, the computation pro-ceeding in step-by-step fashion. In (14), both Tense and Aspect are ordered with re-spect to the RT, i.e. the UT. However, for Aspect and hierarchically lower elements, this is an indirect relation. All relations are strictly local – each temporal head es-tablishes a relation with its sister: Tense in T establishes a direct relation with the RT (the UT), and then the Aspect is ordered with respect to the time interval that T establishes in its interaction with the RT. In that sense, Aspect is also ordered with respect to the RT, but this ordering is indirect, mediated via Tense.

Consider the perfective in matrix clauses. Assuming (15a), it requires the ET to be included in the RT, i.e. the UT. However, the perfective is only indirectly ordered with respect to the UT, unlike Tense. If Tense, which is directly ordered with respect to the UT, is specified for present, then, according to (16), it introduces an ordering interval for Aspect equal to the UT. Given (15a), the requirements of the perfective cannot be met, i.e. the interval is too short, and the perfective is correctly ruled out.

(15) a. Perfective: $\lambda P.\lambda t.\lambda w.\exists e [\text{time}(e) \subseteq t \& P(w)(e)]$  
   b. Imperfective: $\lambda P.\lambda t.\lambda w.\exists e [\text{time}(e) \subseteq t \& P(w)(e)]$

(16) $[\text{PRESENT}] = \lambda p.\lambda t.\lambda w.\exists t_1 [t_1 = t \& P(t_1)]$
   (à la Pancheva – von Stechow 2004)

The same applies to propositional complements: present tense yields a context in which the embedded RT for the perfective, the attitude holder’s ‘now’, as in (17), is

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3 For English, see e.g. Smith (1991), among many others.
very short. Since the requirements of the perfective are not met, it is ruled out in simultaneous contexts with these complements (cf. (6b)).

This further implies that, in the presence of a longer time interval which serves as a mediator between Aspect and the RT, the requirements of the perfective can be met. Such intervals are introduced in past and future contexts; the perfective is ruled in.

(18) \[ \text{past/future/perfect} \quad [\sqrt{\text{perfective}}/\sqrt{\text{imperfective}}] \text{ (simplified)} \]

Importantly, I argue that such a compositional analysis can also capture the (un)availability of the perfective shown in table 1. Future-irrealis and tenseless complements are discussed in section 3.2, and matrix contexts are discussed in section 4.

3.2 Irrealis future complements

Certain matrix verbs require an embedded future interpretation, as in (19) for Serbian. T&W propose that, due to their mandatory future interpretation, these complements contain a modal woll component (woll) (to be specified immediately).

   'Jovan decided to have slept in the garage.'

b. Jovan je rešio da spava impf.3sg.pres u garaži.
   'Jovan decided to sleep in the garage.'

I leave aside the discussion of forms containing past and perfect components in Serbian (see Todorović 2015 for details). Note that the basic idea remains: the perfective is felicitous when it is directly ordered with respect to a longer time interval, introduced by e.g. Perfect. Interestingly, when these intervals are reduced to a short interval, e.g. 'at 4.30 p.m.', the perfective is again banned. Conversely, the perfective with semantic present tense is felicitous with, e.g. quantifiers; they quantify over time intervals, extending the RT for the perfective. Both outcomes are predicted by the analysis.
woll has independently been argued to be present in the structure of finite future, where it is licensed by semantic tense, present or past (Abusch 1985 et seq., Condoravdi 2002, Copley 2002, i.a.). Another licensor is an irrealis element (cf. section 3.2.1). Assuming that licensing occurs via feature valuation, tense or irrealis element values the relevant feature on the Modal head:

(20)
\[
\begin{align*}
\text{Spell-out (1/2/3 sg., 1/2/3 pl.):} \\
\text{pres + woll →ću, ćes, će, ćemo, ćete, će} \\
\text{past + woll →ću, ćes, će, ćemo, ćete, će}
\end{align*}
\]

Regarding (19), verbs which semantically select a future-oriented complement can be assumed to have an irrealis feature which must match with an irrealis/future complement. Assuming selection is local, the matrix verb must combine with the projection hosting the relevant future element, as in (21). In other words, future complements lack the Ω-domain (see also Progovac 1993 et seq., Stjepanović 2004, T&W).

(21) Future complement

[For a CP-less structure, but different motivation
see also Bošković (1997)]

Importantly, the structure in (21) also captures the availability of the perfective in these complements. I propose that woll, as in (22), quantifies over possible world-time pairs (cf. Abusch 1985, et seq., i.a.), extends the RT and allows the inclusion of the ET into the RT – the perfective is allowed.

(22) \[
\left[\text{WOLL}\right]_{\text{MB}} = \lambda P. \lambda w. \lambda t. \forall w' [w' \in \text{MB} (w,t) \rightarrow ([t,\_), w', P)]
\]

(Condoravdi 2002)

Regarding the future flavor of woll, it is due to the quantification over possible future world-time pairs. This is also how the perfective gets this flavor – it would
otherwise be difficult to achieve futurity, since the semantics of the perfective does not contribute it, but requires the component that would open up the future for it.5

3.2.1 woll licensors

Assuming that covert elements require licensing, it was shown how woll can be licensed by tense or future selecting verbs. Other licensing environments include exclamatives/wishes (23), questions (24), and antecedents of conditionals (25).

(23) Da ti se sve želje ostvare!  
Da you hat se all wishes come.true  
‘May all your wishes come true!’

(24) a. Da Vesna pročita ovu knjigu?  
Da Vesna read this book  
‘Should Vesna read this book?’ (Vrzić 1996, 292)

b. Koju knjigu da Vesna pročita?  
which book da Vesna read  

(25) Ako kupi kuću sutra, na konju je!  
if buy house tomorrow on horse is  
‘If/when (s)he buys a house tomorrow, (s)he’s good!’

Regarding questions, it has independently been proposed that interrogative C has irrealis feature (Givón 1995, 119, i.a.), which can then license this feature on woll:

(26) a. $\Omega_{wh}$  
wh-XP/Q/C $\Phi$  
woll, F: irr  
$\Omega_{dec}$  
C $\Phi$  
Mod  
woll, *F: ___  
*da li da  

5 With these verbs, it is tempting to say that the future flavor of the complement stems from the irrealis feature of the root verb and not from woll. Consider, however, the following scenario: On Friday, Jovan told Marija that he loved her. She did not admit that she felt the same, but she decided to do it when she meets him next time. One can say:

(i) Marija je odlučila da, kada ga opet vidi, kaže Jovanu istinu.  
Marija is decided da when him see again say Jovan acc truth  
‘Marija decided to tell Jovan the truth when she sees him again.’

In (i), the embedded event is future-oriented with respect to the meeting, and not to the matrix event, thus, the complement’s future flavor can stem from woll. I leave the analysis for further research.
Interestingly, declaratives do not license WOLL (26b); they require an overt modal:

(27) a. *Da Vesna pročita ovu knjigu.
   Da Vesna read_PRES this book
   ‘Vesna should read this book.’ (Vrzić 1996, 292)

   b. Vesna treba pročitati ovu knjigu.
   Vesna should read_PRES this book
   ‘Vesna should read this book.’ (Vrzić 1996, 292)

Importantly, in (23)–(27), the perfective is felicitous under future reading. I propose that this is due to the presence of WOLL, which provides the needed extension of the RT (and the future flavor), but which is independently syntactically licensed.

3.3 Propositional complements: future interpretation

Propositional complements do not per se contain WOLL, which explains why the perfective is disallowed with present tense – under the simultaneous (6) or future interpretation (5), RT for the perfective cannot be extended. But nothing in principle prevents them from containing WOLL. When it is in the structure, it is realized as hteti ‘will’. In those cases, perfective is felicitous, as predicted:

(28) Veruje da će Jovan sutra kupovati / kupiti kuću.
   believes DA will Jovan tomorrow buy/PRES / buy_PRES house
   ‘(S)he believes that John will be buying a house tomorrow.’ (impf.)
   ‘(S)he believes that John will have bought a house tomorrow.’ (pf.)

3.4 Tenseless complements

Based on the availability of Long Object Movement and adverb placement, T&W propose that complements of verbs like try in Serbian project only the Θ-domain:

(29)

The reduced structure in (29) can capture the lack of future-oriented interpretation of these complements: WOLL in (30) (cf. (8)) is excluded since try does not select it.
(30) *Pokušava da sutra prevodi / prevede pesmu. 
tries DA tomorrow translate\textsubscript{IMPF,3SG,PRET} / translate\textsubscript{PF,3SG,PRET} poem 
‘(S)he is trying to translate a poem tomorrow.’ (imperf.) 
‘(S)he is trying to translate the entire poem tomorrow.’ (pf.)

Note a potential problem: perfective is possible in a simultaneous \textit{try} complement, even though the matrix tense is present, hence the RT for the perfective is short:

(31) Pokušava da prevodi / prevede pesmu. 
try\textsubscript{3SG,PRET} DA translate\textsubscript{IMPF,3SG,PRET} / translate\textsubscript{PF,3SG,PRET} poem 
‘(S)he is trying to translate a poem right now.’ (imperf.) 
‘(S)he is trying to translate the entire poem. (pf.)

A possible solution is along the lines of Sharvit (2003), who proposes that \textit{try} includes the extensional and the intensional component, the latter carrying a presupposition that the event is unrealized at the time of trying, but it continues as part of subject’s beliefs. This continuation can then provide the needed extension for the perfective, capturing (31). Finally, unlike in future-irrealis complements, eventives embedded under \textit{try} need to be ongoing at the time of trying, ruling out (30).

4. Matrix clauses

Regarding matrix clauses, I argue that they are also captured by the proposed analysis. Consider matrix clauses with \textit{da} (cf. (3)). \textit{Da} can occur in the Θ-domain (cf. section 3.4), and it is in principle combinable with a modal component, as in (32). This further predicts that when there is \textit{woll} in matrix clauses, the ban on the perfective should not exist. This is borne out, as in (33):

(32)

(33) On će sutra da kupuje / kupi kola. 
he will tomorrow DA buy\textsubscript{IMPF,3SG,PRET} / buy\textsubscript{PF,3SG,PRET} car 
‘He will be buying a car tomorrow.’ (imperf.) 
‘He will buy a car tomorrow.’ (pf.)
With canonical future forms (cf. (1)), presence of an overt modal component explains the availability of either aspect:

(34) a. \( \text{Ja ću pisa} \ _{\text{IMPF.INT}} \ _{\text{tezu.}} \)
    I will \( \text{write} \)
    ‘I will be writing my thesis.’

b. \( \text{Ja ću u nekom trenu napisati tezu.} \)
    I will \( \text{in some moment write}_{\text{PF.INF}} \) thesis.
    ‘I will have finished my thesis by some point.’

Finally, the ungrammaticality of the perfective in (35) (cf. (2)), is captured by the lack of woll. Importantly, the adverbial is not enough to license the future reading.

(35) \( *\text{Kupim kuću sutra.} \)
    buy \( _{\text{PF.1SG.PRES}} \) house tomorrow
    ‘I will buy a house tomorrow.’

### 5. Imperfective and the modal component

A potential problem for the proposed analysis is the availability of the imperfective:

(36) \( \text{Kupujem kuću sutra.} \) (cf. (2a))
    buy \( _{\text{IMPF.1SG.PRES}} \) house tomorrow
    ‘I am buying a house tomorrow.’

A possible solution lies in the similarities between Serbian and English. In particular, given that Serbian imperfective is to some extent similar to English progressive (cf. Todorović 2015, 2016 for evidence from VP-ellipsis and temporal interpretation), then it might contain a modal, in addition to a temporal component, quantifying over possible continuations, and licensing its future interpretation (cf. Dowty 1979, Landman 1992). This would then capture the contrast between (35) and (36), as well as the availability of future reading of imperfectives in propositional complements:

(37) \( \text{Veruje da Jovan sutra kupuje kuću.} \)
    believe \( _{\text{3SG.PRES}} \) DA Jovan tomorrow buy \( _{\text{IMPF.3SG.PRES}} \) house
    ‘(S)he believes that John will be buying a house tomorrow.’
6. Conclusion

This paper showed restrictions on the perfective under future interpretation. It was argued that the apparent unsystematicity in its distribution receives a systematic explanation under the analysis which resorts to the incompatibility of lengthy events and short RT. When the perfective is available in future contexts, this indicates that there is a covert modal/future component in the structure allowing for the extension of the RT. This covert modal element, however, needs to be independently syntactically licensed. The licensing thus does not refer to perfective aspect; rather, (im)possibility of the perfective indicates the presence/absence of a covert modal/future element. More generally, it reveals the composition of the higher, modal-temporal domain.

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