

# The symmetric syntax of Japanese complex verbs and Slavic prefixes\*

Yoshio Endo  
endoling@gmail.com

Bartosz Wiland  
bartek@wa.amu.edu.pl

December 2012

## 1. Introduction

We report on a robust symmetry between the Polish and the Japanese sequence of syntactic projections in what superficially looks like different domains, namely verbal prefixes (Polish) and multiple verbs (Japanese). This parallelism strongly supports the thesis about the fine-grained sequence of positions in syntax, namely that there exists the functional sequence of syntactic heads (fseq) which is invariantly ordered by UG (see e.g. Cinque (1999)) and the surface differences among particular languages in the order of elements that instantiate this fseq result solely from movement (not from the variation in fseq itself).

We demonstrate this thesis on the example of the sequence of syntactic heads behind the multiple verbal prefixes in Polish and the multiple verb system in Japanese. This surprising *tertium comparationis* instantiates the same subset of fseq, as exemplified by the order of the distributive and saturative prefix in (1) and the distributive and saturative verbs in (2).<sup>1</sup>

(1) DIST *po* > SAT *na* (Polish)

- a. *po-na-jadać się owoców*  
DIST-SAT-eat self fruits  
'to eat some fresh fruits (to the point of satisfaction)'
- b. \**na-po-jadać się*  
SAT-DIST-eat self

(2) DIST *nare* < SAT *makur* (Japanese)

- a. *Merii-ga posutaa-o hari-makuri-nare-tei-ru.*  
Mary-NOM poster-ACC paste-roll.up-get.used.to-ASP-PRES  
'I is used to pasting up posters to the point that there is no poster left'
- b. \**Merii-ga posutaa-o hari-nare-maku(r)-tei-ru.*  
Mary-NOM poster-ACC paste-get.used.to-roll.up-ASP-PRES

We show that the surface sequence of Japanese multiple verbs turns out to constitute a mirror-image of the sequence of multiple verbal prefixes in Polish. Given the roll-up movement of the Japanese clause and the lack of the roll-up in the respective area of the clause in Polish, the base-generation of Polish prefixes and Japanese multiple verbs instantiate the same fine-grained fseq (with primitives such as 'distributive', 'saturative', 'excessive', etc. heading their own projections in the syntax of both Polish and Japanese).

We begin with the presentation of the multiple prefixation facts in Polish from Wiland (2012), which sets up the context for our investigation of the Japanese data. Next, we discuss

---

\* Thanks to Guglielmo Cinque for comments on an earlier draft. Parts of this work were presented at Potsdam University in June 2012, EGG summer school in Wrocław in July 2012 and BCGL-7 in Brussels in December 2012. We are indebted to the audiences there for feedback. Needless to say, all errors are our own responsibility.

<sup>1</sup> We adopt the following abbreviations: ATT - attenuative, COMPL - completive, CUMUL - cumulative, DELIM - delimitative, DIST - distributive, EXC - excessive, PERD - perdurative, REP - repetitive, SAT - saturative, TERM - terminative

Japanese complex verbs and compare their ordering with the Polish facts showing that they instantiate the same fseq.

## 2. Functional sequence of Polish verbal prefixes

There is a considerable consensus in the literature on Slavic prefixes that they form two heterogeneous classes w.r.t. their syntactic (and also semantic) properties: the superlexical (or vP-external) prefixes, which contribute aspectual meanings, and the lexical (or vP-internal) prefixes, which participate in the argument structure of the predicate (see Ramchand (2004), Romanova (2004), Svenonius (2004b), DiSciullo and Slabakova (2005), among others).

Polish allows for multiple verbal prefixes. Wiland (2012) argues that the vP-external prefixes<sup>2</sup> in Polish lexicalize the articulate sequence of aspectual heads generated on top of the vP:<sup>3</sup>

(3) ... [ Dist<sup>0</sup> [ Att<sup>0</sup> [ Delim<sup>0</sup> [ Cuml<sup>0</sup> [ Sat<sup>0</sup> [ Perd<sup>0</sup> [ Exc<sup>0</sup> [ Rep<sup>0</sup> [ Compl<sup>0</sup>/Term<sup>0</sup> [ v<sup>0</sup> [ ...

As such, prefixes are literally pieces of a syntactic tree in a zone above the vP. In this way, primitive aspectual notions such as 'distributivity', 'saturation', or 'repetition' that Polish (and more generally Slavic, see Svenonius (2004a)) verbal prefixes denote are heads of syntactic projections just like features such as 'tense', 'interrogative', 'focus', 'cause', etc. are heads of syntactic projections.

As far as multiple prefixation is concerned, it is argued in Wiland (2012) that this sequence explains, among others, why out of very many stacking possibilities only some are well-formed, as for instance in the examples in (4)-(7):

- (4) a. po-prze-bijać oferty  
DIST-EXC-hit offers  
'to make better offers (several times)'  
b. \*prze-po-bijać  
EXC-DIST-hit
- (5) a. na-do-krajać chleba  
SAT-COMPL-cut bread  
'to slice even more bread'  
b. \*do-na-krajać  
COMPL-SAT-cut
- (6) a. po-prze-pisywać  
DELIM-REP-write  
're-write something (a little bit)'  
b. \*prze-po-pisywać  
REP-DELIM-write

<sup>2</sup> In this paper, we are interested only in the account of the superlexical/vP-external prefixes and will not adopt or make any claims about the class of lexical/vP-internal prefixes.

<sup>3</sup> The immediately pre-verbal head position is indicated in (3) as Compl<sup>0</sup>/Term<sup>0</sup> since, as noted in Wiland (2012), the data analyzed there is insufficient to determine their ordering with respect to each other. While it is made clear in Wiland (2012) that both completive *do-* (as in *do-kończyć* 'to finish') and terminative *od-* (as in *odrobić* 'do e.g. the homework') both come at the very bottom of the sequence which is spelled-out as aspectual prefixes, their mutual ordering remains indeterminate since they never appear together. (This fact may actually suggest that they compete for the same position in the sequence). The exact ordering of Compl<sup>0</sup>(etive) and Term<sup>0</sup>(inative) with respect to each other is not essential to what follows.

- (7) a. na-prze-siadywać się  
DIST-PERD-sit self  
'to sit for a long time (in some places on numerous occasions, e.g. in pubs)'  
b. \*prze-na-siadywać się  
PERD-DIST-sit self

A generalization about Polish aspectual prefixes is that given any two vP-external prefixes that can stack in the order X>Y, the reversed order Y>X is ill-formed, without exception. As argued in Wiland (2012), only multiple prefixation patterns that observe the fseq in (3) are well-formed. To illustrate this, consider for instance the distributive prefix *po-*, which is able to stack on top of attenuative *pod-* (in (8)), saturative *na-* (in (9)), cumulative *na-* (in (10)), excessive *prze-* (in (10)), repetitive *prze-* (in (11)), perdurative *prze-* (in (12)), or completive *do-* (in (13)), while all reverse orders are strongly ill-formed, as in the (b) examples:

- (8) DIST *po* > ATT *pod*  
a. po-pod-duszać (mięso w garnku)  
DIST-ATT-stew (meat in pot)  
'to stew meat in a pot a little bit'  
b. \*pod-po-duszać  
ATT-DIST-stew
- (9) DIST *po* > SAT *na*  
a. po-na-jadać się owoców  
DIST-SAT-eat self fruits  
'to eat some fresh fruits (to the point of satisfaction)'  
b. \*na-po-jadać się  
SAT-DIST-eat self
- (10) DIST *po* > EXC *prze*  
a. po-prze-krzykiwać innych  
DIST-EXC-shout others  
'to shout louder than others'  
b. \*prze-po-krzykiwać  
EXC-DIST-shout
- (11) DIST *po* > REP *prze*  
a. po-prze-pisywać nuty na pięciolinie  
DIST-REP-write tunes onto stave  
'to re-write tunes onto a stave'  
b. \*prze-po-pisywać nuty  
REP-DIST-write tunes
- (12) DIST *po* > PERD *prze*  
a. po-prze-siadywać w knajpach całe dni  
DIST-PERD-sit in pubs all days  
'to spend all days in pubs'  
b. \*prze-po-siadywać  
PERD-DIST-sit

- (13) DIST *po* > COMPL *do*
- a. po-do-kańczaj swoje zadania  
DIST-COMPL-finish your assignments  
'finish your assignments'
  - b. \*do-po-kańczaj  
COMPL-DIST-finish

This pattern holds not only with distributive *po*- but with other prefixes, thus, for instance, cumulative *na*- is able to stack on top of perdurative *prze*- (in (14)) or terminative *od*- (in (15)), but the reverse orders are ill-formed:

- (14) CUMML *na* > PERD *prze*
- a. na-prze-pisywać się listów  
CUMML-PERD-write self letters  
'to re-write letters (in bulk, for a long time)'
  - b. \*prze-na-pisywać się  
PERD-CUMML-write self

- (15) CUMML *na* > TERM *od*
- a. na-od-rabiać się zadań domowych  
CUMML-TERM-do self homework assignments  
'to do a lot of homework assignments'
  - b. \*od-na-rabiać się  
TERM-CUMML-do self

It must be noted that the fseq in (3) does not simply model the multiple prefixation facts. Instead, it explains a constraint on stacking syncretic super-lexical prefixes in Polish, namely that syncretic prefixes *na*- and *prze*- do not stack, except the syncretic prefix *po*-. That is, *na*-, which is syncretic for cumulative and saturative, can stack with other prefixes (as in (16)) but not with one another (as in (17)).

- (16) a. po-na-krajać  
DIST-CUMML-cut  
'to cut extensively'
- b. po-na-pijać się  
DIST-SAT-drink self  
'to drink to the full'

- (17) a. \*na-na-krajać  
b. \*na-na-pijać się

Similarly, *prze*-, which is syncretic for repetitive, excessive and perdurative, can stack with other prefixes (as in (18)) but not with one another (as in (19)).

- (18) a. po-prze-rabiać  
DIST-REP-make  
'to remake'
- b. po-prze-krzykiwać  
DIST-EXC-shout  
'to outshout'

- c. na-prze-siadywać  
DIST-PERD-sit  
'to sit for a long time'

- (19) a. \* prze-prze-rabiać  
b. \* prze-prze-krzykiwać  
c. \* prze-prze-siadywać

This situation contrasts with the syncretic distributive and delimitative *po-*, which can be stacked on one another (often, but not exclusively, when the verb stem is preceded by a lexical prefix):

- (20) a. po-po-w-kładać  
DIST-DELIM-in-put  
'to put something in'  
b. po-po-w-nosić  
DIST-DELIM-in-bring  
'to bring something in'  
c. po-po-w-klejać  
DIST-DELIM-in-paste  
'to paste something in'

In Wiland (2012) it is argued that the underspecification approach to prefix syncretism in Polish is challenged by the fact that syncretic prefixes either denote considerable different semantic concepts (visible especially on the example of *prze-*) or different syntactic behavior. The latter is, for instance, the case with syncretic *na-*, where the saturative *na-* (a measure functor which introduces an abundance reading) demands a reflexive clitic, while cumulative *na-* (collectivizing reading) does not:

- (21) Saturative *na-*  
a. Dzieci na-jadły \*(się) makaronu.  
children SAT-eat self pasta  
'Children have eaten up pasta (to the point of complete fullness).'
- b. Kibice po-na-pijali \*(się) piwa.  
fans DIST-SAT-drank self beer.  
'The soccer fans have drunk up beer (to the point of complete satisfaction).'

- (22) Cumulative *na-*<sup>4</sup>  
a. Ich dzieci na-brały (\*się) za dużo rzeczy na wakacje.  
their children CUML-collect self too much things on holidays  
'Their children have taken too many things for holidays.'
- b. Dzieci na-zabierały (się) poziomek w lesie.  
children CUML-pick.up(self) wild strawberries in forest  
'Children have picked up (a lot of) wild strawberries in the forest.'

For these and other reasons, Wiland (2012) argues for the overspecification approach to the prefix syncretism. In such an approach, advanced in Caha's (2009) work on case syncretism,

---

<sup>4</sup> In cases like in (22b) where cumulative *na-* can co-occur with a reflexive clitic, it becomes subject-oriented, very much like saturative *na-* is. Cumulative *na-* without a reflexive clitic is object-oriented.

lexical items are in principle allowed to overspecify (or “span”) over syntactic representations in which each feature heads its own projection. From the investigation of the multiple prefixation facts it turns out that the syncretism of *na-* and *prze-* is restricted to adjacent positions in the resulting fseq in (3) and to non-adjacent positions in the case of syncretic *po-*, as in the lexical specifications given below:

- (23) [Dist<sup>0</sup> [Att<sup>0</sup> [Delim<sup>0</sup> [Cuml<sup>0</sup> [Sat<sup>0</sup> [Perd<sup>0</sup> [Exc<sup>0</sup> [Rep<sup>0</sup> [Compl<sup>0</sup> [Term<sup>0</sup> [...  
           |      |      |          |          |          |          |          |          |          |  
           *po*  *pod*  *po*          *na*                  *prze*                  *do*      *od*

It is then advanced in Wiland (2012) that the lexical specifications as in (23) allow us to explain not only why multiple prefixation is constrained in a particular way but also why syncretic super-lexical prefixes in adjacent positions in such an fseq cannot be stacked, with an exception of the two syncretic *po-*'s, which are non-adjacent in the fseq.

### 3. Japanese complex verbs

With the Polish paradigm of multiple verbal prefixes in mind, this section shows that the surface sequence of Japanese multiple verbs -- which are called V-V compounds in the previous literature -- turns out to constitute a mirror-image of the sequence of multiple verbal prefixes found in Polish.

Since Kageyama's (1989, 1993, 2009) seminal work, Japanese V-V compounds have been studied by many researchers (see Nishiyama (2008) for an overview). Representative examples are as follows:

- (24) a. John-ga  hon-o  yomi-hazime-ta.  
           John-NOM  book-ACC  read-begin-PAST  
           ‘John began to read a book.’  
       b. John-ga  Bill-o  osi-taosi-ta.  
           John-NOM  Bill-ACC  push-topple-PAST  
           ‘John pushed Bill down.’

To the best of our knowledge, the previous literature of the V-V compound concentrates on the cases consisting of two verbal constituents, as illustrated in (17). As is well-known from the previous literature, even the V-V compound consisting of two verbs are constrained in various ways (cf. Kageyama (1993), Matsumoto (1998) and Yumoto (2005)) and it is sometimes a little difficult to find perfectly natural complex verbs. However, it turns out that the second verb of the V-V compounds may be further followed by another V to the effect that the compound comprises three verbs, as illustrated in (26a), and the reversed order of the second verb and the third verb is ill-formed, as shown in (26b) as ordered by the hierarchy in (3). In what follows, we will call the case consisting of three verbs “complex verbs”, instead of V-V-V compounds.<sup>5</sup>

<sup>5</sup> Unlike in the domain of Slavic prefixes, we are providing approximate lexical meanings of constituents inside the Japanese complex verbs denoting more abstract notions such as 'excessive', 'complete', etc., whenever it is possible. For this reason *makas* can be most naturally translated as 'exceed', *ager* as 'complete', etc.

- (25) DIST *nare*<sup>6</sup>  
 a. John-ga uta-o utai-nare-tei-ru.  
 John-NOM song-ACC sing-get.used.to-ASP-PRES  
 ‘John is used to to singing a song.’

EXC *makas*

- b. John-ga Merii-o utai-makasi-tei-ru.  
 John-NOM Mary-ACC sing-exceed -ASP-PRES  
 ‘John is outsinging Mary.’

- (26) DIST *nare* < EXC *makas*

- a. John-ga Merii-o utai-makasi-nare-tei-ru.  
 John-NOM Mary-ACC sing-exceed-get.used.to-ASP-PRES  
 ‘John is used to to outsinging Mary’  
 b. \* John-ga utai-nare-makasi-tei-ru.  
 John-NOM sing-tend-exceed- ASP-PRES

It turns out that, just like Polish prefixes, multiple verb patterns that observe the fseq in (3) are well-formed. To illustrate this point, consider for instance the distributive verb *nare-*, which is able to stack on top of saturative *makur-* (in (27)), cumulative *tamer-* (in (28)), excessive *makas-* (in (29)), repetitive *naos-* (in (30)), or completive *ager-* (in (31)), while all reverse orders are strongly ill-formed, as in the (b) examples below:

- (27) DIST *nare* < SAT *makur*

- a. posutaa-o hari-makuri-nare-tei-ru.  
 poster-ACC paste-roll.up-get.used.to-ASP-PRES  
 ‘I am used to pasting up posters to the point that there is no poster left.’  
 b. \* posutaa-o hari-nare-maku(r) -tei-ru.  
 poster-ACC paste-get.used.to-roll.up-ASP-PRES

- (28) DIST *nare* < CUMUL *tamer*

- a. omoi miuz-o tori-tame-nare-tei-ru.  
 Heavy water-ACC collect-save-get.used.to-ASP-PRES  
 ‘I am used to collecting water.’

---

<sup>6</sup> One may wonder if the second verb *nare* ‘get.used.to’ really heads the verbal complex *utai-nare* ‘sing-get.used.to’. The following facts seem to indicate the headedness of *nare* ‘get.used.to’. The first verb *utai* ‘sing’ is atelic and is, thus, compatible with *for*-adverbials like *3-zikan* ‘for three hours’ as in (ia). In contrast, the second verb *nare* ‘get.used.to’ is telic and is, thus, compatible with *in*-adverbials like *3-zikan-de* ‘in three hours’ as in (ib). With this distinction in mind, consider (ic), where the verbal complex *utai-nare* ‘sing-get.used.to’ is compatible with an *in*-adverbial, not with a *for*-adverbial. This indicates that the right-most verb heads the complex verbal constituent.

- (i) a. John-ga 3-zikan uta-o utat-ta.  
 John-NOM 3-hour song-ACC sing-PAST  
 ‘John sang a song for three hours.’  
 b. John-ga uta-ni nare-ta.  
 John-NOM song-ACC get.used.to-PAST  
 ‘Lit. John get used to a song in three hours.’  
 c. John-ga \*3-zikan/3-zikan-de uta-o utat-nare-ta.  
 John-NOM 3-hour/3hour-in song-ACC sing-get.used.to PAST  
 ‘John sang a song \*for three hours/in three hours.’

- b. \* omoi mizu-o tori-nare-tame-tei-ru.  
heavy water-ACC collect-get.used.to-save-ASP-PRES

(29) DIST *nare* < EXC *makas*

- a. John-o tabe-makasi-nare-tei-ru.  
John-ACC eat-defeat-get.used.to-ASP-PRES  
'I am used to outeating John.'
- b. \* John-o tabe-nare-makasi-tei-ru.  
John-ACC eat-get.used.to-defeat-ASP-PRES

(30) DIST *nare* < SAT *naos*<sup>7</sup>

- a. arubaito-de posutaa-o hari-naosi-nare-tei-ru.  
part.time-as poster-ACC paste-do.again-get.used.to-ASP-PRES  
'I am used to to re-pasting posters as a part-time.'
- b. \* arubaito-de posutaa-o hari-nare-naosi-tei-ru.  
part.time-as poster-ACC paste- tend to re-pasting-ASP-PRES

(31) DIST *nare* < COMPL *ager*

- a. sigoto-de takusanno kimono-o nui-age-nare-tei-ru.  
Job-as many kimono- ACC sew-complete-get.used.to-ASP-PRES  
'I am used to to sewing many kimonoes for my job.'
- b. \* sigoto-de takusanno kimono-o nui-nare-age-tei-ru.  
Job-as many kimono-ACC sew-get.used.to-complete-ASP-PRES

Again, like Polish prefixes, this pattern of complex verbs holds not only with the distributive verb *nare-* we saw immediately above but with other complex verbs, thus, for instance, cumulative *tamer-* is able to stack on top of repetitive *naos-* (in (32)) or completive *ager-* (in (33)) but the reverse orders are ill-formed:

---

<sup>7</sup> As we saw in footnote 6, the right-most verb heads the verbal complex and determines the compatibility in aspect between *for-*adverbials and *in-*adverbials. It is predicted that in the case where a verb is followed by two auxiliary verbs, the second verb determines the compatibility between *for-*adverbials and *in-*adverbials. The prediction is borne out in the case in (30) in an interesting way. Here, the first verb *hari* 'paste' and the second verb *naosi* 'do.again' are ambiguous between *for-*adverbials and *in-*adverbials, as in (ia-b). With the *for-*adverbial *3-zikan* 'for three hour', the sentence in (ia) means that the duration time of John's poster-pasting work continued for three hours. In contrast, with the *in-*adverbial *3-zikan-de* 'in three hour', the sentence in (ib) means that John finished pasting posters in three hours.

- (i) a. John-ga 3-zikan/zikan-de posutaa-o hat-ta  
John- NOM 3-hour/3-hour-in poster-ACC paste-PAST  
'John pasted posters for three hours/in three hours.'
- b. John-ga 3-zikan/zikan-de posutaa-o naosi-ta  
John- NOM 3-hour/3-hour-in poster-ACC do.again-PAST  
'John changed posters for three hours/in three hours.'

Recall from footnote 6 that the third verb *nare* 'get.used.to' is not compatible with *for-*adverbials but with *in-*adverbials. If the right-most verb heads the whole verbal complex and determines the aspectual concord between *for-*adverbials and *in-*adverbials, then it is predicted that the whole verbal complex in (30) *hari-naosi-nare* 'paste-do.again-get.used.to' should only be compatible with the *in-*adverbial *3 zikan-de* 'in three hours', not with the *for-*adverbial *3-zikan* 'for three hours'. The prediction is borne out as in (ii) below:

- (ii) a. 3-zikan-de/\*3-zikan posutaa-o hari-naosi-nare-ta.  
3-hour-in/\*3-hour poster-ACC paste-do.again-get.used.to-PRES  
'I got used to to re-pasting posters in three hours.'



- (32) CUML *tamer* < REP *naos*<sup>8</sup>
- a. kitte-o arubamu-ni hari-naosi-tame-tea-ru.  
stamp-ACC album-DAT paste-do.again-save-ASP-PRES  
'I have re-pasted up stamps to the albums (in bulk).'
- b. \* kitte-o hari-tame-naosi-tea-ru.  
stamp-ACC paste-save-do.again-ASP-PRES
- (33) CUML *tamer* < COMPL *ager*
- a. sokoni takusano kimono-o nui-age-tame-te-arū.  
there many kimono-ACC sew-complete-save-ASP-PRES  
'There are many kimonoes sewed up kimono (in bulk) out there.'
- b. \* sokoni takusano kimono-o nui-tame-age-te-arū.  
there many kimono-ACC sew-complete-save-ASP-PRES

There is a case where the inceptive verb *hazime(r)* appears in the right-periphery in the V-V-V sequence, as illustrated below.

- (34) Sekken-o tukai-oe-hazimeru.  
soap-ACC use-finish-begin  
'I will start to use up soap.'

Here again, the parallelism between Japanese and Polish is robust. The Polish inceptive prefix *za-* is a lexical/VP-internal prefix, hence is not part of the fseq of the superlexical/VP-external prefixes in (3). The fact that in Japanese the inceptive verb *hajimeru* is the right-most element inside the verb may equally suggest that this part of structure does not undergo roll-up, i.e. it is a bottom layer over which all lower nodes move up.

Note that the surface sequence of Japanese multiple verbs, as we suggested above, turns out to constitute a mirror-image of the sequence of multiple verbal prefixes in Polish. In the next section we show that given the roll-up movement of the Japanese clause and the lack thereof in the respective area of the clause in Polish, the base-generation of Polish multiple prefixes and Japanese multiple verbs instantiate the same fine-grained fseq (with primitives such as 'excessive' or 'cumulative', etc. heading their own projections in the syntax of both Polish and Japanese).

#### 4. Surface morpheme order by roll-up in Japanese

In this section we examine how the surface sequence of Japanese multiple verbs constitutes a mirror-image of the sequence of multiple verbal prefixes in Polish. Before going directly into this task, it is useful to notice that clausal functional elements in Japanese mirror the morphological make up of verbs in Polish. To illustrate this point, consider the following example which contains a sequence of particles associated with the verb *narabe* 'arrange' of the form which could appear in a root clause:

- (35) narabe-rare-tei-ta-yooda  
arrange-Passive-Aspect-Tense-Mood  
'(Things) seem to have been arranged.'

---

<sup>8</sup> Some speakers give an opposite judgment of the sentences in (32), which involve the verb *naosi* 'do.again'. More study is required into the nature of this verb.

In (35), the verb stem *narabe* ‘arrange’ is followed by the Passive particle *rare*, which in turn is followed by the Aspect particle *tei*, etc. According to Baker’s (1985) Mirror Principle, this sequencing of the particles can be interpreted in the following way. The verb is merged in a position lower than the Passive particle *rare*, which in turn is merged lower than the Aspect particle *tei*; by transitivity, the verb is merged lower than the Aspect particle. Applying this logic to other particles in (35), the hierarchy of Japanese clausal heads is as follows:

(36) [verb stem]<Voice<Aspect<Tense<Mood

This hierarchical ordering of Japanese clausal functional heads is consistent upon the relative surface order of Polish clausal functional heads, as illustrated by the following example, where the verb stem (made of the root *rob-* ‘do’ and a Theme Vowel *-i-*) is followed by a phonetically null exponent of Active Voice, Past Tense morpheme *-l-*, 3.FEM.SG agreement morpheme *-a-* and the Mood particle *-by* (cf. for instance Jabłońska (2007) on Polish verbs).<sup>9</sup>

(37) *rob-i-ø-l-a-by*  
do-Theme Vowel-Voice-Tense-Agr<sub>3SG.FEM</sub>-Mood  
‘She would do (something).’

Our suggestion is that the surface word order in Japanese is derived by the roll-balling derivation exploited in Cinque (2006), whose insight originates in Aboh (2003). (In fact, Koopman (2005) directly argues for this kind of derivation behind the Japanese morpheme order). To see the basic idea behind the roll-up derivation, consider the following:

(38) a. [A [B [C...]]], where A asymmetrically c-commands BC, and  
B asymmetrically c-commands C.

b. [A [[C...][B \_\_\_]]] ==> [[[C...][B]][A \_\_\_]]

From the linear order of ABC in (38a), we can derive the opposite linear order of CBA by the derivation in (38b). First, the constituent [C...] moves over B into the specifier of B or the specifier of a higher projection to yield [[C...] B]. Next, the entire constituent [[[C...] B]] moves to the specifier of or over A to yield [[[C...] B] A]. According to this roll-up derivation, verbs suffixed by several clausal functional heads are derived in the following way:

(39) Surface order: V-Voice-Aspect  
Base order: Aspect-Voice-V  
Derivation: Aspect-Voice-[V] *move V over Voice* →  
Aspect-[V-Voice] *move [V-Voice] over Aspect* →  
[V-Voice-Aspect]

Thus, the hierarchical ordering of the Japanese clausal functional heads is derived from the base order of the Polish clausal functional heads.

<sup>9</sup> Syntactically speaking, the Theme Vowel that merges directly with the root in Polish (and in all Slavic) has been identified as *v*<sup>0</sup> or some variants of it in Jabłońska (2007) and Wiland (2009). What is descriptively important here is just that it merges with the root before all other functional morphemes. Also, as it is well known, the phonetically null exponent of the Active Voice morpheme has its overt Passive counterpart *-n-/-t-/-on-* as, for example, in *rob-i-on-y* ‘done’ or *zab-i-t-y* ‘killed’.

With this background in mind, let us consider how the surface sequence of Japanese multiple verbs constitutes a mirror-image of the sequence of multiple verbal prefixes in Polish. Our proposal is that the same roll-up movement takes place with complex verbs, i.e. the base order of complex verbs is exactly the same as the Polish prefix cases of the fseq in (3), repeated below as (40). The minimal difference between Japanese and Polish is that Polish spells out this fseq without movement as pre-verbal prefixes and Japanese spells it out as verbs in a roll-up derivation.

(40) [ Dist<sup>0</sup> [ Att<sup>0</sup> [ Delim<sup>0</sup> [ Cuml<sup>0</sup> [ Sat<sup>0</sup> [ Perd<sup>0</sup> [ Exc<sup>0</sup> [ Rep<sup>0</sup> [ Compl<sup>0</sup>/Term<sup>0</sup> [ v<sup>0</sup>...

As an illustration of this point, consider the multiple verb in (2), which is repeated below for the sake of convenience. It is possible for the verb *hari* ‘paste’ to be followed by the saturative verb *tame* ‘save’, which in turn is followed by the distributive verb *nare* ‘get.used.to’. Here, as shown in (41c) below, the verb *hari* ‘paste’ originates in the lowest position and moves over the higher saturative verb *makuri* ‘roll.up’. Next, the complex verb [*hari* ‘paste’ - *makuri* ‘roll.up’] moves over a yet higher distributive verb *nare* ‘get.used.to’ to yield [[*hari* ‘paste’ - *makuri* ‘roll.up’] - *nare* ‘get.used.to’]. The reversed order of the second verb and the third verb is ill-formed, since the roll-up derivation may not yield such a sequence.

(41) DIST *nare* < SAT *makuri*

- a. Merii-ga posutaa-o hari-makuri-nare-ta.  
Mary-NOM poster-ACC paste-roll.up-get.used.to-PAST  
‘I got used to pasting up posters to the point that there is no poster left’
- b. \*hari-nare-maku(r)-ta.  
paste-get.used.to-roll.up- PAST
- c. ...[ DIST *nare* ‘get.used.to’...[SAT *makuri* ‘roll.up’ [ v<sup>0</sup> *hari* ‘paste’  
move v<sup>0</sup> over SAT →  
...[ DIST *nare* ‘get.used.to’...[v<sup>0</sup> *hari* ‘paste’ [SAT *makuri* ‘roll.up’...  
move [v<sup>0</sup> [SAT... ]] over DIST →  
...[ v<sup>0</sup> *hari* ‘paste’ [SAT *makuri* ‘roll.up’]] [DIST *nare* ‘get.used.to’]...

Thus, given the roll-up movement of the Japanese clause and the lack of the roll-up in the respective area of the clause in Polish, the base-generation of Polish prefixes and Japanese multiple verbs instantiate the same fine-grained fseq (with primitives such as ‘excessive’ or ‘cumulative’ as above heading their own projections in the syntax of both Polish and Japanese).

## 5. Partial roll-up in Bulgarian

At this point, let us come back to the fseq of verbal prefixes in Slavic. Unlike in Polish, which can stack up to two superlexical/vP-external prefixes at the same time, in Bulgarian a verb may host up to seven prefixes (though, as reported in Istratkova (2004), combinations of more than four prefixes are infrequent).

Istratkova (2004) considers the orders in which the superlexical prefixes can be stacked together and analyzes a large number of well-formed and ill-formed orders, as for instance in (42)-(44), and concludes that the surface order of Bulgarian prefixes is as in (45).

- (42) a. *iz-po-na-pro-dam*  
 COMPL-DIST-CUML-through-sell  
 ‘sell completely a lot of things one by one’  
 b. \**na-iz-po-pro-dam*, \**na-po-iz-pro-dam*, etc.

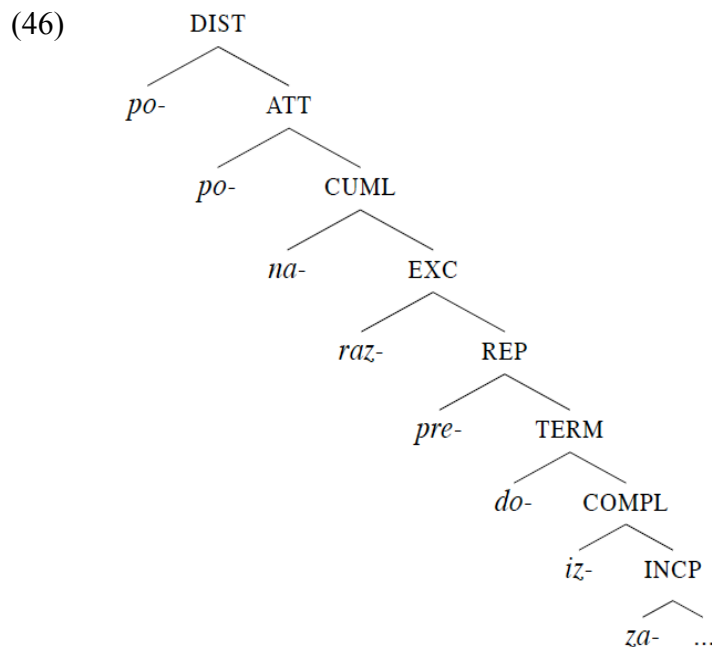
- (43) a. *za-iz-po-nareždam*  
 INCP-COMPL-DIST-arrange  
 ‘start arranging’  
 b. \**iz-po-za-nareždam*, \**iz-za-po-nareždam*

- (44) a. *iz-po-raz-kaža*  
 COMPL-DIST-EXC-narrate  
 ‘narrate completely one by one’  
 b. \**raz-iz-po-kaža*

(45) The surface order of superlexical prefixes in Bulgarian:

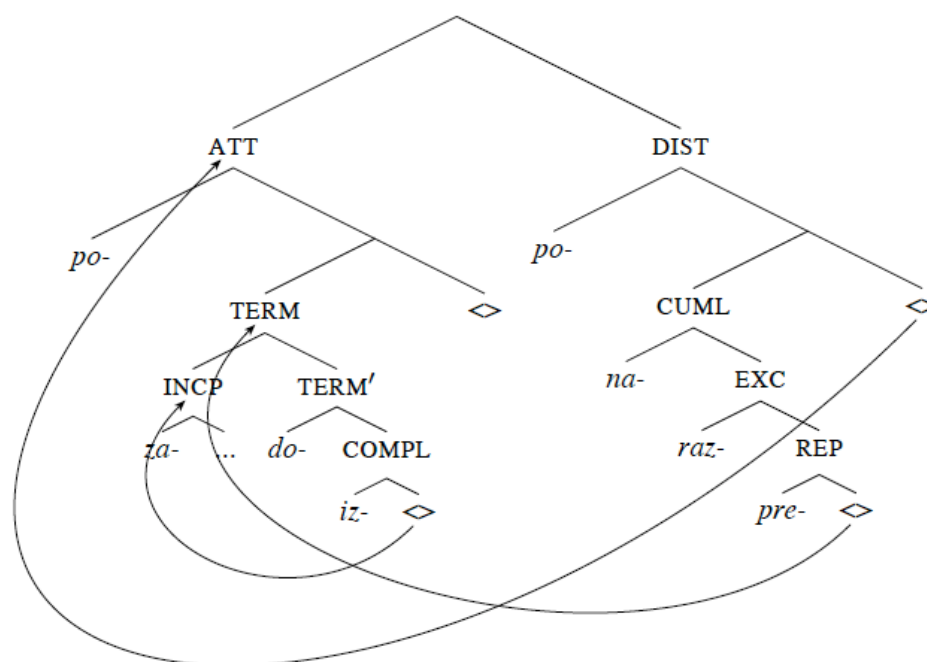
ATT > INCP > TERM > COMPL > DIST > CUML > EXC > REP  
*po za do iz po na raz pre*

The surface order in (45) considerably differs from the fseq of Polish prefixes in (3). However, what Istratkova tries to demonstrate in her paper, is that the prefixes inner to the verbal stem are derived lower as they fall in the scope of the outer prefixes. If this observation is on the right track, we can perhaps safely assume that Bulgarian prefixes are base-generated in an order which is consistent upon the same fseq as in Polish, that is as in (46) below.



As suggested in Wiland (2011), from this base-generated sequence we are able to derive the surface order of Bulgarian prefixes by applying (at least) four movements, all of which target the bottom layers of the tree. The way the surface order can be derived is as follows:

(47)



We see that in the surface positions in (45), some orders of prefixes in Bulgarian instantiate the mirror-image of the fseq in (46), which is consistent upon an even more refined fseq in (3), while some other orders instantiate (46) on the surface. For instance, repetitive *pre* follows excessive *raz* and cumulative *na* in both the surface and the base-generated form, but the whole subsequence *na > raz > pre* follows the terminative *do* and completive *iz* only in the surface form in (45) but not in the base-derived fseq in (46) (while both *do* and *iz* preserve the initial relative order in the surface form). In other words, Bulgarian exhibits a partial roll-up of the hierarchy in (46). If this is so, then Bulgarian is intermediate between Polish and Japanese with respect to the way it lexicalizes the fseq of positions (consistent with) (3): while it remains spelled out in Polish in the order it is base generated (i.e. without roll-up), in Japanese in the mirror fashion (i.e. with a full roll-up) and in Bulgarian with only a partial roll-up.

## References

- Aboh, Enoch. 2003. *Morpho-Syntax of Head-Complement Sequences*. Oxford: Oxford University Press.
- Baker, Mark. 1988. *Incorporation: A Theory of Grammatical Function Changing*. Illinois: University of Chicago Press.
- Caha, Pavel. 2009. The nanosyntax of case. PhD dissertation, University of Tromsø/CASTL.
- Cinque, Guglielmo. 1999. *Adverbs and Functional Heads: A Cross-linguistic Perspective*. New York: Oxford University Press.
- Cinque, Guglielmo. 2006. *Restructuring and Functional Heads*. Oxford: Oxford University Press.
- DiSciullo, Anna Maria, and Roumyana Slabakova. 2005. Quantification and aspect. In *Perspectives on aspect*, ed. by A. van Hout, H. de Swart, and H. Verkuyl, 61–80. Dordrecht: Springer.
- Istratkova, Vyara. 2004. On multiple prefixation in Bulgarian. *Nordlyd* 32,2: 301–321.
- Jabłońska, Patrycja. 2007. Radical decomposition and argument structure. PhD dissertation, University of Tromsø.
- Kageyama, Taro. 1993. *Bunpoo to Gokeisei* [Grammar and Word Formation]. Tokyo: Hituzi

- Syobo.
- Kageyama, Taro. 2009. Gengo no kozo seiyaku to jojutu kino [Structural constraints and predication functions in language]. *Gengo Kenkyu* 136: 1-34.
- Koopman, Hilda. 2005. Korean (and Japanese) morphology from a syntactic perspective. *Linguistic Inquiry* 36,4:601-633
- Matsumoto, Yo. 1996. *Complex Predicates in Japanese*. Stanford: CSLI Publications.
- Nishiyama, Kunio. 2008. V-V compounds. *Handbook of Japanese Linguistics*, ed. by Shigeru Miyagawa and Mamoru Saito, pp. 320-347, New York: Oxford University Press.
- Ramchand, Gillian. 2004. Time and the event: the semantics of Russian prefixes. *Nordlyd* 32,2:323–361.
- Romanova, Eugenia. 2004. Superlexical vs. lexical prefixes. *Nordlyd* 32,2:255–278.
- Svenonius, Peter. 2004a (ed.). *Nordlyd* 32,2: *Special Issue on Slavic Prefixes*.
- Svenonius, Peter. 2004b. Slavic prefixes inside and outside VP. *Nordlyd* 32,2:205–253.
- Wiland, Bartosz. 2009. Aspects of order preservation in Polish and English. PhD dissertation, University of Poznań.
- Wiland, Bartosz. 2011. The functional sequence of verbal prefixes: a view from Polish, Russian and Bulgarian. Paper presented at The State of the Sequence 2, CASTL, University of Tromsø, December 2011.
- Wiland, Bartosz. 2012. Prefix stacking, syncretism and the syntactic hierarchy. In *Slavic Languages in Formal Grammar. Proceedings of FDSL 8.5, Brno 2010*, ed. by Marketa Zikova and Mojmir Docekal, 307-324. Berlin/Frankfurt am Main: Peter Lang.
- Yumoto, Yoko. 2005. *Hukugoo-Doosi, Hasei-Doosi-no Imi-to Toogo* [The Semantics and Syntax of Compound Verbs and Derived Verbs]. Tokyo: Hituzi Shobo.