The symmetric syntax of Japanese complex verbs and Slavic prefixes

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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 parallism 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).

(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)
      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'
      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

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† We adopt the following abbreviations: ATT - attenuative, COMPL - complective, CUML - cumulative, DELIM - deliminative, 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 in Polish lexicalize the articulate sequence of aspectual heads generated on top of the vP:

\[ \text{dist}^{0} [ \text{att}^{0} [ \text{delim}^{0} [ \text{cuml}^{0} [ \text{sat}^{0} [ \text{perd}^{0} [ \text{exc}^{0} [ \text{rep}^{0} [ \text{compl}^{0}/\text{term}^{0} [ v^{0} [ ... \]

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
   \text{dist-exc-hit} offers
   'to make better offers (several times)'
   b. * prze-po-bijać
   \text{exc-dist-hit}

(5) a. na-do-krajać chleba
   \text{sat-compl-cut bread}
   'to slice even more bread'
   b. * do-na-krajać
   \text{compl-sat-cut}

(6) a. po-prze-pisywać
   \text{delim-rep-write}
   're-write something (a little bit)'
   b. * prze-po-pisywać
   \text{rep-delim-write}

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2 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.

3 The immediately pre-verbal head position is indicated in (3) as Compl^{0}/Term^{0} 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-konczyć 'to finish') and terminative od- (as in od-robić '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^{0}(ative) and Term^{0}(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 pięciolinię
       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) CUML na > PERD prze
   a. na-prze-pisywać się listów
      CUML-PERD-write self letters
      'to re-write letters (in bulk, for a long time)'
   b. * prze-na-pisywać się
      PERD-CUML-write self

(15) CUML na > TERM od
   a. na-od-rabiać się zadań domowych
      CUML-TERM-do self homework assignments
      'to do a lot of homework assignments'
   b. * od-na-rabiać się
      TERM-CUML-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 saturate, can stack with other prefixes (as in (16)) but not with one another (as in (17)).

(16) a. po-na-krajać
       DIST-CUML-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 deliminative 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 prz-) 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).'
       fans DIST-SAT-drank self beer.
       'The soccer fans have drank up beer (to the point of complete satisfaction).'

(22) Cumulative na-\(^4\)
    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,

\(^4\) 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.
lexically, items are in principle allowed to overspecify (or “span”) over syntactic representations in which each feature head 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 syncrtic po-, as in the lexical specifications given below:

\[
(23) \quad \text{[Dist}^0 \text{[Att}^0 \text{[Delim}^0 \text{[Cum}^0 \text{[Sat}^0 \text{[Perd}^0 \text{[Exc}^0 \text{[Rep}^0 \text{[Compl}^0 \text{[Term}^0 [...}
\]

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 syncrtic super-lexical prefixes in adjacent positions in such an fseq cannot be stacked, with an exception of the two syncrtic 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:

\[
(24) \quad \begin{align*}
\text{a. John}\text{-ga } & \text{ hon-o yomi-hazime-ta.} \\
& \text{John-NOM book-ACC read-begin-PAST} \\
& \text{‘John began to read a book.’}
\end{align*}
\]

\[
\begin{align*}
\text{b. John}\text{-ga } & \text{ Bill-o osi-taosi-ta.} \\
& \text{John-NOM Bill-ACC push-topple-PAST} \\
& \text{‘John pushed Bill down.’}
\end{align*}
\]

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.\(^5\)

\(^5\) 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\(^6\)
      John-NOM song-ACC sing-get.used.to-ASP-PRES
      ‘John is used to to singing a song.’

   EXC makas
      John-NOM Mary-ACC sing-exceed -ASP-PRES
      ‘John is outsinging Mary.’

(26) DIST nare < EXC makas
      John-NOM Mary-ACC sing-exceed-get.used.to-ASP-PRES
      ‘John is used to to outsinging Mary’
      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-pei-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) -pei-ru.
      poster-ACC paste-get.used.to-roll.up-ASP-PRES

(28) DIST nare < CUMUL tamer
   a. omoi miu-o tori-tame-nare-pei-ru.
      Heavy water-ACC collect-save-get.used.to-ASP-PRES
      ‘I am used to collecting water.’

\(^6\) 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 fist 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.’
   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.’

- 7 -
   heavy water-ACC collect-get.used.to-save-ASP-PRES

(29) DIST nare < EXC makes
      John-ACC eat-defeat-get.used.to-ASP-PRES
      'I am used to outeating John.'
      John-ACC eat-get.used.to-defeat-ASP-PRES

(30) DIST nare < SAT naos
   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 takusan no 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 takusan no 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:

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7 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 fist 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-
nares '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.'
- 8 -
(32) CUML tamer < REP naos
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-aru.
   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-aru.
   there many kimono-ACC sew-complete-save-ASP-PRES

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

(34) Sekken-o takai-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 \textit{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 \textit{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 \textit{narabe} ‘arrange’ of the form which could appear in a root clause:

(35) narabe-rare-pei-ta-yooda
    arrange-Passive-Aspect- tense-Mood
    ‘(Things) seem to have been arranged.’

\footnote{Some speakers give an opposite judgment of the sentences in (32), which involve the verb \textit{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 -ł-, 3,FEM,SG agreement morpheme -a- and the Mood particle -by (cf. for instance Jabłońska (2007) on Polish verbs). ⁹

(37) rob-i-ơ-l-a-by
    do-Theme Vowel-Voice-Tense-Agr3SG,FEM-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.

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⁹ Syntactically speaking, the Theme Vowel that merges directly with the root in Polish (and in all Slavic) has been identified as v₀ 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/-i/-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)  [ Dist⁰ [ Att⁰ [ Delim⁰ [ Cuml⁰ [ Sat⁰ [ Perd⁰ [ Exe⁰ [ Rep⁰ [ Comp⁰/[Term⁰ [ v⁰ …

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 makur  
           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’ [ v⁰ hari ‘paste’  
               move v⁰ over SAT →  
               …[ DIST nare ‘get.used.to’...[v⁰ hari ‘paste’ [SAT makuri ‘roll.up’…  
               move [v⁰ [SAT... ]] over DIST →  
               …[ v⁰ 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 Bulagarian 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-arrage
‘sstart arranging’

(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:
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

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