Distributive *po-* in Polish

Christopher Piñón
Universität Düsseldorf
pinon@phil-fak.uni-duesseldorf.de

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Abstract

The structure of this talk is as follows:

① Background
② Introducing distributive *po-*
③ Five properties of distributive *po-*
④ An analysis of distributive *po-*

Background

In Polish, as in comparable Slavic languages, we find a morphosyntactic distinction between *imperfective* (i) and *perfective* (p) verbs. Imperfective verbs are either unprefixed, as in (1a), or are derived from prefixed verbs by suffixation (or by a change in the verb stem vowel), as in (1b).

(1) a. budzić^{i} 'wake', chować^{i} 'hide', myć^{i} 'wash', pękać^{i} 'crack, split (intr.)', robić^{i} 'do, make', tonąć^{i} 'drown'

b. ob·całowywać^{i} 'kiss', od·pisywać^{i} 'reply (in writing)', od·skakiwać^{i} 'jump aside', o·twierać^{i} 'open', wy·chodzić^{i} 'go out', z·rywać^{i} 'pick'

Perfective verbs are mostly derived from unprefixed verbs by prefixation (although not always: see e.g. pęknąć^{p} 'crack, split (intr.)' in (2a)):

(2) a. z·budzić^{p} 'wake', s·chować^{p} 'hide', u·myć^{p} 'wash', pęknąć^{p} 'crack, split (intr.)', z·robić^{p} 'do, make', u·tonąć^{p} 'drown'

b. ob·całować^{p} 'kiss', od·pisać^{p} 'reply (in writing)', od·skoczyć^{p} 'jump aside', o·tworzyć^{p} 'open', wy·jść^{p} 'go out', z[e]·rwać^{p} 'pick'

A perfective verb and its imperfective counterpart form an *aspectual pair*. It is clear from (1) and (2) that aspectual

pairs may differ with respect to which member is more complex morphologically.

There are a number of diagnostics for distinguishing imperfective verbs from perfective ones in Polish. A standard one is that only imperfective verbs may co-occur with the future auxiliary *być*[i]:

(3) a. Tomasz będzie[i] mył[i] naczynia.
Tomasz will wash dishes-ACC
'Tomasz will wash the dishes.'
b. *Tomasz będzie[i] u·mył[p] naczynia.

(4) Tomasz u·myje[p] naczynia.
Tomasz washes dishes-ACC
'Tomasz will wash the dishes.'

Introducing distributive *po-*

Polish has a prefix *po-* that is productively used to create perfective verbs out of imperfective verbs. The characteristic semantic feature that *po-* brings to such verbs is that of *distributivity* (whence 'distributive *po-*'). The versions of the verbs in (1) with distributive *po-* are given in (5).

(5) a. po·budzić[p] 'wake', po·chować[p] 'hide', po·myć[p] 'wash', po·pękać[p] 'crack, split (intr.)', po·robić[p] 'do, make', po·tonąć[p] 'drown'

b. po·ob·całowywać[p] 'kiss', po·od·pisywać[p] 'reply (in writing)', po·od·skakiwać[p] 'jump aside', po·o·twierać[p] 'open', po·wy·chodzić[p] 'go out', po·z·rywać[p] 'pick'

Since the verbs in (2) are perfective, *po-* does not attach to them:

(6) *po·z·budzić[p] 'wake', *po·s·chować 'hide', . . . , *po·ob·całować[p] 'kiss', *po·od·pisać 'reply (in writing)', . . .

The sentences in (7) and (8) illustrate verbs with distributive *po-* and contrast them with their ordinary perfective forms.

(7) a. Tomasz po·mył[p] naczynia.
Tomasz *po*-washed dishes-ACC

'Tomasz washed each dish (the dishes one by one).'

b. Tomasz u·myłp naczynia.
'Tomasz washed the dishes.'

(8) a. Basia po·ob·całowywałap chłopaków.
Basia *po*-kissed boys-ACC
'Basia kissed each boy (the boys one by one).'
b. Basia ob·całowałap chłopaków.
'Basia kissed the boys.'

In what follows, I will call the domain over which *po-* quantifies the *domain of distribution* and the argument of the verb that *po-* relates to the *distributive argument*.

In the next section I will describe five salient properties of distributive *po-* that any analysis should account for.

Although distributive *po-* is known to Slavicists, I am not aware of any explicit analyses of *po-* in the literature.

Five properties of distributive *po-*

1. Although *po-*'s distributive argument is most typically an internal argument that is realized as an accusative case-marked object NP (see (7a) and (8a)), this is not always the case, as the following two examples show:

(9) a. Dzieci po·kończyły^{p} szkoły.
children *po*-finished schools-ACC
'Each child finished school (i.e., obtain an education).'
(distributive argument: external argument, realized as nominative case-marked subject NP)

b. Basia po·na·dawała^{p} imiona psom.
Basia *po*-gave names-ACC dogs-DAT
'Basia gave names to each dog.'
(distributive argument: internal argument, realized as dative case-marked indirect object NP)

Strictly speaking, a sentence like (9a) is ambiguous: in the appropriate context it can also mean that the children finished each school. However, what it *cannot* mean is that each child finished each school. In other words, *po-* cannot have more than one distributive argument.

2. Distributive *po-* requires that the domain of distribution contain at least two objects. If the domain of distribution contains only a single object for the event type in question, the sentence is unacceptable:

(10) a. Kinga po·chowała^{p} książki.
Kinga *po*-hid books-ACC
'Kinga hid each book.'
b. #Kinga po·chowała^{p} książkę.
Kinga *po*-hid book-ACC

(11) a. Dzieci po·wy·chodziły^{p}.
children *po*-went-out
'Each child went out.'
b. #Tomasz po·wy·chodził^{p}.
Tomasz *po*-went-out

In contrast, ordinary perfective verbs impose no such requirement:

(12) a. Kinga s·chowała^{p} książkę.
Kinga hid book-ACC
'Kinga hid the book.'
b. Tomasz wy·szedł^{p}.
Tomasz went out
'Tomasz went out.'

The requirement that the domain of distribution contains at least two objects is semantic and not syntactic. If a syntactically singular NP introduces a domain of distribution containing at least two objects for the event type in question, then no conflict arises:

(13) a. Basia po·dziurawiła^{p} piłkę.
Basia *po*-made-holes-in ball-ACC
'Basia made holes in (each part of) the ball.'
b. Mur po·pękał^{p}.
wall *po*-cracked
'(Each part of) the wall cracked.'

3. Distributive *po-* requires that the events denoted take place *successively* (though the succession need not be immediate):

(14) a. Tomasz po·mył^{p} dzieci jedno po
Tomasz *po*-washed children-ACC one-ACC after
drugim.
other-LOC
'Tomasz washed the children one after another.'
b. Basia po·o·twierała^{p} okna jedno
Basia *po*-opened windows-ACC one-ACC
po drugim.
after other-LOC
'Basia opened the windows one after another.'

If we attempt to force the events to be simultaneous, the result is unacceptable:

(15) a. #Tomasz po·mył^{p} wszystkie dzieci
Tomasz *po*-washed all-ACC-PL children-ACC
naraz.
at-the-same-time

'Tomasz washed all the children at the same time.'

b. #Basia po·o·twierała^{p} wszystkie okna
Basia *po*-opened all-ACC-PL windows-ACC
naraz.
at-the-same-time
'Basia opened all the windows at the same time.'

In contrast, ordinary perfective verbs do not specify whether the events described are successive or not (though pragmatic considerations will often decide this):

(16) a. Tomasz u·mył^{p} wszystkie dzieci naraz.
'Tomasz washed all the children at the same time.'

b. Basia o·tworzyła^{p} wszystkie okna naraz.
'Basia opened all the windows at the same time.'

4. Distributive *po-* does not apply to *stative* verbs. Although the situations that would be described by the sentences in (17) are imaginable (e.g., in (17a), Tomasz's successive hearing of all the sounds), the forms #*po·lubić*^{p} and #*po·słyszeć*^{p} (as well as other derivations from stative verbs) are unacceptable on the distributive reading of *po-*.

(17) a. #Tomasz po·słyszał^{p} wszystkie dźwięki.
Tomasz *po*-heard all-ACC-PL sounds-ACC

(Unacceptable on distributive reading of *po*-)

b. #Basia po·lubiła^{p} wszystkich językoznawców w instytucie.
Basia *po*-liked all-ACC-PL linguists-ACC in institute-LOC
(Unacceptable on distributive reading of *po*-)

However, there is no restriction against ordinary perfective verbs being derived from stative verbs:

(18) a. Tomasz u·słyszał^{p} wszystkie dźwięki.
Tomasz heard all-ACC-PL sounds-ACC
'Tomasz heard all the sounds.'

b. Basia po·lubiła^{p} wszystkich języknawców w instytucie.
Basia became-fond-of all-ACC-PL linguists-ACC in institute-LOC
'Basia became fond of all the linguists in the institute.'
(Note: this is an inchoative use of *po*-)

5. Although distributive *po*- is compatible with a number of determiners (as seen in (19)), it is sometimes incompatible with the distributive quantifier *każdy* 'each, every' (as seen in (20)).

(19) a. Basia po·otwierała^{p} wszystkie okna.
Basia *po*-opened all-ACC-PL windows-ACC
'Basia opened all the windows one by one.'

b. Basia po·o·twierała^{p} większość okien.
Basia *po*-opened majority-ACC windows-GEN
'Basia opened most (i.e., the majority) of the windows one by one.'

c. Basia po·o·twierała^{p} wiele okien.
Basia *po*-opened many-ACC windows-GEN
'Basia opened many windows one by one.'

d. Basia po·o·twierała^{p} kilka okien.
Basia *po*-opened several-ACC windows-GEN
'Basia opened several windows one by one.'

(20) #Basia po·otwierała^{p} każde okno.
Basia *po*-opened each-ACC window-ACC

At the same time, the following examples show that there is no inherent incompatibility between *po-* and *każdy*:

(21) a. Basia po·dziurawiła^{p} każdą piłkę.
Basia *po*-made-holes-in each-ACC ball-ACC
'Basia made holes in each (part of each) ball.'

b. Każdy mur po·pękał^{p}.
each wall *po*-cracked
'Each (part of each) wall cracked.'

An analysis of distributive *po-*

Independently of *po-*, there is good reason to think that there is a morphosyntactic feature [±Perf(ective)] in Polish (as in comparable Slavic languages). Imperfective verbs are marked [−Perf]; perfective verbs are marked [+Perf]. Distributive *po-*, like nearly every other verbal prefix in Polish, derives [+Perf] verbs from [−Perf] verbs, as schematized in (22).

(22) po- (distributive), $[_{\mathrm{V}[+\mathrm{Perf}]}$ — $[_{\mathrm{V}[-\mathrm{Perf}]}\ \alpha]$

For the semantic analysis of *po-*, I presuppose four pairwise disjoint domains of *physical objects*, *events* (including processes), *states*, and *times*, together with associated sets of sorted variables:

- physical objects: x, y, z, . . .
- events: e, e', e'', . . .
- states: s, s', s'', . . .
- times: t, t', t'', . . .

In addition, I assume a *proper part* relation ('$\sqsubset$') on the union of these four domains.

Employing a, b, c, . . . as unsorted individual variables and P as an unsorted one-place predicate variable, we can define the following standard mereological notions:

(23) a. $x \sqsubseteq y \stackrel{\text{def}}{=} x \sqsubset y \vee x = y$
(a is part of b)

b. $a \circ b \stackrel{\text{def}}{=} \exists c[c \sqsubseteq a \wedge c \sqsubseteq b]$
(a and b overlap)

c. $\sigma(P) \stackrel{\text{def}}{=} \iota a[\forall b[b \circ a \leftrightarrow \exists c[P(c) \wedge c \circ b]]$
(the sum of P)

Finally, I assume a *temporal trace* function ('τ') which, when applied to an event e or a state s, yields the time of e or s.

I define the semantics of *po-* as a relation between events e, physical objects x, and two-place relations R between events and physical objects as follows:

(24) po- (distributive) $\rightsquigarrow$
① $\lambda R \lambda x \lambda e[e = \sigma(\lambda e'[\exists y[e' \sqsubseteq e \wedge y \sqsubseteq x \wedge R(e', y)]]) \wedge$
② $\forall y[y \sqsubseteq x \rightarrow \exists e'[e' \sqsubseteq e \wedge R(e', y)]] \wedge$
③ $\exists e' \exists e'' \exists y \exists z[e' \sqsubseteq e \wedge e'' \sqsubseteq e \wedge y \sqsubseteq x \wedge z \sqsubseteq x \wedge \neg(y \circ z) \wedge R(e', y) \wedge R(e'', z)] \wedge$
④ $\forall e' \forall e''[\exists y \exists z[e' \sqsubseteq e \wedge e'' \sqsubseteq e \wedge y \sqsubseteq x \wedge z \sqsubseteq x \wedge R(e', y) \wedge R(e'', z)] \rightarrow (e' = e'' \vee \neg(\tau(e') \circ \tau(e'')))] \wedge$
⑤ $\forall e' \forall e''[e' \sqsubseteq e \wedge e'' \sqsubseteq e \wedge \neg(e' = e'') \rightarrow \neg\exists y[y \sqsubseteq x \wedge R(e', y) \wedge R(e'', y)]]]$,
$\stackrel{\text{def}}{=} Distr$

Here are some guiding remarks on this formula:

① states that e is the sum of events e' such that R holds of e' and a part y of x.

② states that every part y of x participates in a subevent e' of e such that R holds of e' and y.

③ states that x has at least two non-overlapping parts y and z that participate in subevents e' and e'' of e such that R holds both of e' and y and of e'' and z.

④ states that all subevents of e that stand in relation R to a part of x either are identical or do not overlap temporally.

⑤ states that no part of x participates in two subevents of e (which excludes iterativity).

As an example, I present the derivation of (19a):

(25)
a. o·twierać$^{\mathrm{i}}$ 'open' $\rightsquigarrow \lambda y \lambda x \lambda e[Open(e, x, y)]$
b. po·o·twierać$^{\mathrm{p}}$ '*po*-open' $\rightsquigarrow$
$\lambda y \lambda x \lambda e[Distr(e, y, \lambda y' \lambda e'[Open(e', x, y')])]$
c. (wszystkie) okna '(all) the windows' $\rightsquigarrow$
$\iota x[x = \sigma(\lambda y[Windows(y)]) \wedge Windows(x)]$,
$\stackrel{\mathrm{def}}{=} All\text{-}The\text{-}Windows$
d. Basia $\rightsquigarrow Basia$
e. Basia po·o·twierać$^{\mathrm{p}}$ (wszystkie) okna $\rightsquigarrow$
$\lambda e[Distr(e, All\text{-}The\text{-}Windows,$
$\lambda y' \lambda e'[Open(e', Basia, y')])]$

To see why (20) is unacceptable, we first need a plausible analysis of *każde okno* 'each window':

(26) każde okno 'each window' $\rightsquigarrow$
$\lambda R \lambda e[\forall x[Window(x) \rightarrow$
$\exists e'[e' \sqsubseteq e \wedge R(e', x)] \wedge$
$e = \sigma(\lambda e'[\exists x[e' \sqsubseteq e \wedge Window(x) \wedge$
$R(e', x)]])]$

If applied to *po·o·twierać*$^{\text{p}}$ '*po*-open' in (25b), it would be required that Basia open at least two non-overlapping parts of every window (see ③ in (24)), which would be odd. In other words, (20) is unacceptable for the same reason that a singular object NP is unacceptable:

(27) #Basia po·otwierała$^{\text{p}}$ okno.
Basia *po*-opened window-ACC

References

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