

A NOTE ON LEXICALIZING ‘WHAT’ AND ‘WHO’ IN RUSSIAN AND IN POLISH

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ABSTRACT

The contrast between the Russian *čto* and the Polish *co* ‘what’ is syntactic and reflects the way in which an identical sequence of features in the syntactic representation becomes realized as morphology. Specifically, I argue that this scenario follows from a spell-out mechanism outlined in Starke (2018), where prefix formation, as in the Russian tri-morphemic *č-t-o* but not in the Polish bi-morphemic *c-o*, takes place in order to spell out a feature which cannot be spelled out in the mainline derivation. Next, I explore a possibility that the *wh*-prefix in *kto* ‘who’, the same form in Russian and Polish, merges with a syntactically different stem than the one present in the lexical items for ‘what’, a scenario more transparently visible on the example of English *wh-at* and *wh-o*.

KEYWORDS: *wh*-pronouns, prefix formation, spellout, Nanosyntax

1. Wh exponent in *čto*, *co* ‘what’ and *kto* ‘who’

The forms of the interrogative pronoun ‘what’ are different in Polish and in Russian: *co* [t̪so] and *čto* [ʃto], respectively. In turn, the forms of the interrogative person pronoun *kto* [kto] ‘who’ are identical, as shown in:

- | | | | | | | | |
|-----|-----|---------------|-------|-----|-----|--------------|-------|
| (1) | (a) | Co to jest? | (Pol) | (2) | (a) | Kto to jest? | (Pol) |
| | | what it is | | | | who it is | |
| | (b) | Čto èto? | (Rus) | | (b) | Kto èto? | (Rus) |
| | | what it | | | | who it | |
| | | ‘What is it?’ | | | | ‘Who is it?’ | |

A clear distributional relation between the *wh*-prefixes *k-* and *č-* in the Russian person and kind queries does not carry over to the *k-* and *c-* in the Polish *kto*

‘who’ and *co* ‘what’. The problem of the unattested **cto* in Polish is not resolved by phonology as there is no rule in Polish phonology that leads to t-truncation and there is no constraint that rules out a word-initial *ct* [tst] cluster, either.¹ In fact, all word-initial consonantal clusters are in principle permissible in Polish, the position advanced in Scheer (2007), who submits that all non-existing examples of word-initial consonantal clusters in Polish (among other Slavic languages) are accidental rather than systematic gaps.

Specifically, Scheer argues that in languages where sonority increases in word-initial clusters any non-occurring #RT cluster is always a systematic gap.² For example, in a TR-only language like English, *lbick* is an impossible word due to the violation of the increasing sonority rule, while *blick* is a possible word as it observes the sonority rule. In contrast, in languages that do not observe the increasing sonority rule, any unattested word-initial consonantal cluster is a lexical accident. Scheer shows this on the example of #RT and #TR clusters in “anything goes” Slavic languages. For example, the #rt cluster appears in the Polish *rtęć* ‘mercury’ but the #rp cluster is unattested.³

While the Slavic #RT and #TR clusters constitute a robust illustration of a general situation where in ‘anything goes’ languages any missing word-initial consonantal cluster is an accidental gap, Scheer (2007: 349) states that the same result carries over to non-TR clusters, including #TT and #RR clusters. For the case we are considering, this means that the unattested word-initial *ct* [tst] in Polish resists a phonological account.

In what follows, I will argue that the contrast between the Russian *čto* and Polish *co* is syntactic and results from the way the common underlying syntactic representation of these pronouns (i.e. a hierarchical structure) is realized as morphology (i.e. a linear structure). Specifically, the Russian *č-* is a wh-prefix on a case inflected bi-morphemic demonstrative stem *t-o*, while the Polish *c-* realizes both the demonstrative stem and the wh-feature. I will argue that such a pattern follows from a spell-out mechanism advanced in Starke (2018), where prefix formation, as in the case of Russian *č*, takes place in order to spell out a feature which otherwise cannot be spelled out in the mainline derivation.

Such an explanation, however, does not yet account for the contrast between the wh-exponents that we find in *č-t-o/c-o* ‘what’ on the one hand and in *k-t-o*

¹ Though the *ct* [tst] cluster does occur in Polish word-internally, it does not occur word-initially: both within a single morpheme as in *oct-u* ‘vinegar-GEN’ and at the morpheme boundary in compounds as in *brac-two* ‘brother-hood’.

² T stands for an obstruent, R for a sonorant, and # for a word boundary.

³ More precisely, Scheer (2007: 351) reports that out of 126 logically possible sonorant-obstruent sequences (6 sonorants, 21 obstruents), 20 are attested word-initially in Polish and the rest are accidental gaps, whose absence in word-initial clusters is not attributed to any phonological constraint.

‘who’ on the other, which indicates that *k-* spells out a different lexical entry than *č-* and *c-* do. Essentially, *č-/c-* lexicalize the wh-feature in the kind query ‘what’, while *k-* lexicalizes the wh-feature in personal pronouns (and in a variety of other stems, too, as for instance in the Polish *k-iedy* ‘when’, *do-k-ąd* ‘where to’, or in *g-dzie* ‘where’ and *g-dy* ‘when’, where the prefixal *g-* [g] appears to be a voiced allomorph of *k-* appearing before [d]).

In a system like Starke (2018), the position of lexical items in a morphological representation (including the prefix vs. suffix distinction) follows from the spell-out procedure based on the shape of lexical entries. Under such view, the *č/c-* vs. *k-* contrast should reflect a structural difference of lexical items for kind and person queries, a possibility I will explore in what follows.

2. Demonstrative stem

Descriptively speaking, Polish and Russian wh-words like *k-to* and *č-to* contain a demonstrative pronoun *to*, which itself comprises a nominal root *t-* and a neuter nominative case suffix *-o*, which shows syncretism with the accusative, as indicated in the declension paradigms of the singular demonstrative:⁴

(3) (a) Polish

	M	F	N
NOM	t-en	t-a	t-o
ACC	t-ego	t-ę	t-o
GEN	t-ego	t-ej	t-ego
DAT	t-emu	t-ej	t-emu
LOC	t-ym	t-ej	t-ym
INST	t-ym	t-ą	t-ym

(b) Russian

	M	F	N
NOM	t-ot	t-a	t-o
ACC	t-ogo	t-u	t-o
GEN	t-ogo	t-oj	t-ogo
DAT	t-omu	t-oj	t-omu
LOC	t-om	t-oj	t-om
INST	t-im	t-oj	t-im

Just like English, Polish and Russian make a two-way morphological distinction between adnominal forms for *this* and *that*: *to* and *tamto* in Polish, *èto* and *to* in Russian. These two forms are used to describe a three-way deictic contrast between the proximal (close to speaker), the medial (close to hearer), and the distal (far from speaker and hearer).⁵

Cross-linguistically, such a three-way contrast is realized by one, two, or three distinct lexical items. An example of a lexical item that is used in all three

⁴ The suffix *-o* is an exponent of neuter nominative and accusative case also for a considerable subset of lexical nouns, e.g. *okn-o* ‘window-NOM/ACC’ (Pol & Rus).

⁵ Polish *to* and Russian *èto* also serve as indeclinable pronouns in *this is/these are* constructions as in (i)-(ii) below where, unlike in English, they do not show the number concord with the noun.

- (8) Spanish
 este / ese / aquel
 PROX MED DIST
- (9) Japanese (Hoji et al. (2003: 97))
 ko- / so- / a-
 PROX MED DIST

Lander and Haegeman (2016) argue that the proximal–medial–distal contrast reflects a universal deictic syntactic structure in which the proximal is structurally contained within the medial, which is structurally contained within the distal, a containment relation that can be described as in:

- (10) distal > medial > proximal

A tool that Lander and Haegeman adopt to turn this containment relation into a morphological representation is phrasal spell-out, an essential feature of Nanosyntax, which I will outline in certain detail in the following section. In such an approach, deictic markers are lexical items that spell-out phrasal layers of the structural representation of the sequence in (10). This can be illustrated on the example of Japanese proximal *ko-*, medial *so-*, and distal *a-* as in:⁷

- (11)
-
- ```

graph TD
 DistP["DistP ⇒ a"] --- Dist["Dist°"]
 DistP --- MedP["MedP ⇒ so"]
 MedP --- Med["Med°"]
 MedP --- ProxP["ProxP ⇒ ko"]
 ProxP --- Prox["Prox°"]

```

Lander and Haegeman argue that the evidence for the sequence in (11) comes from morphological containment and syncretic alignment found between the markers of spatial deixis.

The argument from morphological containment is based on attested patterns of polymorphemic markers of spatial deixis, which are consistent with the hierarchy in (11). The attested patterns include the proximal marker inside the me-

<sup>7</sup> Throughout the paper, ⇒ indicates how a node in a syntactic representation is spelled out and ⇔ indicates the pairing between the structure and the phonetic exponent of a lexically stored tree.

dial marker, as for instance in Palauan (Austronesian), where the proximal *ngile* (related to the 1st person exclusive) is contained in the structure of the medial *ngile-cha* (related to the 2nd person), as described in (12b).

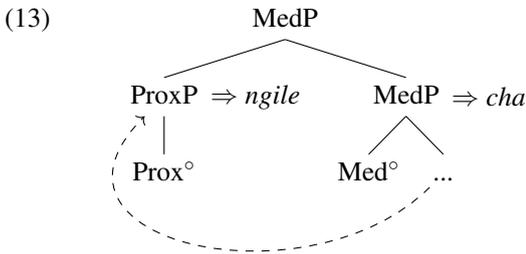
(12) Palauan (Janssen (2004: 989–990) as cited in Lander and Haegeman (2016: 32))

(a) *ngile* / *ngilecha*

PROX MED

(b) [MED [PROX *ngile*]-*cha*]

The bi-morphemic medial marker *ngile-cha* can be derived by remerging ProxP *ngile* with MedP. Such a movement allows the target node MedP to spell-out as *-cha*, as shown in:<sup>8</sup>



Other attested patterns include the proximal contained in the medial and the distal as in Wailevu Fijian (Austronesian) in (14) or in the marker that is syncretic for the medial/distal as in Wargamay (Australian) in (15).

(14) Wailevu Fijian (Ross (2007: 278) as cited in Lander and Haegeman (2016: 33))

(a) *yā* / *yāri* / *yaðei*

PROX MED DIST

(b) [MED [PROX *yā*]-*ri*]

(c) [DIST [PROX *ya*]-*ðei*] (on the assumption that *yā* surfaces as *ya* in front of *-ðei*)

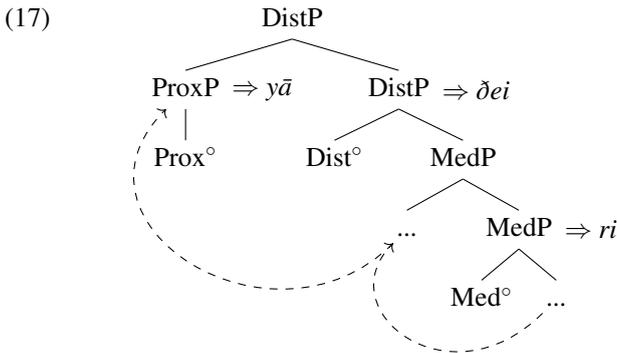
<sup>8</sup> See Caha (2011) for laying out the rationale behind the idea of spell-out driven movement – a tool that has been since used in the work on Nanosyntax – and its application in the derivation of case paradigms.

- (15) Wargamay (Dixon (1981: 44–45) as cited in Lander and Haegeman (2016: 34))
- (a)  $\mu\eta\eta ga / \mu\eta\eta ga\dot{g}i$   
 PROX DIST/MED
- (b)  $[DIST/MED [PROX \mu\eta\eta ga]-\dot{g}i]$

Let us note that the  $Med^\circ$  feature in Wailevu Fijian is spelled out in both the medial demonstrative *ya-ri* as *-ri* and in the distal demonstrative *ya- $\delta ei$*  as part of *- $\delta ei$* , while the form *\*ya-ri- $\delta ei$*  is unattested. The non-existence of such a form reveals that the lexical entry for *- $\delta ei$*  is defined in the lexicon as in (16c) among the list of entries containing deictic features:

- (16) Lexical entries in Wailevu Fijian
- (a)  $[Prox^\circ] \Leftrightarrow ya$
- (b)  $[Med^\circ] \Leftrightarrow -ri$
- (c)  $[Dist^\circ [Med^\circ]] \Leftrightarrow -\delta ei$

The insertion of  *$\delta ei$*  in the syntactic node *DistP* over-rides the earlier spell-out of *MedP* as *-ri*, as illustrated in:



The distal demonstrative *ya- $\delta ei$*  is, thus, derived by successive-cyclic movement of *ProxP ya*. The unattested form *ya-ri- $\delta ei$*  would be derived by the movement of the *MedP ya-ri* on top of *DistP* if the lexical entry for *- $\delta ei$*  included only one feature  $Dist^\circ$  rather than a complex feature structure in (16c).

A remark about the spell-out and over-riding is in order here. In Nanosyntax,

each application of merge is followed by an attempt to spell-out. That is, in order to lexicalize distal or medial structures like the ones shown in (11), (13), or (17), we attempt to spell-out each feature,  $\text{Prox}^\circ$ ,  $\text{Med}^\circ$ , and  $\text{Dist}^\circ$ , if present, immediately upon their mergers in the phrase marker. This results in a scenario where a lexical entry that matches a bigger tree always over-rides the lexical entries that match its subconstituents, the principle referred to in the literature on Nanosyntax as ‘cyclic over-ride’ (see Starke (2009: 4)).

With this remark, let us return to the arguments from lexical containment for the existence of the syntactic ‘ $\text{DIST} > \text{MED} > \text{PROX}$ ’ sequence given in Lander and Haegeman (2016), who also list Boumaa Fijian as an example of the language where the medial is contained in the distal and the distal forms a prefix on the contained medial, as in:

- (18) Boumaa Fijian (Ross (2007: 278) as cited in Lander and Haegeman (2016: 33))
- (a)  $y\bar{a}$  /  $may\bar{a}$   
       MED DIST
- (b) [ $\text{DIST}$   $ma$ -[ $\text{MED}$   $y\bar{a}$ ]]

The set of attested patterns is completed by the proximal contained in the medial contained in the distal as in Ewondo (Niger-Congo, A72), as shown on the example of class 2 plural proximal marker  $m\bar{i}$ :

- (19) Ewondo (Redden (1980: 67–70))
- (a)  $m\bar{i}$  /  $m\bar{i}l\bar{i}$  /  $m\bar{i}l\bar{i}l\bar{i}$   
       PROX MED DIST
- (b) [ $\text{DIST}$  [ $\text{MED}$  [ $\text{PROX}$   $m\bar{i}$ ]- $l\bar{i}$ ]- $l\bar{i}$ ]

The attested patterns conform to the hierarchy in (11) in the sense that markers that are structurally smaller are morphologically contained in the markers that are structurally bigger. At the same time, Lander and Haegeman (2016) report that the patterns where the medial is contained within the proximal and the distal is contained within the medial or the proximal have so far been unattested, as predicted by the functional sequence in (11).

In turn, the argument from syncretism in favor of (11) is based on the assumption that syncretic alignment anchors structural containment since it only targets contiguous layers of structure. This assumption stems from the observation that a more complex structure and a less complex structure are not realized by an exponent A if structures that are in between them in terms of complexity

are realized by an exponent B, the generalization that has become known as the \*ABA since Bobaljik's (2012) work on suppletion.<sup>9</sup>

The \*ABA generalization follows from a major premise behind Nanosyntax, namely that spell-out is regulated by the Superset Principle defined as in:

- (20) Superset Principle  
*A phonological exponent of a lexical item is inserted into a syntactic node if its lexical entry has a subconstituent which matches that node (Starke (2009)).*

If there are multiple lexical items competing for insertion, the choice which one is inserted is controlled by the Elsewhere Principle defined as in:

- (21) Elsewhere Principle  
*Where several items meet the conditions for insertion, the item containing fewer features unspecified in the node must be chosen.*

To illustrate how the Superset Principle rules out ABA patterns from grammar, let A stand for the English demonstrative *this*, whose lexical entry is described as in (22a), and let B stand for *that* whose lexical entry is described as in (22b).<sup>10</sup>

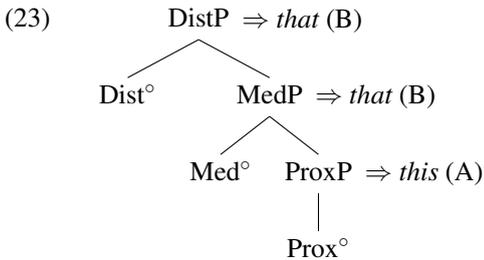
- (22) Lexical entries in English (simplified)
- (a) [ Prox<sup>o</sup> ] ⇔ *this*
- (b) [ Dist<sup>o</sup> [ Med<sup>o</sup> [ Prox<sup>o</sup> ]]] ⇔ *that*

These lexical entries capture the fact that the demonstrative *this* (form A) has only the proximal reading while *that* (form B) has two readings, medial and distal. On the strength of the Superset Principle, the layers of the syntactic representation in (23) are spelled out in the following way:

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<sup>9</sup> Syncretism has been shown to be restricted to contingent layers of structure in, among others, Caha's work on case (e.g. Caha (2011)), class markers in Bantu languages (Taraldsen (2010)), spatial expressions (Pantcheva (2011)), aspectual prefixes (Wiland (2012)), Germanic wh-pronouns (Vangsnes (2013)), complementizers (Baunaz and Lander (2017), Baunaz (2018), Wiland (2018)), negation marking (De Clercq (2018)), participles (Starke (2006), Taraldsen Medová and Wiland (2018)), and internal structure of verbs (Taraldsen Medová and Wiland (to appear)).

<sup>10</sup> For the purposes of this illustration let us ignore the fact that English demonstrative pronouns are bi-morphemic and that the deictic contrast is lexicalized together with the number as the portmanteau *-is/-esel/-atl/-ose* suffix on *th-*.



The nodes DistP and MedP are both spelled out as *that* since they constitute the superset and a subset of the lexical entry in (22b). The ProxP node, which is also a subset of the entry in (22b), is spelled out by *this* on the strength of the Elsewhere Principle in (21), since (22a) is a more specific match for ProxP than (22b).

Since *that* spells out the proximal as its own subset and as the superset of *this*, there is no way to arrange the exponents of the proximal, the medial, and the distal such that the ABA pattern can arise. However, since *that* shows the medial=distal syncretism, the ABB pattern can also reflect the 'PROX < DIST < MED' containment. Such an ordering is ruled out by cross-linguistically attested PROX=MED syncretism to the exclusion of DIST as in the case of the Polish *to* in (5), or the Bulgarian *tova* as in:

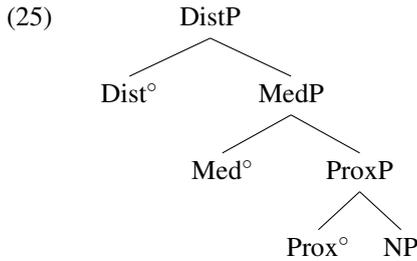
- (24) Bulgarian  
       tova        / onova  
       PROX/MED DIST

At the same time, Lander and Haegeman report that out of 5 logical possibilities of syncretism that can be attested between the proximal, the medial, and the distal (including a triplet as in French in (4) or non-syncretism as in Japanese in (9)) the only pattern that is unattested is DIST=PROX to the exclusion of MED, that is the ABA pattern in the 'PROX < MED < DIST' hierarchy in (11).

While the hierarchy in (11) appears to be on the right track, the Polish and Russian facts indicate that it should be updated with a nominal element, which projects the case layers in the extended projection of the demonstrative pronoun.<sup>11</sup> For the purposes of the discussion of demonstratives and wh-pronouns

<sup>11</sup>The presence of the nominal base in the demonstrative pronoun is manifested by neuter and masculine nominative suffixes. Polish neuter and masculine exponents of the nominative case are *-o* and zero, respectively, while the exponents in the adjectival declension are *-e* in neuter and zero in the masculine. Adjectives in Polish are easily recognized by the presence of the *-i/-y* allomorph suffix in masculine (most likely an adjectival thematic morpheme

*co* and *čto* 'what', I will represent this (pro)nominal element simply as the NP of some complexity at the base of the sequence in:



and I will refine its structure into a more meaningful representation at a point where it becomes relevant later in the paper.

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that is undeleted by a phonological rule of Vowel Truncation before a zero exponent of the masculine nominative, an issue irrelevant here beyond the recognition of the *-i/-y* suffix as an indication of the adjectival stem). In Russian, we see the same pattern, save for the fact that Russian has the adjectival thematic suffix *-[oj]/-[yj]*, which is preserved before the case suffix. This suffix precedes the case ending in the so-called long form of the attributive adjective. The *-[oj]/-[yj]* adjectival thematic suffix is absent in nouns and in demonstratives, as shown in:

- (i) (a) *t-o*                      *star-e*              *drzew-o*  
           PROX/MED-N.NOM old-N.NOM tree-N.NOM  
           'this/that old tree'
- (b) *ten*                      *star-y*              *stół*  
           PROX/MED<sub>M</sub>.NOM old-M.NOM table<sub>M</sub>.NOM  
           'this/that old table'
- (ii) (a) *t-o*                      *star-[oj]-e*          *derev-o*  
           MED/DIST-N.NOM old-LF-N.NOM tree.N.NOM
- (b) *tot*                      *star-[yj]*              *stol*  
           MED/DIST<sub>M</sub>.NOM old-LF.M.NOM table<sub>M</sub>.NOM

It has been argued in Halle and Matushansky (2006) on the basis of Russian that case exponents are shared between adjectives and nouns to the effect that there is no separate adjectival declension class. However, the contrast in nominative and the lack of long form morphology on Russian demonstratives indicates that it is safe to assume that demonstratives have a nominal rather than adjectival stem.

## 3. Spelling out the demonstrative stem

As repeated below from (5)-(6),

(26) to / tamto auto (Pol)  
 PROX/MED DIST car<sub>N</sub>

(27) èto / to plat'e (Rus)  
 PROX MED/DIST dress<sub>N</sub>

the Polish proximal/medial marker and both markers in Russian do not show overt morphological containment of the type we find in Palauan, Wargamay, Fijian, or Ewondo. This indicates that these lexical items spell out spans of the tree in (32) in a similar manner to what we find in English. The Polish distal marker *tamto*, however does contain the proximal/medial *to*. The morpheme that is prefixed onto the *t-* stem (of case inflected *t-o*, cf. (3)) is a distal locative reinforcer *tam* 'there'.

Polish *tu* 'here' and *tam* 'there' are indeclinable locative adverbs, as in:

(28) Tu / tam jest zimno  
 here / there is cold  
 'It's cold here/there.'

We can observe that *tam* 'there' and in certain contexts also *tu* 'here', too, can serve also as demonstrative reinforcers, which can be optionally placed after the demonstrative pronoun just like *here* in a (non-standard) English *this here big house*, as in:<sup>12</sup>

(29) (a) to                                    ??tu / tam dziecko  
 PROX/MED<sub>M.NOM</sub> here there child<sub>M.NOM</sub>  
 'this here child'

(b) tej                                    tu / tam dziewczynie  
 PROX/MED<sub>F.DAT</sub> here there girl<sub>F.DAT</sub>  
 'to this here human'

<sup>12</sup>The demonstrative-reinforcer constructions have been well-attested across Germanic and Romance (e.g. Bernstein (1997)). The usual description of such a construction involves a demonstrative and an adverb or other element that describes location, which appears in a certain position with respect to the demonstrative and other constituents of the noun phrase.

- (c) tego tu / tam chłopaka  
 PROX/MED<sub>M,GEN</sub> here there boy<sub>M,GEN</sub>  
 'of this here boy'

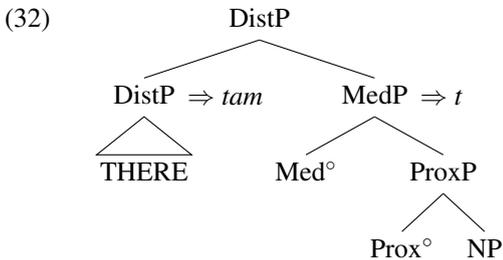
In contrast to *tu* 'here', *tam* 'there' cannot serve as a free form reinforcer placed after the distal demonstrative pronoun *tamto*:

- (30) (a) tamto (\*tam) dziecko  
 DIST<sub>N,NOM</sub> there child<sub>N,NOM</sub>  
 intended 'that there child'
- (b) tamtej (\*tam) dziewczynie  
 DIST<sub>F,DAT</sub> there girl<sub>F,DAT</sub>  
 intended 'to that there human'
- (c) tamtego (\*tam) chłopaka  
 DIST<sub>M,GEN</sub> there boy<sub>M,GEN</sub>  
 intended 'of that there boy'

Moreover, Polish *tam-to* looks like the reinforcer-demonstrative pattern that we find for instance in Afrikaans, where the reinforcer forms a prefix to the demonstrative in front of the head noun, as in:

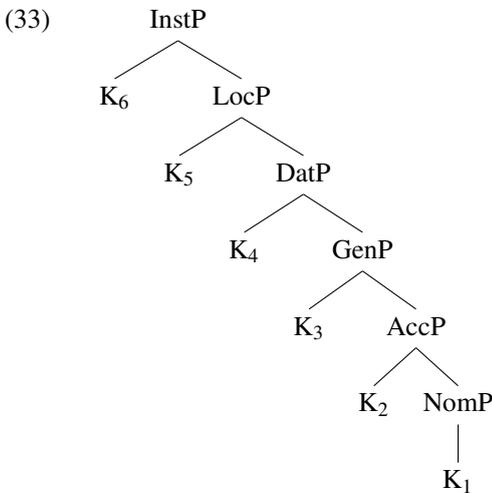
- (31) Afrikaans (Roehrs (2010: 226–227))  
 hier-die mooi meisie  
 here.this pretty girl  
 'this pretty girl'

We can therefore quite safely conclude that the structure of the Polish distal demonstrative comprises the distal locative adverb *tam-* 'there', which is prefixed onto the *t-* stem, which spells out the medial:



Note that it is *to* but not the Polish distal *tamto* or the Russian proximal *èto* that forms the stem for the merger of the *wh*-prefix in *č-to*. Since *t-* spells out the medial in both Polish and Russian, it shows that it is MedP of (32) that the *wh*-feature merges with in Polish and Russian forms for ‘what’. (Nevertheless, what is more important to the following discussion than the fact that it is precisely the MED layer that forms a basis for the merger of the *wh*-feature is the observation that Polish and Russian demonstratives comprise a (pro)nominal base topped with the spatial deictic structure of some degree of complexity and case).

In order to represent how case becomes spelled out as morphology on Polish and Russian demonstratives, let us assume that the lexical entry of neuter nominative suffix that we find in *t-o* includes a case feature  $K_1$ , in line with Caha’s (2009) case decomposition, where cases are decomposed into multiple features as in (33), where accusative corresponds to  $K_1+K_2$ , genitive to  $K_1+K_2+K_3$ , etc.

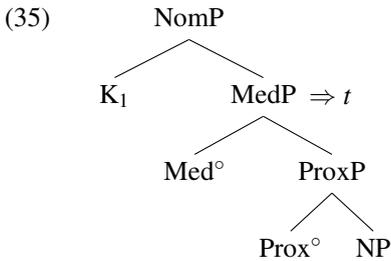


In line with (33), the lexical entry of the neuter nominative looks like in:<sup>13</sup>

<sup>13</sup>On the proviso that the gender feature, which (non-exclusively) determines the declension class in Polish and Russian, is specified for the case sequence. The most realistic description of gender sensitivity in case declension classes is the inclusion of gender features at the bottom of the case sequence in (33). Such a scenario, if it is on the right track, predicts that cases will spell out not only K-features but also gender features under phrasal spell-out. For instance, an exponent spelling out nominative of the masculine declension class will spell out a lexical entry corresponding to  $M+K_1$ , an exponent of the accusative in the feminine declension will spell out  $F+K_1+K_2$ , etc.

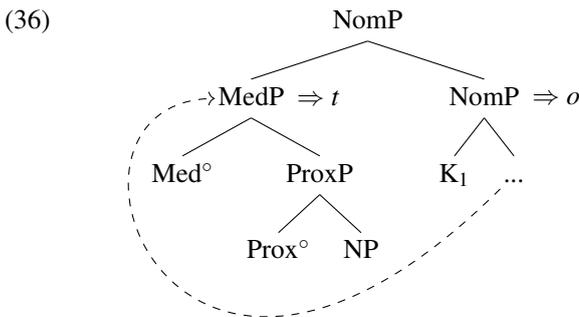
- (34) Lexical entry in Russian and in Polish  
 [ K<sub>1</sub> ] ⇔ -o

However, the merger of the case feature K<sub>1</sub> on top of the demonstrative (medial) stem *t-* as in:



does not result in an immediate spell-out since such a tree does not match any existing lexical entry in Polish or Russian.

Since the newly merged feature K<sub>1</sub> cannot be spelled out in a tree like above, the evacuation movement of MedP takes place in an attempt to form a subtree which will match a lexical entry with K<sub>1</sub>, as in:



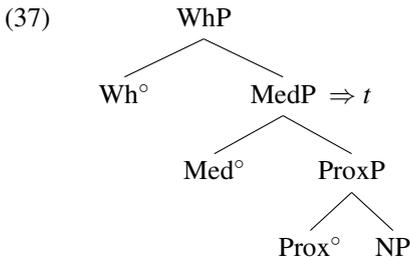
The evacuation of MedP results in the formation of a tree which matches the lexical entry in (34) and whose exponent comes out as a suffix. Note that this kind of spell-out driven movement, where the complement node of the feature requiring to be spelled out becomes evacuated, is what we observe in (13), where the movement of ProxP *ngile-* facilitates the spell-out of MedP and results in *-cha* surfacing as a suffix.

4. Polish *c-* vs. Russian *č-*

So far we have seen two ways in which a feature can get spelled out after it is merged in a syntactic tree: without spell-out driven movement or following spell-out driven movement. Let us discuss both options in some detail.

The merger of a feature in a tree will lead to an immediate spell-out if the lexicon contains an entry which matches that tree structure. To voice it differently, a syntactic representation will stay as is if it can be spelled out in that way. We have seen a merger of a feature followed by an immediate spell-out in demonstratives in Japanese in (11) and in English in (23) where the mergers of  $\text{Med}^\circ$  and  $\text{Dist}^\circ$  on top of  $\text{ProxP}$  both create lexicalizable nodes. Likewise, we have seen it in Polish in (35) where *t-* spells out a monotonically growing sequence of layers of the demonstrative stem up to  $\text{MedP}$  without a prior movement of any node. In this way the option ‘stay’ is the basic spell-out option in the lexicalization procedure.

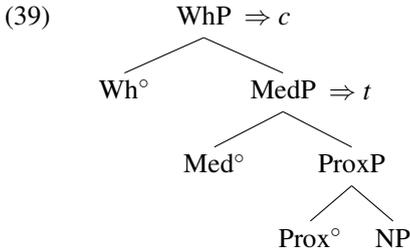
Let us here observe that all we need do to explain why in contrast to Russian *č-t-o* ‘what’, Polish *c-o* does not comprise the medial *t-* morpheme is to recognize how this basic option ‘stay’ applies in spelling out the *wh*-feature. Let us, thus, backtrack in the derivation of the Polish demonstrative to a point where the case inflection is not yet projected on its top, the stage shown in (37), and the uninflected stem merges with the *wh*-feature.



At this point, the spell-out of the newly merged *wh*-feature is attempted and the lexicon is checked for a lexical entry containing the following structure:

- (38) Lexical entry in Polish  
 [ Wh° [ Med° [ Prox° NP ]]]  $\Leftrightarrow c-$

If (38) is stored in the Polish lexicon, the tree with *wh*-feature becomes spelled out right away, as shown in:



The spell-out of the WhP as *c*- overrides the earlier spell-out of the medial stem *t*- in the same way as in the Japanese example in (11) *a*- overrides *so*-, which overrides *ko*-.

If the ‘stay’ option fails, that is when a tree with a newly merged feature does not match an existing lexical entry, the tree must be reshaped and the attempt to spell it out is repeated. This is exactly what we see in (36) when *K*<sub>1</sub> is merged after a successful spell-out of MedP. But what happens if both these options fail to spell-out a newly merged feature?

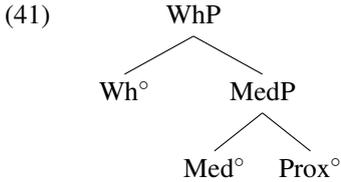
In such a case, Starke (2018) proposes that a third option kicks in, whereby a derivation of a parallel subtree with the feature that remains to be spelled out is created and subsequently merged with the mainline derivation. Starke (2018) argues that spawning a subderivation is a costly operation, as it essentially involves backtracking in the mainline derivation and starting deriving a parallel tree. For this reason, it is a last-resort option employed only when two earlier options do not lead to spell-out, which renders (a simplified) order of procedures that facilitate spell-out as in:<sup>14</sup>

- (40) Spell-out algorithm  
*stay* → *move* → *subderive*

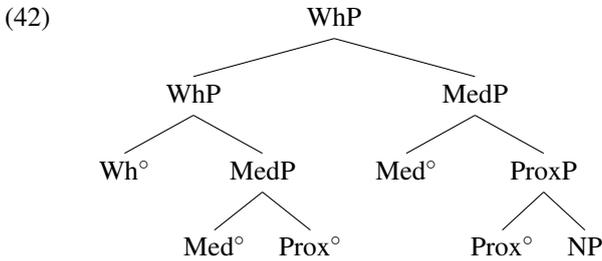
In order to spawn such a subderivation, what needs to be provided is a feature from the mainline derivation, which serves as a base for the merger of subsequent features in the functional sequence up to the one that needs to be spelled out. In the example we are looking at, let us (for now) simply assume that the feature that is provided as the base for spawning the subderivation is the lowest deictic feature Prox°. As before, the next feature in line that merges with Prox° is Med°,

<sup>14</sup>Two familiar kinds of spell-out driven movement have been so far proposed in work on Nanosyntax: a successive-cyclic movement of the previously moved node (‘spec-to-spec’) and the movement of the complement node of the feature that is to be spelled out (‘snowballing’). The order in which these two kinds of movement apply in an attempt to facilitate spell-out is beyond the point of this paper and I will therefore simply refer to them jointly as ‘move’ in what follows.

which creates the base for the merger of  $Wh^\circ$ , which gives us the following tree structure:



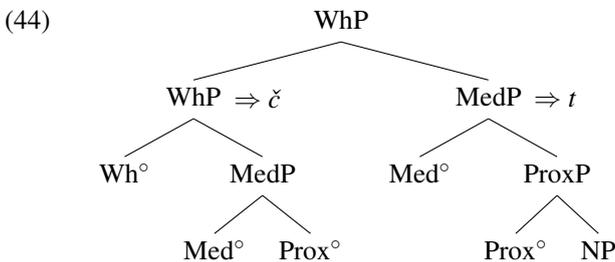
Once the mainline derivation has projected up to MedP, the subderived tree in (41) is closed in, forming a left branch to the mainline derivation, as in:



At this point, spell-out is attempted again and the lexicon is checked for lexical entries that match the structure in (42). If the following lexical entry

- (43) Lexical entry in Russian  
 $[ Wh^\circ [ Med^\circ Prox^\circ ] ] \Leftrightarrow \check{c}$ -

is stored in the Russian lexicon, then the derived tree in (42) is spelled out to the effect that  $\check{c}$ - comes out as the prefix and the stem  $t$ - is preserved in the surface morphological representation, as shown in:



In this way the difference between the *wh* morphology in the Polish *c-o* and the Russian *č-t-o* reduces to the fact that the spell-out of *c-* over-rides the previous spell-out of the *t-*stem in Polish while the spell-out of *č-* in Russian does not.

One consequence of the methodology applied in explaining the contrast between *co* and *čto* is that, as pointed out in Starke (2018), the difference between ‘pre-’ elements and suffixes can be defined representationally such that prefixes have a binary and suffixes a unary foot.<sup>15</sup> For instance, the *č-*prefix in (44) has a binary foot, while the neuter nominative suffix in (36) has a unary foot at the point of spell-out (on the proviso that spell-out driven movement does not create a trace node, the supposition that is informed by the fact that such movements do not reconstruct).

Two remarks about the lexicalization mechanism discussed so far must be made at this point.

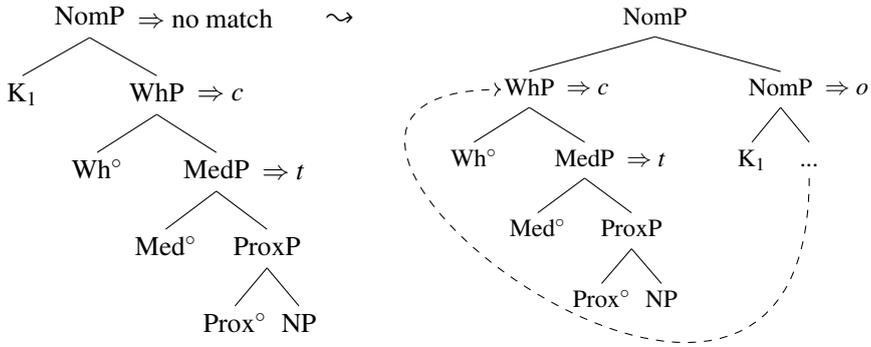
First, a subtree such as *WhP* in (42) becomes a head (in the sense that it projects its own label) once it is closed in with the mainline. More perspicuously, an *XP* that forms a left branch is not a (non-projecting) specifier of its sister node and, instead, it provides its own label to the mainline in the same way as a simplex *Wh*<sup>o</sup> head does in (37).<sup>16</sup> In this way, the attested functional sequence ‘*KP* > *WhP* > *MedP* > *ProxP* > *NP*’ is exactly the same in Russian and in Polish irrespective of morphological complexity of the lexical items that realize this sequence.

Second, after each successful spell-out, the application of the algorithm in (40) repeats. Once the case feature *K*<sub>1</sub> is merged on top of the *wh*-stem, ‘stay’ is attempted. If ‘stay’ fails to result in spell-out, ‘move’ applies, which is what we observe in the derivation of case-inflected Polish *c-o* and Russian *č-t-o*, as illustrated in (45) and (46).

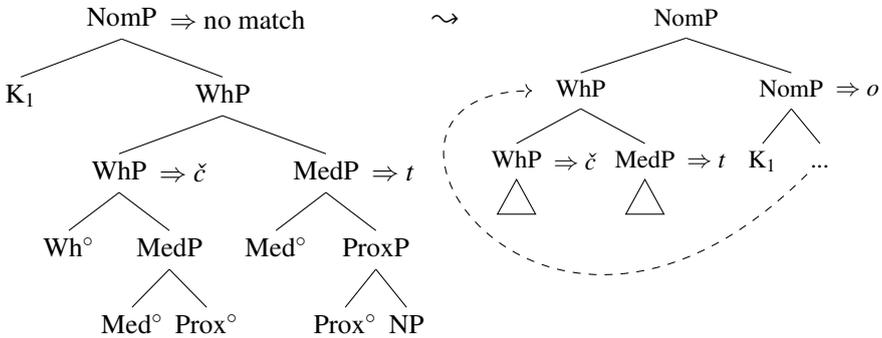
(45) Spelling out nominative *K*<sub>1</sub> in Polish *c-o*

<sup>15</sup> ‘Pre-’ elements include prefixes and prepositional elements like negation markers, particles, auxiliaries or complementizers since there is no relevant derivational contrast between morphologically bound and free morphemes. That is, a syntactic derivation of a morphologically free complementizer and a prefix is the same in the sense that these elements form complex left branches.

<sup>16</sup> An empirical case for phrasal nodes acting as heads of a syntactic sequence is made in Endo and Wiland (2014), where it is shown that Japanese aspectual verbs inside multiple verb complexes form a sequence which is a mirror image of a sequence formed in Polish by aspectual prefixes. Given that Japanese clause structure involves roll-up, which results in a superficial head-finality of Japanese, both the verbs inside verbal complexes in Japanese and prefixes in Polish form the same sequence of aspectual heads.



(46) Spelling out nominative  $K_1$  in Russian *č-t-o*



In the context of case-inflected *čto*, *co* ‘what’ and *kto* ‘who’, let us point out that throughout Slavic, non-nominative forms of *wh*-pronouns like e.g. the Polish *cz-ego* ‘what-GEN’, *k-omu* ‘who-DAT’, etc. do not have the *t*-stem in their morphological structures, as shown for the Polish *kto* in:

- (47)
- |          |       |
|----------|-------|
| NOM      | k-t-o |
| ACC/GEN  | k-ogo |
| DAT      | k-omu |
| LOC/INST | k-im  |

Given the case hierarchy in (33), the *t*-stem in *wh*-pronouns disappears in cases that are higher than nominative. For this reason, what we can call here ‘the disappearing *t*-stem problem’ appears to be an effect of spell-out driven operation that leads to the lexicalization of cases higher than nominative rather than a phonological process of [t] deletion. In this paper, I will not discuss this is-

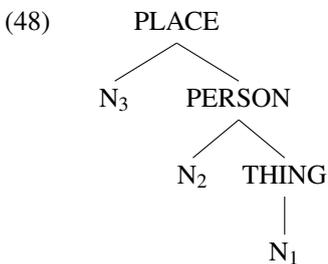
sue in any greater detail and I will instead continue to describe the structure of the *t*- stem in the nominative forms, a necessary step before an analysis of the 'disappearing *t*- stem problem' can be worked out.

### 5. Nominal base in wh-pronouns

An immediate consequence of the lexicalization system in which the formation of a prefix requires spawning a subderivation is that its feature composition is sensitive to the feature composition of the main projection line. This is due to the fact that, as illustrated on the example of the Russian prefix *č*- above, in order to start a subderivation, a feature from the mainline needs to be provided. I will argue below that this is what is reflected in the contrast between the Russian *č*- in *č-t-o* 'what' and the Russian/Polish *k*- in *k-t-o* 'who', where *č*- and *k*-realize different syntactic trees whose feature compositions are determined by syntactically different, although syncretic, *t*- stems they merge with.

The fact that kind and person wh-pronouns have structurally different stems is clearly visible in languages that show an opposite pattern to Russian or Polish, the one where an invariant wh-prefix merges with non-syncretic stems, as for instance in Germanic (e.g. the English *wh-at*, *wh-o*; the German *w-as*, *w-er*; or the Norwegian *hv-a*, *hv-em*). The third logical pattern, the one where the exponents of both the wh-prefix and the stem are syncretic, is also attested. We find it for instance in Latvian, where *k-as* is a syncretic form for 'what' and 'who', while other wh-pronouns such as *k-ur* 'where', *k-ā* 'how', and *k-āpēc* 'why' indicate that the *k*- is a wh-prefix.

There exists evidence for the decomposition of the 'NP' base in wh-pronouns as in (48), where  $N_n$  stand for features that cumulatively form a monotonically growing sequence of nominal categories in pronouns denoting THING ('what'), PERSON ('who'), and PLACE ('where').



The argument for such a sequence can be inferred from Baunaz and Lander's (2018) work on the so-called ontological categories, a closed class of cross-

linguistically attested functional nouns comprising, among others, THING, PERSON, and PLACE, MANNER, AMOUNT, and TIME, which are found in certain defined morpho-syntactic environments, including interrogative pronouns.<sup>17</sup> On the basis of their syncretism and morphological inclusion, Baunaz and Lander arrange the list of the ontological nouns that are discussed in Cysouw's work (2004) on the typology of wh-pronouns into a sequence which includes 'PLACE > PERSON > THING'.

Assuming the \*ABA generalization about syncretic alignment, PERSON is an intermediate category in terms of structural complexity with respect to a bigger PLACE and a smaller THING. As shown in (49), we can observe this on the example of the Latvian *kas*, which shows the THING=PERSON syncretism to the exclusion of PLACE and, as reported in Baunaz and Lander (2018), Awa Pit (Barbacoan), which shows the PLACE=PERSON syncretism to the exclusion of THING (assuming that *m̄in*= and *m̄in* as described in Curnow's work (2006: 225) can be taken to be indeed syncretic).

|      |             |       |        |       |     |
|------|-------------|-------|--------|-------|-----|
| (49) |             | PLACE | PERSON | THING |     |
|      | English:    | where | who    | what  | ABC |
|      | Latvian:    | kur   | kas    | kas   | ABB |
|      | Awa Pit:    | m̄in= | m̄in   | shi   | AAB |
|      | unattested: |       |        |       | ABA |

As noted in Baunaz and Lander (2018), the PLACE=THING syncretism to the exclusion of PERSON is cross-linguistically unattested.

In turn, the morphological inclusion of THING in the structure of PERSON in wh-pronouns is reported to be morphologically visible for instance in Muna (Austronesian) and Amuecha (Arawkan), as in:

<sup>17</sup>See also Cinque (2008), (2016), who shows that the so-called headless relative clauses are in fact not 'headless' but are headed by either abstract or lexically realized ontological nouns denoting 'thing', 'person', 'place', 'time', etc. This can be illustrated for overt 'thing' in Gungbe in (i) or 'person' in Gengbe in (ii).

- (i) Gungbe (Cinque (2016: 3) attributed to E. Aboh (p.c.))

Nú d̄ě à ná mì wè n̄ǎ yí  
**thing** REL 2SG give 1SG FOC 1SG.FUT take  
 'I will take whatever you give me.'

- (ii) Gengbe (Huttar et al. (2013: 118) as cited in Cinque (2016: 3))

Ame-ke gbe dzi be ye la ple gb̄o, yi-na asi ya me  
**person**-REL ever desire COMP 3SG FUT buy giat go-CNT market that in  
 'Whoever wants to buy goats comes to this market.'

- (50) Muna (Van den Berg (1989: sec. 8.6.2) as cited in Baunaz and Lander (2018: 11))  
 (a) hae THING  
 (b) la-hae PERSON
- (51) Amuecha (Wise (1986: 573) as cited in Cysouw (2004))  
 (a) es THING  
 (b) es-eša PERSON

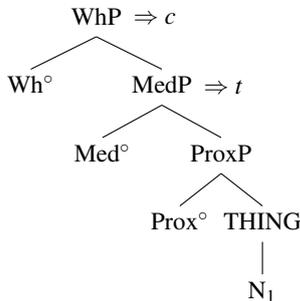
The containment of PERSON in the structure of PLACE is morphologically visible in Sanumá (Yanomaman) and Pipil (Uto-Aztecan):

- (52) Sanumá (Borgman (1990: 67,70))  
 (a) witi PERSON  
 (b) witi ha PLACE
- (53) Pipil (Campbell (1985: 114))  
 (a) ka: PERSON  
 (b) ka:n PLACE

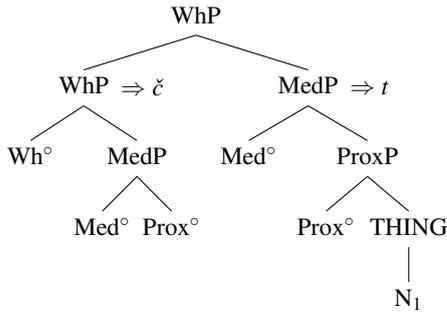
Such morphological forms can be derived if the syntactic representations they realize include the sequence ordered as in (48).

Together with the decomposition of spatial deixis as in (10) and the projection of the WhP layer on its top, the refined structures of the Polish *co* and the Russian *čto* look as in (54a) and (54b)(modulo the case suffix).

- (54) (a) Polish *c-* in *co* 'what' (final approximation)



(b) Russian *č-* in *čto* ‘what’ (final approximation)



With refined representations of *co* and *čto*, let us move on to the *k-* prefix in the Russian/Polish *kto* ‘who’.

## 6. *K-* in *kto*

Descriptively speaking, the juxtaposition of *kto* ‘who’ and *čto/co* ‘what’ indicates that the person vs. kind contrast is marked on the wh-morpheme such that *k-* marks the person and *č-* and *c-* mark the kind.

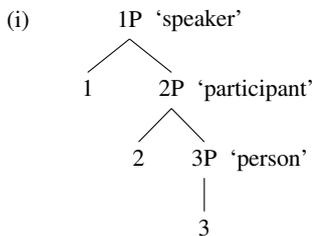
There is caveat to such a description, though, as it presupposes that both *kto* and *čto/co* have an identical stem. If they do, then such a scenario poses a problem for the mechanism of spell-out involving ‘subderive’ since the feature from the mainline that is provided as the base for the subderivation in (54b) is  $\text{Prox}^\circ$ , the feature that gets spelled out jointly with  $\text{Wh}^\circ$  as *č-*, not as *k-*. To restate the problem, if we have a syntactically identical stem in *kto* and in *čto/co*, we are unable to generate the contrast between the wh-exponents *k-* and *č-/c-* and we are unable capture the fact that *k-* is prefixal while the Polish *c-* is not, either.

An immediate attempt to resolve these problems is to assume that the *t-* stems in *čto* and *kto* are syncretic but syntactically distinct, a solution I will consider in what follows. A clue for structural distinction in the stems of kind and person wh-pronouns comes from languages like English where *wh-at* and *wh-o* have non-syncretic stems. If this observation can be extended to the wh-pronouns in Polish and Russian, then the formation of the left branch realized as *k-* in *kto* is going to be spawned by providing a different base feature from the mainline than  $\text{Prox}^\circ$  in (54b).

Such a result can be obtained if, in agreement with the functional sequence given in (48), person queries include a bigger nominal stem than kind queries, as in (55), the structure which serves as the base for the merger of deictic features

and Wh<sup>o</sup>.<sup>18</sup>

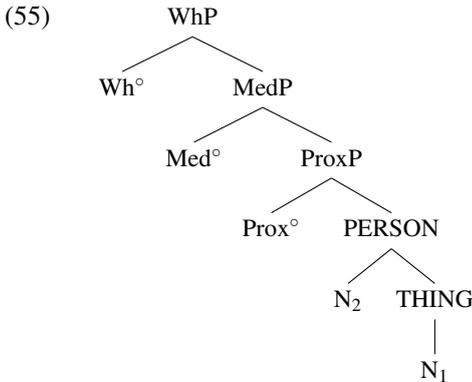
<sup>18</sup>An immediate question such a representation sparks is whether deictic features are projected on top of PERSON just like they are projected on top of THING (as indicated in (54) and elsewhere) and if so, to what extent is the nominal base in *kto* 'who' structurally associated with a personal pronoun? As pointed out in Lander and Haegeman (2016), the tri-partition of spatial deixis into the proximal, the medial, and the distal mirrors the tri-partition of person features into unmarked person (3rd), participant (2nd), and speaker (1st), as in:



In such a decomposition advanced in Bejar (2003) and Vanden Wyngaerd (2018), who follows the description in Cysouw (2003), there are three privative features: 'person', 'participant', and 'speaker'. The 3rd person pronoun consists only of the unmarked 'person' feature, the 2nd person pronoun consists of 'person' and 'participant' features, and the 1st person pronoun consists of all three features.

The internal structures of spatial deixis and personal pronouns share the notions of the unmarked person (or 'speaker/hearer' in description of the distal), the participant (or 'hearer' in the medial), and the speaker. While there are possibly certain other plausible ways of implementing the relation between persons and deictic contrasts (see the relevant discussion in Lander and Haegeman (2016: 13–15)), the most realistic relation between these two categories is (some version of) structural inclusion of the related structures. That is, if the 1st person ('speaker') is contained in the proximal demonstrative pronoun, the resulting structure can be described as 'close to [speaker]'; if the 2nd person ('participant') is contained in the medial demonstrative pronoun, the resulting structure can be described as 'close to [participant]'; if the 3rd (unmarked) person is contained in the distal demonstrative pronoun, the resulting structure can be described as 'far from [person]'.

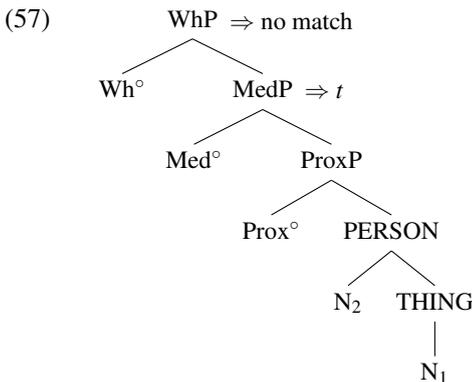
The issue of how much of a personal pronoun is present in the stem of the personal *wh*-pronoun is far from clear at this point. However, it is noteworthy that the morphological structure of the 2nd person singular pronoun in Polish, *ty* 'you.2SG', includes the stem *t-* and the adjectival case suffix *-y* (cf. footnote 11 on exponents of adjectival declension). This *t-* stem is, thus, syncretic with the medial stem in both kind and, as indicated in (55), person *wh*-pronouns, in the way predicted by the description of 2nd person pronouns on the basis of spatial deictic features.



Let us suppose that the lexical entry for *t-* is defined as in (56) and it spells out the MedP node in (55) in both languages (the supposition I will return to shortly).

- (56) Lexical entry in Russian and Polish  
 $[ \text{Med}^\circ [ \text{Prox}^\circ [ \text{N}_2 [ \text{N}_1 ] ] ] ] \Leftrightarrow t-$

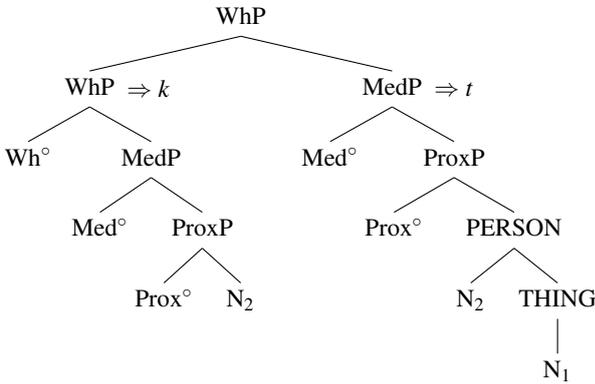
Given that, as shown in (54), the Polish *c-* and the Russian *č-* spell out the WhP nodes that do not include PERSON in their structures, the merger of Wh° on top of MedP in (57) fails to become spelled out by ‘stay’ in both languages.



The next step of the spell-out algorithm in (40), ‘move’ (illustrated for instance in the derivation of the case suffix in (36)), does not result in a successful spell-out either, in which case the wh-marker would come out as the suffix on *t-*, counter fact.

In such case, the last-resort operation, 'subderive', is launched. Unlike in the case of the Russian *čto* as in (54b), there are more possible features in the mainline derivation to be provided as the base to spawn the subderivation. If the base feature that becomes provided is the PERSON-forming  $N_2$ , the feature absent in kind queries but present in person queries, the resulting subtree projected up to  $Wh^\circ$  in (58) is going to have a different foot than both trees lexicalized by  $\check{c}$ - and  $c$ - in (54). (For convenience, let us right away indicate that the subtree forming the left branch in (58) gets spelled out as  $k$ -).

(58) Russian and Polish  $k$ - and  $t$ - in *kto* 'who' (modulo the case suffix)



In order to spell-out the left branch in (58), there needs to be a different lexical entry than for  $\check{c}$ - or  $c$ -, which get inserted in the  $WhP$  nodes in the representations in (54). As already indicated above, the lexically stored tree that can get inserted in the  $WhP$  node in (58) in the spell-out mechanism based on the Superset Principle defined as in (20) is the one in (59), which includes the PERSON-forming feature  $N_2$  in its specification.

(59) Lexical entry in Russian and Polish  
 [  $Wh^\circ$  [  $Med^\circ$  [  $Prox^\circ$  [  $N_2$  ]]]]  $\Leftrightarrow k$ -

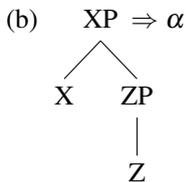
On a final note, let us return to the supposition that the lexical entry for the  $t$ - stem is defined as in (56). With the Superset Principle in (20), which relies on tree structures rather than on feature sets, we are not able to spell-out the  $MedP$  nodes in the representations in (54a)-(54b) as subset spell-outs of (56). This is so since the  $MedP$  nodes in these derivations and the lexical entry for  $t$ - in (56) are not structurally contained. We are, thus, left with  $\check{c}$ - $t$ - $o$  'what' and  $k$ - $t$ - $o$  'who' that have syncretic stems whose syntactic representations differ 'in the middle' (i.e. they are not structurally contained).

One possibility to resolve this problem is to attempt to replace the Superset Principle defined as in (20) with the Revised Superset Principle proposed in Vanden Wyngaerd (2018) and formulated as in:

- (60) Revised Superset Principle (RSP)  
*A lexical entry  $L$  may spell out a syntactic node  $SN$  if and only if the features of  $L$  are a superset of the features dominated by  $SN$ .*

The difference between the RSP and the traditional Superset Principle is that the first does not rely on constituency of the lexically stored tree as a prerequisite on the insertion into a syntactic node and replaces this condition with a feature set of the syntactic node. For example, the RSP allows a syntactic tree in (61b) to be realized by an exponent  $\alpha$  of a lexical item in (61a).

- (61) (a) [ X [ Y [ Z ] ] ]  $\Leftrightarrow \alpha$



Such a result is unobtainable under the classic Superset Principle. Adopting the RSP, we are able to lexicalize the MedP nodes in both *čto/co* ‘what’ in (54) and in *kto* ‘who’ in (57) with the lexical entry for the *t*- stem defined as in (56).

Let us also note that with two separate lexical entries, one for *č*- in (43) and the other for *k*- in (59), we correctly predict the left branch in (54b) to be spelled out by *č*- rather than by *k*-. Despite the fact that the WhP node in (54b) includes a subset of features specified in the lexically stored tree for *k*- in (59), which potentially qualifies for the subset spell-out as *k*- under the RSP, the WhP node in (54b) is lexicalized as *č*-. This is due to the Elsewhere Principle in (21), since the *č*- item in (43) is a better match for the left branch in (54b) than the *k*- item in (59).

Despite the result we can obtain with applying the RSP, there remain certain other options that rely on the classic definition of the Superset Principle to be explored in deriving the *t*- stem syncretism – pointers being an immediate alternative to the RSP (see Caha and Pantcheva (2012) for an illustration of the pointer technology). For this reason, it is safe to conclude that this issue is left only provisionally resolved at this point.

## 7. Summary

In a system of lexicalization like in Starke (2018), a feature that cannot be spelled out in the mainline derivation becomes spelled out in its prefix. I have made a case for this kind of derivational mechanism of prefix formation by arguing that it accounts for the contrast between the forms of Russian and Polish lexical items for ‘what’: *čto* and *co*. I have then explored the possibility that in such a system, the feature composition of a stem provides an insight about the feature composition of its prefix.

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