Linguistic Annotation of the National Corpus of Polish

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NKJP

FDSL 9

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National Corpus of Polish (12.2007–06.2011)

Pol. *Narodowy Korpus Języka Polskiego* (NKJP).

Institutions:

- Institute of Computer Science PAS (Warsaw; PI: Adam Przepiórkowski; coordinator) — cf. the IPI PAN Corpus of Polish;
- Institute of Polish Language PAS (Cracow; PI: Rafał Górski);
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- University of Łódź (PI: Barbara Lewandowska-Tomaszczyk) — cf. the PELCRA Corpus of Polish.

Some features:

- 1.5 billion words,
- 250-million-word balanced subcorpus,
- 1-million-word balanced subcorpus manually corrected,
- multiple levels of annotation.

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Balancing act

Aim for the **readership**-balanced subcorpora:

- 50%: journalism, including:
  - dailies (51% of journalism),
  - magazines (47%),
  - journalistic books (2%);
- 16%: fiction literature (prose, poetry, drama),
- 5.5%: non-fiction literature,
- 5.5%: instructive writing and textbooks,
- 2%: academic writing and textbooks,
- 4%: miscellaneous written (legal, advertisements, user manuals, letters) and unclassified written;
- 7%: internet (forums, chatrooms, mailing lists, etc.);
- 10%: spoken, including:
  - conversational,
  - spoken from the media,
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Classification also according to channels (press, book, spoken, etc.) – see Górski and Łaziński 2011a,b in the forthcoming NKJP book.

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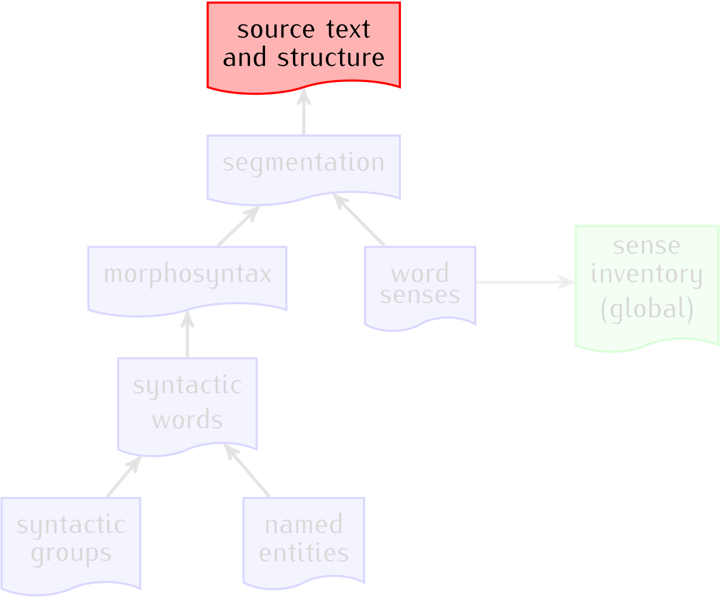

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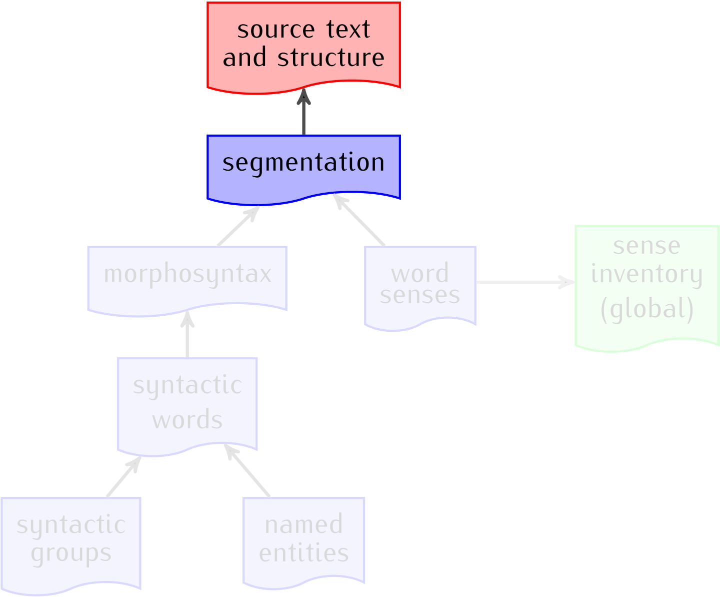

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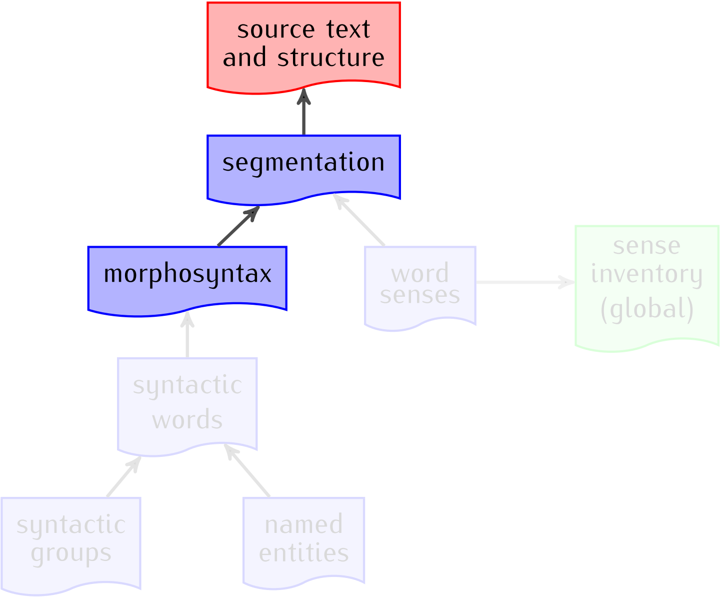

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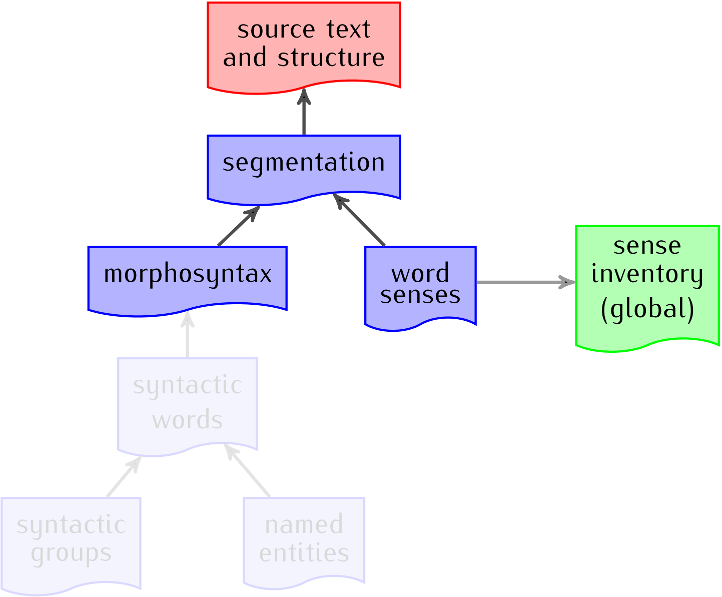

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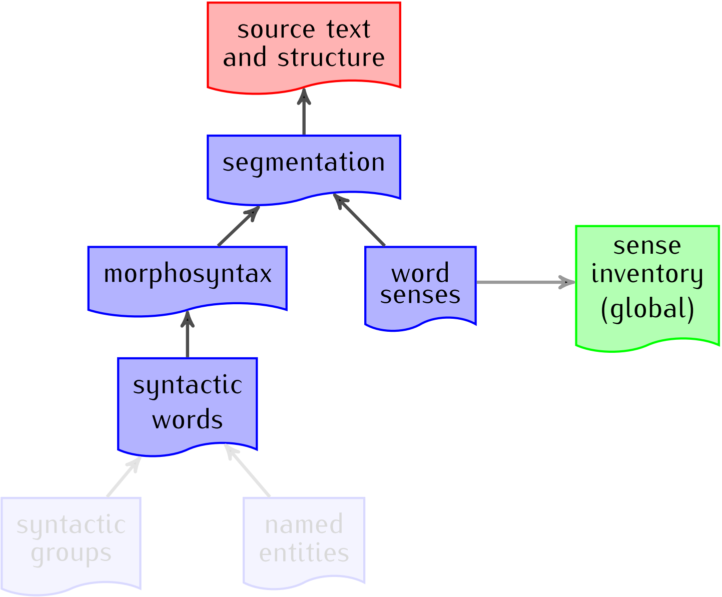

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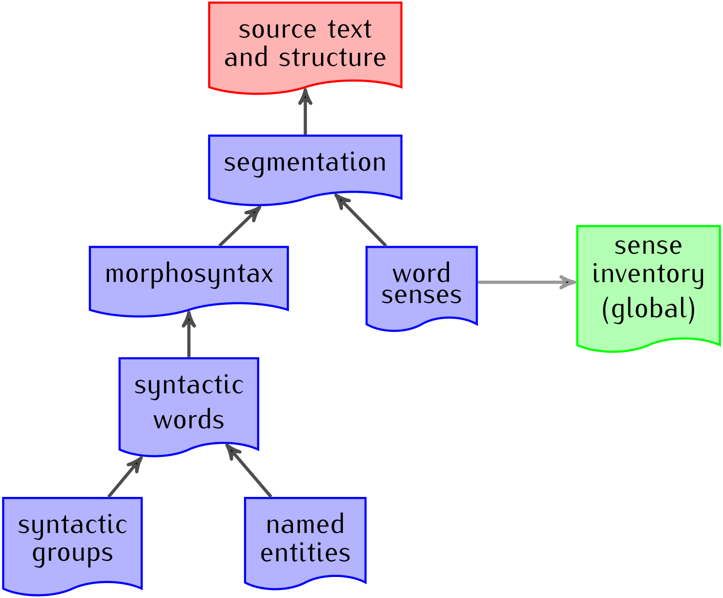

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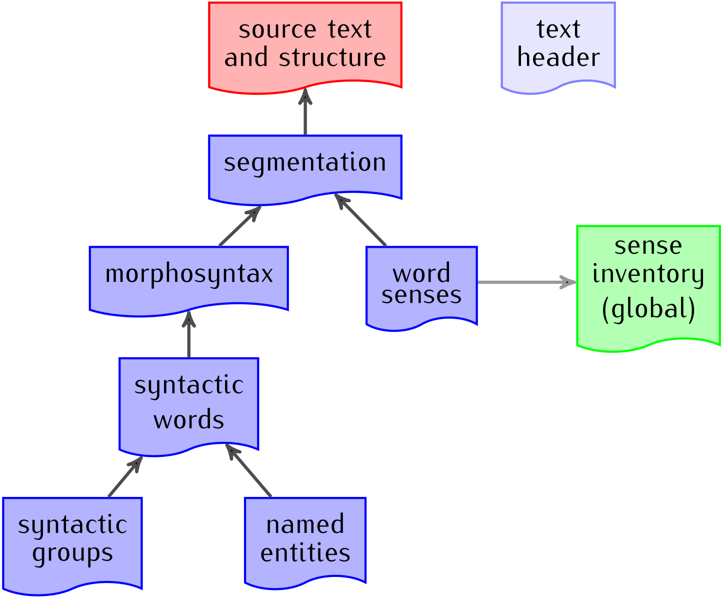

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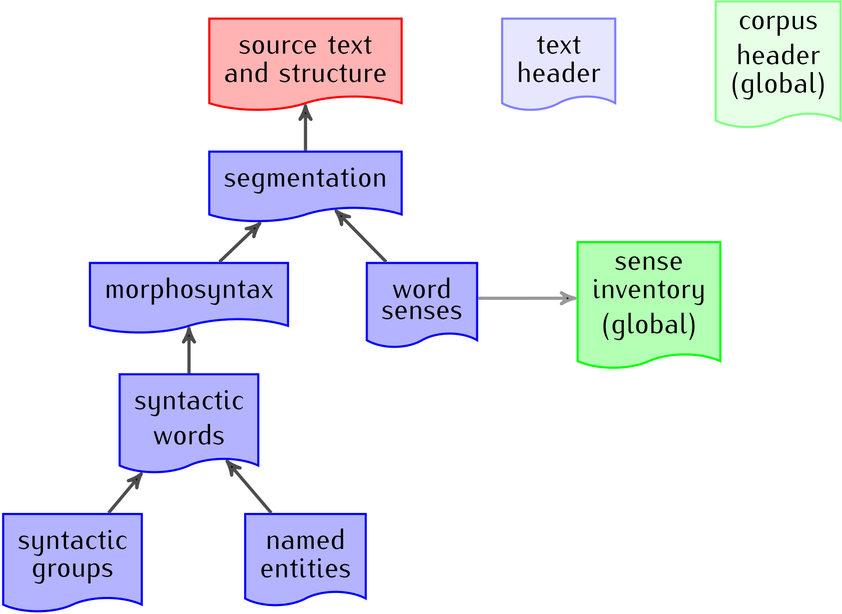

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1. **Sentence-level segmentation**
   - mostly straightforward,
   - when in doubt, prefer longer sentences, e.g.:

‘Chodź	tu!’	– powiedział	Janek.
come	here	said	Janek

2. **Word-level segmentation**
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Segmentation 2

Some consequences:

- 5 segments (including punctuation):

Będę	szedł	i	gwizdał.
will.1.SG	walk	and	whistle

- 4 segments:

Gwizdalibyśmy.
Gwizdali|by|śmy|.
we would (have) whistle(d)

because:

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long–1.PL	whistle.PAST

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Word Senses

Rather preliminary work:

- a little over 100 lexemes,
- all very frequent and homonymous,
- split into coarse-grained meanings.

Treated as empirical material for testing Word Sense Disambiguation systems, rather than as a full-fledged annotation level.

More: papers by Kopeć, Młodzki and Przepiórkowski in Slavicorp 1 publication (special issue of *Prace Filologiczne*, 2012) and in the forthcoming NKJP book.

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Morphosyntax 1

Each segment annotated with:

- lemma,
- grammatical class (roughly, part of speech),
- appropriate grammatical categories (case, gender, etc.).

A conservative modification of the IPI PAN Tagset
(cf. Przepiórkowski 2004, 2009).

Preserved:

- flexemic approach to grammatical classes (36),
- detailed grammatical categories,
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- accomodability: *dwaj (faceci)* vs. *dwóch (facetów)* in the subject position (i.e., both supposedly nominative).

Morphosyntax 3

Examples:

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	`subst:sg:nom:n`
	`subst:sg:acc:n`
	`subst:sg:voc:n`
siane	`ppas:sg:nom:n:imperf:aff`
	`ppas:sg:acc:n:imperf:aff`
	`ppas:pl:nom:m2:imperf:aff`
	. . . (10 interpretations altogether)
śmy	`aglt:pl:pri:imperf:nwok`
jego	`ppron3:sg:gen:m1:ter:akc:npraep`
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Unlike word-level segments:

- may overlap,
- may be non-contiguous.

Motivation:

- “traditional” words (including analytic forms, reflexive verbs, etc.),
- mediation between fine-grained word-level segmentation and syntax proper.

For example, the two reflexive verbs in:

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- recognition of basic NPs, PPs, etc.,
- without resolving attachment ambiguities,
- or necessarily constructing full trees (a separate treebank project is running now).

Syntactic groups:

- are annotated for syntactic and semantic heads,
- and group type.

More on syntactic words and groups: Głowińska and Przepiórkowski 2010 and papers by Katarzyna Głowińska in Slavicorp 1 publication and in the forthcoming NKJP book.

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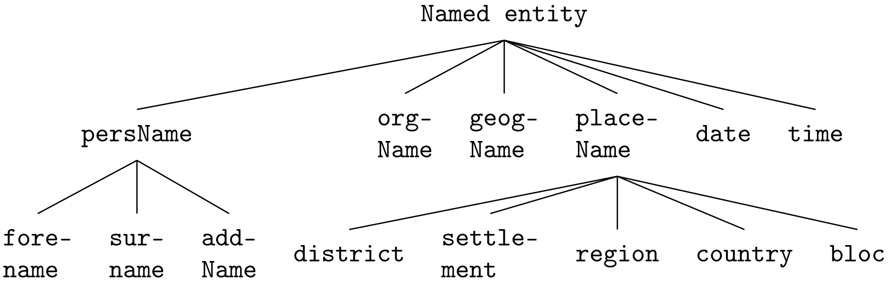

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More on NEs: Savary *et al.* 2010 and papers co-authored by Agata Savary in the forthcoming NKJP book.

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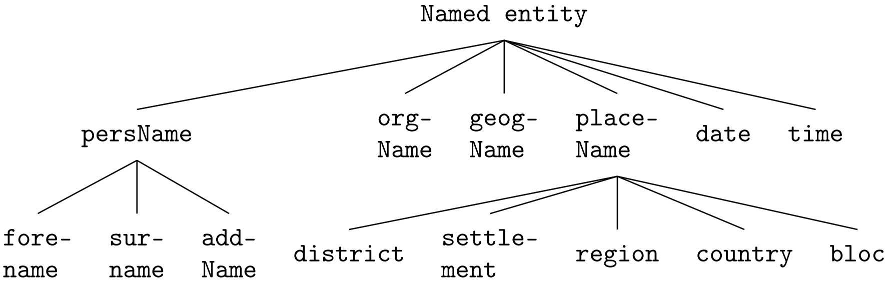

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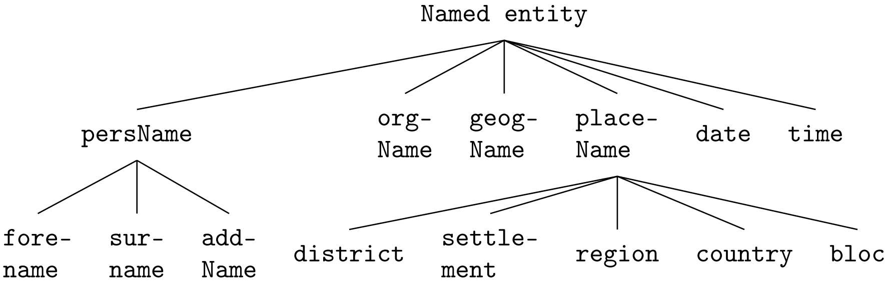
More on NEs: Savary *et al.* 2010 and papers co-authored by Agata Savary in the forthcoming NKJP book.

Named Entities



Named Entities may:

- be non-contiguous,
- overlap,
- be nested.

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Manual annotation (morphosyntax) 1

Texts are morphologically analysed by Morfeusz (Woliński, 2006; Saloni *et al.*, 2007), which also provides word-level segmentation, but:

- Morfeusz assigns all possible morphosyntactic tags, to be disambiguated manually,
- there are omissions,
- there may be errors (even when only one tag assigned).

So, for each segment, the annotator:

- selects the right lemma and tag, if it's among those proposed,
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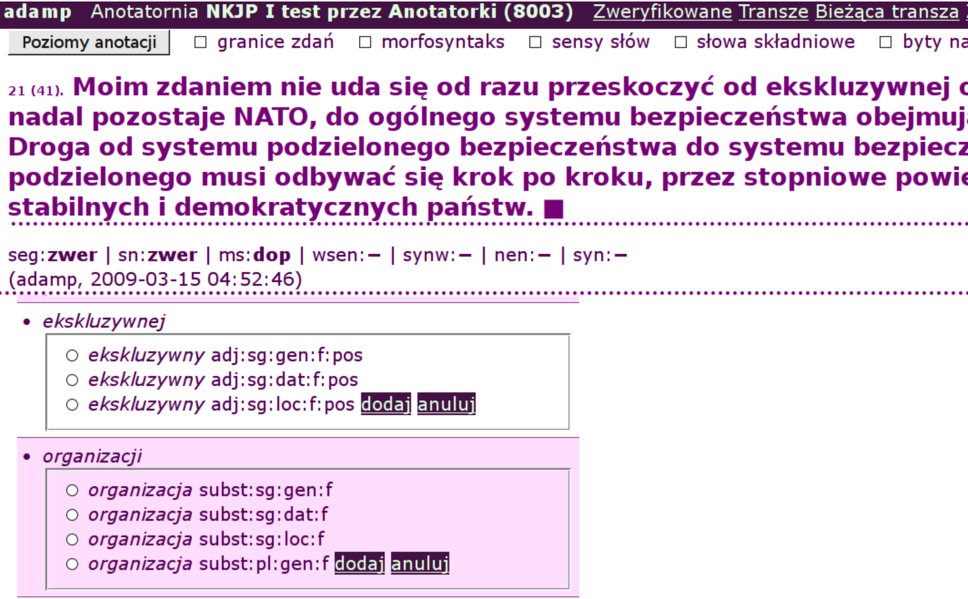

adamp Anotatornia **NKJP I test przez Anotatorki (8003)** Zweryfikowane Transze Bieżąca transza

Poziomy anotacji □ granice zdań □ morfosyntaks □ sensy słów □ słowa składniowe □ byty na

21 (41). **Moim zdaniem nie uda się od razu przeskoczyć od ekskluzywnej o nadal pozostaje NATO, do ogólnego systemu bezpieczeństwa obejmuj Droga od systemu podzielonego bezpieczeństwa do systemu bezpiecz podzielonego musi odbywać się krok po kroku, przez stopniowe powie stabilnych i demokratycznych państw.** ■

seg:**zwer** | sn:**zwer** | ms:**dop** | wsen:**–** | synw:**–** | nen:**–** | syn:**–**
(adamp, 2009-03-15 04:52:46)

- *ekskluzywnej*
  - ○ *ekskluzywny* adj:sg:gen:f:pos
  - ○ *ekskluzywny* adj:sg:dat:f:pos
  - ○ *ekskluzywny* adj:sg:loc:f:pos dodaj anuluj
- *organizacji*
  - ○ *organizacja* subst:sg:gen:f
  - ○ *organizacja* subst:sg:dat:f
  - ○ *organizacja* subst:sg:loc:f
  - ○ *organizacja* subst:pl:gen:f dodaj anuluj

Manual annotation (morphosyntax) 2

At each level:

- annotation is introduced independently by two annotators,
- if they fully agree:
  - the annotation is accepted and
  - the paragraph is sent to the next level of annotation (by the same annotators),
- otherwise the annotators are informed:
  - about the existence and location of the discrepancy,
  - but not about the annotation of the other annotator,
- and they may change their own annotation or stick to it;
- after this round, if there still is a conflict:
  - it must be resolved by the super-annotator,
  - the annotatation guidelines should be modified accordingly.

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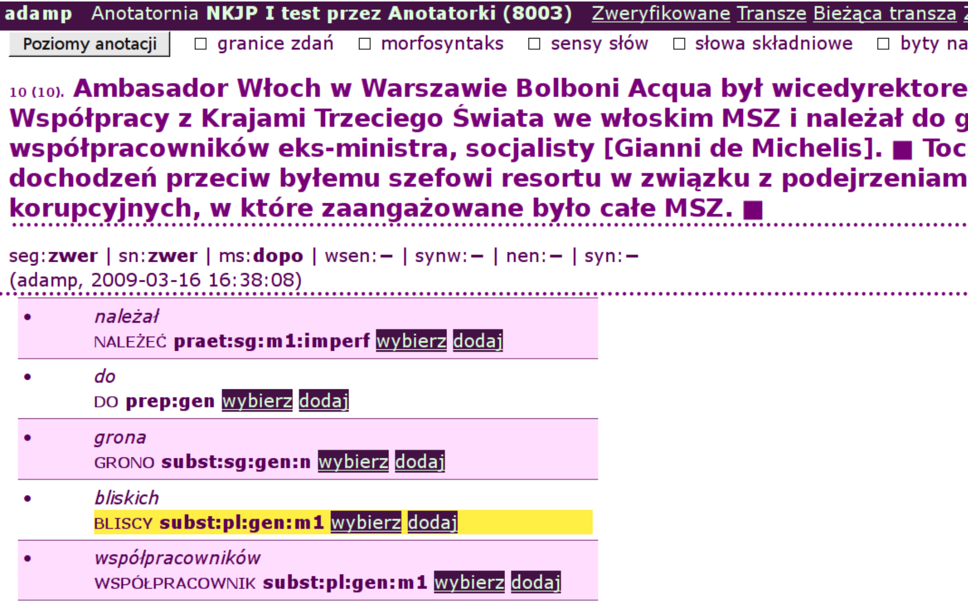
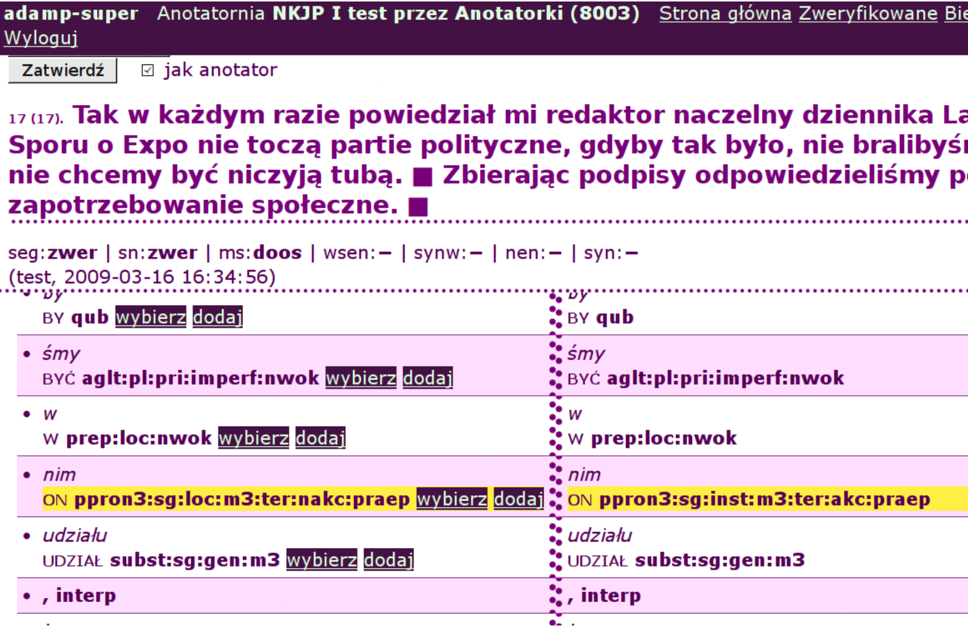


adamp Anotatornia **NKJP I test przez Anotatorki (8003)** Zweryfikowane Transze Bieżąca transza Z

10 (10). **Ambasador Włoch w Warszawie Bolboni Acqua był wicedyrektore Współpracy z Krajami Trzeciego Świata we włoskim MSZ i należał do g współpracowników eks-ministra, socjalisty [Gianni de Michelis]. ■ Toc dochodzeń przeciw byłemu szefowi resortu w związku z podejrzeniam korupcyjnych, w które zaangażowane było całe MSZ. ■**

seg:**zwer** | sn:**zwer** | ms:**dopo** | wsen:**–** | synw:**–** | nen:**–** | syn:**–**
(adamp, 2009-03-16 16:38:08)

- *należał*
  NALEŻEĆ **praet:sg:m1:imperf** wybierz dodaj
- *do*
  DO **prep:gen** wybierz dodaj
- *grona*
  GRONO **subst:sg:gen:n** wybierz dodaj
- *bliskich*
  BLISCY **subst:pl:gen:m1** wybierz dodaj
- *współpracowników*
  WSPÓŁPRACOWNIK **subst:pl:gen:m1** wybierz dodaj



adamp-super Anotatornia **NKJP I test przez Anotatorki (8003)** Strona główna Zweryfikowane Bie
Wyloguj

Zatwierdź ☑ jak anotator

17 (17). **Tak w każdym razie powiedział mi redaktor naczelny dziennika La**
Sporu o Expo nie toczą partie polityczne, gdyby tak było, nie bralibyś
nie chcemy być niczyją tubą. ■ Zbierając podpisy odpowiedzieliśmy p
zapotrzebowanie społeczne. ■

seg:**zwer** | sn:**zwer** | ms:**doos** | wsen:**–** | synw:**–** | nen:**–** | syn:**–**
(test, 2009-03-16 16:34:56)

• *by* BY **qub** wybierz dodaj	*by* BY **qub**
• *śmy* BYĆ **aglt:pl:pri:imperf:nwok** wybierz dodaj	*śmy* BYĆ **aglt:pl:pri:imperf:nwok**
• *w* W **prep:loc:nwok** wybierz dodaj	*w* W **prep:loc:nwok**
• *nim* ON **ppron3:sg:loc:m3:ter:nakc:praep** wybierz dodaj	*nim* ON **ppron3:sg:inst:m3:ter:akc:praep**
• *udziału* UDZIAŁ **subst:sg:gen:m3** wybierz dodaj	*udziału* UDZIAŁ **subst:sg:gen:m3**
• **, interp**	**, interp**

XML representation 1

NKJP

How to represent linguistic information in texts?

- XML (obviously),
- the Text Encoding Initiative P5 standard (Burnard and Bauman, 2008):
  - extensively documented (including semantics of elments),
  - very rich (also metadata),
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An example for *Bał się odezwać* at the level of syntactic words on the next slide.

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```
<seg xml:id="word13">
 <fs>1</fs> <!-- (see below) -->
 <ptr target="ann_morphosyntax.xml#seg17"/> <!-- Bał -->
 <ptr target="ann_morphosyntax.xml#seg18"/> <!-- się -->
</seg>
<seg xml:id="word14">
 <fs>2</fs> <!-- (see below) -->
 <ptr target="ann_morphosyntax.xml#seg18"/> <!-- się -->
 <ptr target="ann_morphosyntax.xml#seg19"/> <!-- odezwać -->
</seg>
```

Where:

- $\boxed{1} = \begin{bmatrix} \textit{word} & \\ \textsc{orth} & \text{Bał się} \\ \textsc{base} & \text{bać się} \\ \textsc{ctag} & \text{Verbfin} \\ \textsc{msd} & \text{sg:ter:m1:imperf:past:ind:aff:refl} \end{bmatrix}$
- $\boxed{2} = \begin{bmatrix} \textit{word} & \\ \textsc{orth} & \text{się odezwać} \\ \textsc{base} & \text{odezwać się} \\ \textsc{ctag} & \text{Inf} \\ \textsc{msd} & \text{perf:aff:refl} \end{bmatrix}$

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Some applications

NKJP

- 1-million-word manually annotated subcorpus: training and evaluating various tools (also LREC 2012 Language Library);
- new Polish dictionaries:
  - eponymous phrases – published (Czeszewski and Foremniak, 2011),
  - general dictionary – in preparation (Żmigrodzki *et al.*, 2007);
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NKJP

```
[orth="wieczorem|rankiem] [pos=conj]
[pos=adj & case=acc]* [pos=subst & case=acc]
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Trudno w to dziś uwierzyć, ale ten grysik jadłyśmy ***wieczorem i cały następny dzień****.*

```
[base=być & pos="fin" & pers="pri|sec"]
[pos=subst & case~~nom]
```

To prawda, że ***jesteś hycel****…*

To ja ***jestem policja****.*

…ale ja, Wincenty Korab Czartkowski, szlachcic i obywatel, ***jestem władza nad władzą****,* ***jestem principium wszelkiej władzy****,* ***jestem filar społeczeńskiego ładu i porządku****!*

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Future (starts today) 1

Some resources and research based on NKJP at IPI PAN:

- *Składnica* – the first Polish constituency treebank (`http://zil.ipipan.waw.pl/Składnica`);

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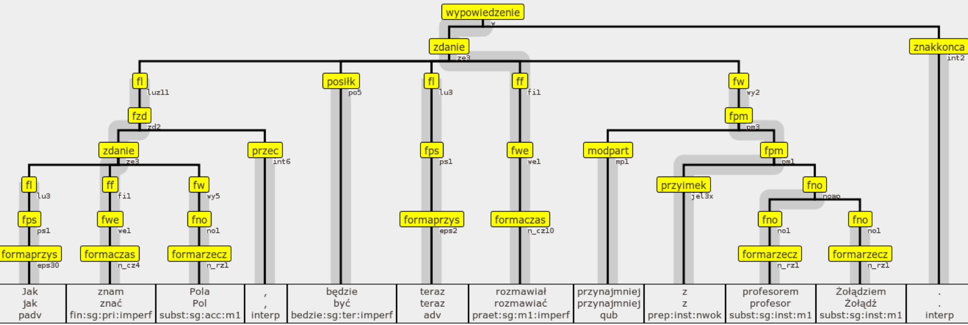
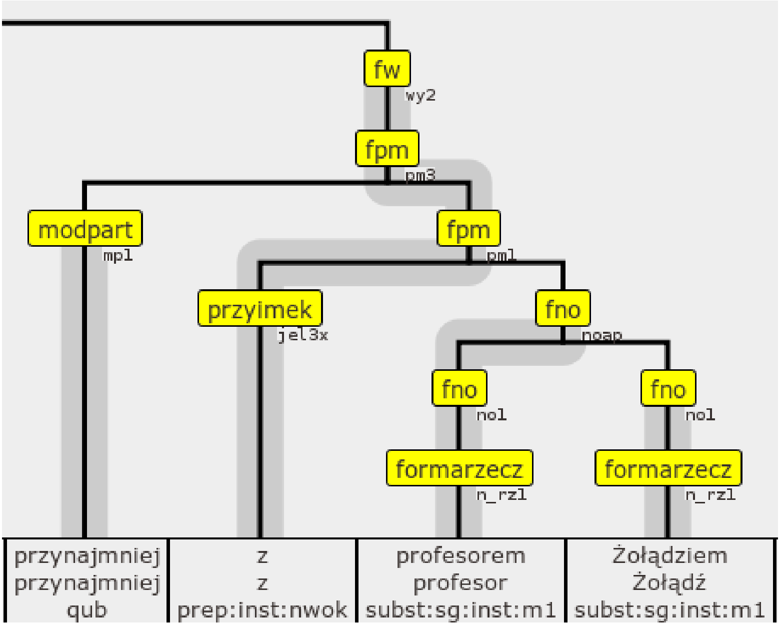


Future (starts today) 2



przynajmniej	z	profesorem	Żołądziem
przynajmniej	z	profesor	Żołądź
qub	prep:inst:nwok	subst:sg:inst:m1	subst:sg:inst:m1

Future (starts today) 3

- also a dependency version (same address);

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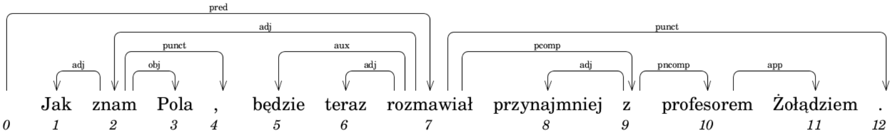
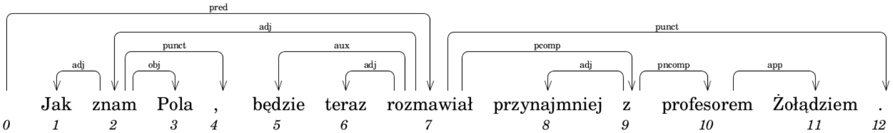


Jak znam Pola , będzie teraz rozmawiał przynajmniej z profesorem Żołądziem .

0 1 2 3 4 5 6 7 8 9 10 11 12

Future (starts today) 3

- also a dependency version (same address);


pred
adj
punct
adj
punct
aux
pcomp
obj
adj
adj
pncomp
app
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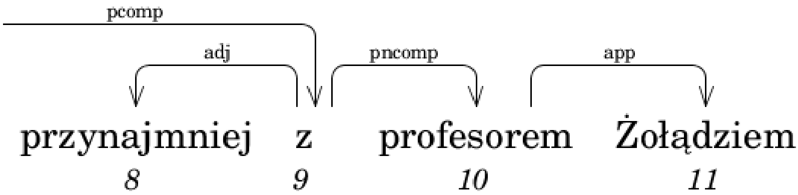
0 1 2 3 4 5 6 7 8 9 10 11 12



Future (starts today) 4

- a Lexical-Functional Grammar based on the constituency grammar, but with:
    - control and raising,
    - case assignment based on the structural / lexical case dichotomy,
    - negative concord, etc.

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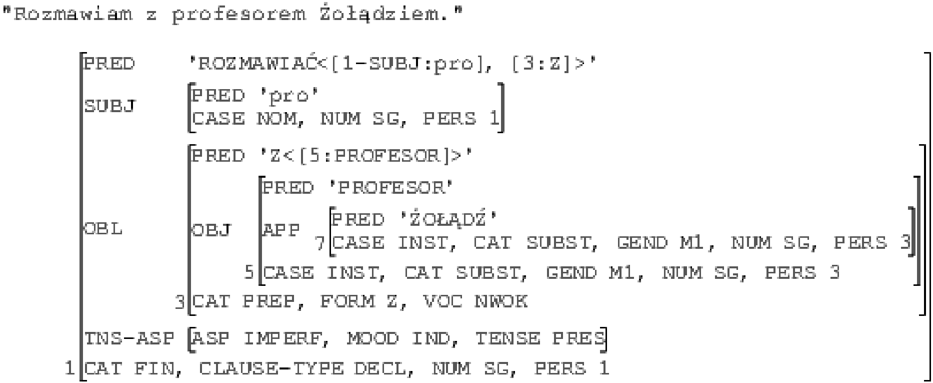

```
"Rozmawiam z profesorem Żołądziem."

  PRED     'ROZMAWIAĆ<[1-SUBJ:pro], [3:Z]>'
  SUBJ     [PRED 'pro'                  ]
           [CASE NOM, NUM SG, PERS 1    ]
           [PRED 'Z<[5:PROFESOR]>'
           [        PRED 'PROFESOR'
  OBL      [OBJ     APP   [PRED 'ŻOŁĄDŹ'
           [              7 CASE INST, CAT SUBST, GEND M1, NUM SG, PERS 3
           [      5 CASE INST, CAT SUBST, GEND M1, NUM SG, PERS 3
           3 CAT PREP, FORM Z, VOC NWOK
  TNS-ASP  [ASP IMPERF, MOOD IND, TENSE PRES]
1 CAT FIN, CLAUSE-TYPE DECL, NUM SG, PERS 1
```

Thank you for your attention!

`http://nkjp.pl/`

NKJP

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