

Interoperability of Second Language Resources and Tools

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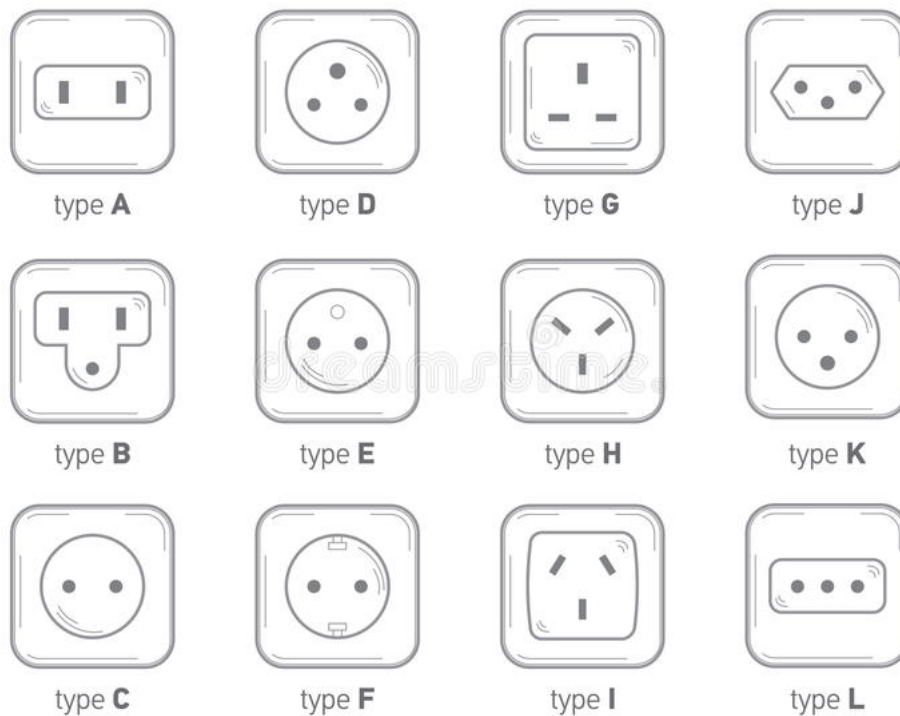
What is **Interoperability** (of Language Resources) ?

Ideal picture



What is **Interoperability** (of Language Resources) ?

Real-life picture



What is **Interoperability of Language Resources** ?

by Chiarcos, 2012

- Structural
 - **Annotations** of different origin are represented using the same formalism (e.g. stand-off XML or RDF databases)
- Conceptual
 - **Annotations** of different origin are linked to a common vocabulary (terminological reference repository)

Chiarcos, C. (2012). Interoperability of corpora and annotations. In *Linked Data in Linguistics*. Springer.

What is **Interoperability of Language Resources** ?

by Foulonneau & Riley, 2014

- **Metadata**

- Descriptions of the data; resource discovery in search engines, portals and registries. (+filtering?)

- **Technical**

- Data aggregation

- **Content**

- Comparable content of the resources – based on metadata

Foulonneau, M., & Riley, J. (2014). *Metadata for digital resources: implementation, systems design and interoperability.* Elsevier.

What is **Interoperability of Language Resources** ?

by Ide & Pustejovsky, 2010

- Metadata
 - characteristics of data expressed through a set of labels (syntactic dimension) and categories (semantic dimension)
- Data categories and their semantics
 - e.g. morpho-syntax, syntax, text typologies, etc.
- Requirements for publication of data and notations
 - common practices for creating, documenting and evaluating language resources, e.g. agreement on formats and access; encoding; copyright; etc.
- Requirements for software sharing
 - software formats, data formats, software integration platforms; possibility to combine different tools; evaluation of software; copyright

Ide, N., & Pustejovsky, J. (2010). What does interoperability mean, anyway? Toward an operational definition of interoperability for language technology. In *Proceedings of the Second International Conference on Global Interoperability for Language Resources*.

Interoperability of Second Language Resources and Tools

Ide, N., & Pustejovsky, J. (2010).

- Metadata
- Error taxonomies
- Tools
- User interfaces

Workshop on Interoperability of Second Language Resources and Tools

6-8 Dec. 2017 | University of Gothenburg, Sweden

<https://sweclarin.se/swe/workshop-interoperability-l2-resources-and-tools>

CONTRIBUTION TO CLARIN GOALS

- Promotion of the interoperability of resources and tools in CLARIN by working towards common guidelines for L2 annotation and metadata
- Promotion of the integration of data, tools and services making L2 corpora compatible with corpus tools in CLARIN
- Creating and expanding the CLARIN network of experts in the area of L2 corpora and tools

INVITED TALKS and main program points

Towards standardization of metadata for L2 corpora:
Sylviane Granger, University of Louvain, Belgium

Program in a nutshell:

- Existing corpora
- Corpora under construction
- L2 infrastructures
- Metadata and ethics
- Error annotation
- Tools and software
- Happy user
- Developments on top of L2 corpora
- Discussion à la World café
- Social program

Participants and organizers

Organizers:

- Elena Volodina, Sweden
- Kari Tenfjord & Silje Ragnhildstveit, Norway
- Therese Lindström Tiedemann, Finland
- Nives Mikelić Preradović, Croatia
- Maarten Janssen, Portugal

Participants:

15 countries; 27 participants



L2 metadata

by Granger and Paquot, 2017

- Administrative
 - title, license, availability, ...
- Corpus design
 - L1s, L2s, size, mode, levels, guidelines, ...
- Annotation
 - type: POS, syntax, errors; tagsets, guidelines, tools, ...
- Text
 - mode, author, title, statistics, task types & instructions, ...
- Learner
 - age, gender, L1s, L2s, level, education, ...

Granger, S., & Paquot, M. (2018). *Towards standardization of metadata for L2 corpora.* Presentation at the workshop on Interoperability of Second Language Resources and Tools. Gotheburg, Sweden, Dec 2017.

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L2 metadata

in present-day LCR projects

- Varied between L2 corpora
 - no track of various aspects, e.g. Tasks, guidelines, etc
- Restricted by laws and agreements
 - e.g. aggregated birth year spans in one corpus *versus* exact birth year in another
- Incompatible
 - e.g. Bosnian, Serbian and Croatian L2s separate in one corpus *versus* BSC in another

Granger, S., & Paquot, M. (2018). *Towards standardization of metadata for L2 corpora*. Presentation at the workshop on Interoperability of Second Language Resources and Tools. Gotheburg, Sweden, Dec 2017.

Examples: *Korp, Swedish edition*

KORP SW1203-uppsatser selected — 51.97K of 13.26G tokens

Simple Extended Advanced Compare

Filter: Type: C: Slutprovsuppsats and Proficiency Level: C1 B2 and Add native language

gender is Kvinna

or

and

lemgram is barn (noun)

or

↓ and

Search within sentence

KWIC: hits per page: 25 sort within corpora: not sorted Statistics

KWIC Statistics Word picture

Results: 6

« < 1 > » Go to page of 1 Show context

De måste aktivt använda barn att...

Mång föräldra tror att tvåspråkiga barn...

Orsaken till detta är att...

Särskilt i Afrika finns det många språk som är hotade eftersom folkgrupper lever i Sverige till exempel har...

KORP TISUS-texter selected — 59.64K of 13.26G tokens

Simple Extended Advanced Compare

written proficiency is 5

written proficiency is 4

or

and

gender is Kvinna

or

✓ Afrikaans

Azerbaijani

Bulgarian

Croatian

Czech

Dutch

English

Estonian

Finnish

French

Galician

German

Greek

Hungarian

Italian

Japanese

Korean

Latvian

Lithuanian

Mandarin Chinese

Polish

Portuguese

Russian

Serbian

Serbo-Croatian

Spanish

Swedish

KWIC: hits per page: 25 sort within corpora: not sorted Statistics

KWIC Statistics Word picture

Results: 6

barn att...

barnet.

barn eller...

barn för a...

barn har...

barn i Sve...

Error taxonomy

an ideal

- Same error classification approach across L2 corpora
 - e.g. based on linguistic description (phonology, orthography, morphology, ...) (Dobrić 2015)
- Same granularity
 - 22 tags versus 65 tags
- Theory-independent approach
 - (Tenfjord et al 2006)
- Piloting
 - test on project members first to avoid unreliable / confusing tags
- Annotation
 - e.g. normalization first, error code afterwards (Volodina et al. 2018)
- Annotation quality
 - documented inter-annotator agreement, etc. (Fort 2016)

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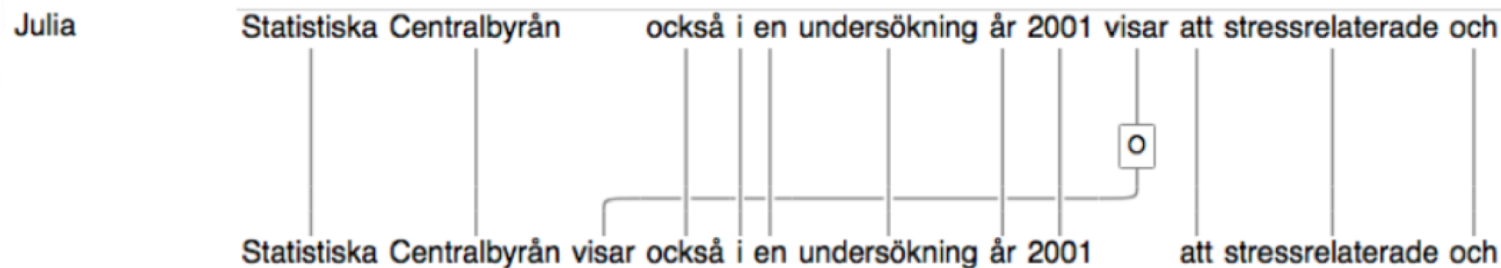
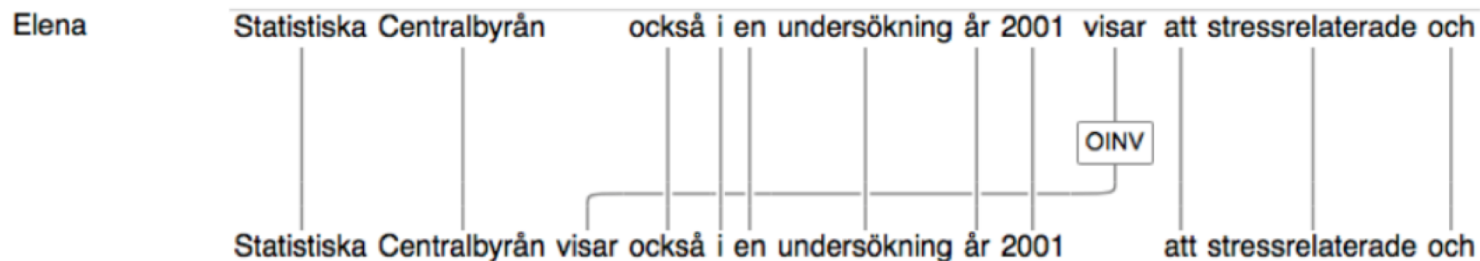
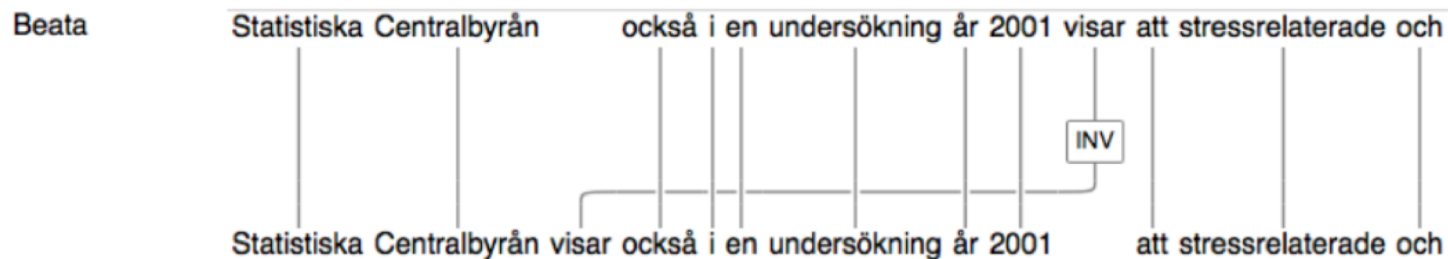
Error taxonomy

in present-day LCR projects

Taxonomies are like underwear; everyone needs them, but no one wants someone else's.

(From a presentation by Egon Stemle at CLARIN workshop on interoperability of L2 resources and tools)

Example: ASK taxonomy in SweLL pilot



Gloss: Central Statistical Agency [...] also in a report from 2001 [*shows (finite verb)*] that stress-related and...

Error code explanations: *INV*: Non-application of subject/verb inversion, *OINV*: Application of subject/verb inversion in inappropriate contexts, *O*: other word (or phrase) order error.

Tools

an ideal

- Accessible
- User-friendly
- Well-documented
- Accompanied by user manuals
- Collected in one repository for re-use
- Annotation quality

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Tools

in present-day LCR projects

Pluralism of formats and outputs, often inaccessible, or proprietary.

Some examples:

- Feat (Hana et al 2010)
- TEITOK (Janssen 2016)
- SVALA (Rosén et al 2018)
- Falko-tools (Müller & Strube 2006)

Some tools

SVALA

```
{
  "source": [
    {"id": "s0", "text": "Det "},
    {"id": "s1", "text": "finns "},
    {"id": "s2", "text": "en "},
    {"id": "s3", "text": "tunnelbana "},
    {"id": "s4", "text": ", "},
    {"id": "s5", "text": "heter "},
    {"id": "t26", "text": "Stadsbiblioteket "},
    {"id": "s7", "text": "och "},
    {"id": "s8", "text": "många "},
    {"id": "s9", "text": "buss-stationer "},
  ]
}
```

revert

auto

disconnect

merge

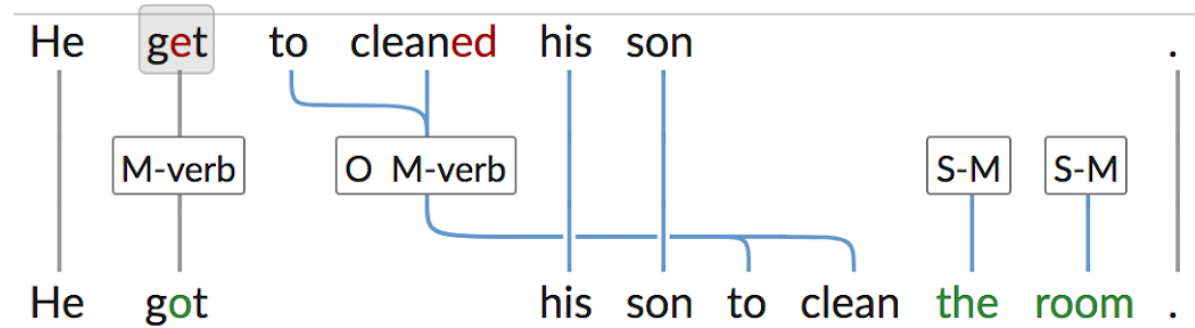
group

deselect

Enter label...

• M-verb

×



```
"edges": {
  "e-t26-t6": {
    "id": "e-t26-t6",
    "ids": ["t26", "t6"],
    "labels": [],
    "manual": true
  },
  "e-s0-t0": {
    "id": "e-s0-t0",
    "ids": ["s0", "t0"],
    "labels": [],
    "manual": false
  },
  "e-s1-t1": {
    "id": "e-s1-t1",
    "ids": ["s1", "t1"],
    "labels": [],
    "manual": false
  },
  "e-s2-t2": {
    "id": "e-s2-t2",
    "ids": ["s2", "t2"],
    "labels": [],
    "manual": false
  }
}
```

Some annotation formats

ASK

<sic type="F" desc="AGR" corr="stilling">stillingen</sic>

<word lemma="dette" features="pron nøyt ent pers @subj">

dette

</word>

User interfaces

an ideal

- Basic and advanced modes
- Selection of error types to be correlated with speaker features
- Metadata re-use & filtering

User interfaces

an ideal

- Basic and advanced modes
- Selection of error types to be correlated with speaker features
- Metadata re-use & filtering

User interfaces

in present-day LCR projects

- Various **formats** exist, but most of the search tools rely on xml format
→ need to have a TEI-conformant version of all corpora
- **Search builder** – varies between interfaces
 - Not all **metadata** is visualized or is made searchable
 - SLA researchers are often “scared”

Some user interfaces



Query interface

Choose Corpus:

Basic search | **Advanced search**

Use this input form to write a textual query.

Query:

Here you can compose a query graphically.

Choose a subcorpus:

Morsmål = "polsk|tysk"

add:

attribute:

Choose positional constraints. ☒ Ignore structural positions

☐ target

Ordklasse = "**"

repetition:

add:

attribute:

struct:

Concordance

Choose Corpus:

Basic search | **Advanced search**

Query:

Hit 1 - 30 of 18907 | | Go to: | Download ☐ Excel ☐ | Type: | Show: ☐ annotation ☐ | Show line filter ☐ | Show:

Choose variable: | Position: | Shortcuts:

count	cpes	Text-id	match	Engelskferdigheter	Morsmål	CEFR
1	620276	s0026	40 år har jeg levd godt uten	<add> <add> tanke <add> om <add> mobiltelefon	grunnnivå	tysk B2
2	260454	h0355	Oppgave D: <add> Stiloppgave <add> fra	<add> <add> "Et møte" <add> <add> D	grunnnivå	tysk A2/B1
3	672246	s0123	Oppgave 1 - <add> om	<add> vennskap <add> <add> <add> <add>	mellemnivå	tysk B2
4	18503	h0027	imparagrafen kan nordmenn få en sjanse <add> for	<add> å forsvare sin kultur og tradisjon bedre,	mellemnivå	tysk C1
5	199532	h0219	Det samme, men <add> har <add> <add>	<add> <add> var det vanlig at absolutt alle ha	høyere nivå	tysk B2/C1
6	162012	h0224	for <add> eksempel <add>, en <add> <add>	<add> dette <add> <add> <add> <add> Van	høyere nivå	tysk B1/B2
7	265025	h0363	<add> <add> Vi må være klare <add> <add> om	<add> <add> at det er en kvantitativ måte ad	mellemnivå	tysk B1/B2
8	277244	h0378	<add> løpe <add> rundt den ovale banen <add> av	<add> is, <add> <add> <add> De utavende er avher	mellemnivå	tysk B2
9	353135	h0478	egen, <add> Konkurransen og <add> krav <add> for	<add> <add> fleksibilitet fører til psykisk stress	mellemnivå	tysk B2
10	421787	h0565	am må <add> stille et seg <add> <add> stå <add> imot	<add> <add> <add> <add> <add> <add> i dag større <add>	mellemnivå	tysk B2

Word List

Choose Corpus:

Basic search | **Advanced search**

Query:

Match size: 18907, unique words or phrases: 202. Attribute:

Page 1 of 1.

3204 (16,95%) i	32 (0,17%) hjem	6 (0,03%) langs	2 (0,01%) vek
2164 (11,45%) på	30 (0,16%) fram	5 (0,03%) pga.	1 (0,01%) Angående
2113 (11,18%) til	30 (0,16%) per	5 (0,03%) unna	1 (0,01%) Bland
2049 (10,84%) for	29 (0,15%) Med	4 (0,02%) angående	1 (0,01%) Eter
1614 (8,54%) med	28 (0,15%) uansett	4 (0,02%) ifra	1 (0,01%) Fram
1599 (8,46%) av	25 (0,13%) imot	4 (0,02%) nedover	1 (0,01%) Får
776 (4,10%) om	24 (0,13%) tross	3 (0,02%) Blant	1 (0,01%) Heretter
536 (2,83%) som	23 (0,12%) Av	3 (0,02%) Hjemme	1 (0,01%) Hos
467 (2,47%) I	23 (0,12%) Om	3 (0,02%) På	1 (0,01%) Iblant
458 (2,42%) fra	23 (0,12%) Som	3 (0,02%) Tross	1 (0,01%) Inntil

Text

Choose Corpus:

Display:

Query

Concordance

Collocations

Distribution

Word List

Text

Overview

Variables

Oppgave C

Norge er en av landene som har ledige arbeidsplasser. De finnes ikke nok nordmenn for alle stillingene særlig når det gjelder helsepersonell og ingeniører. Sykepleierne og legene gjør en veldig viktig, ansvarlig og tung jobb, men betaling for denne jobben er ikke så høy. Det kan være grunn til at mennesker vil ikke jobbe i såne yrker.

Norge er nødt til å hente arbeidskraft fra utlandet. Landet vil ikke fungere bra hvis det blir stort arbeidsledighet. Utvikling av landet blir hindret. Det er ikke positivt for Norges økonomi. I dag er det viktig å konkurrere med andre land, men det blir ikke mulig hvis Norge blir rammet av arbeidsledighet.

Jeg tror at det tiltak er også mulighet for mennesker som kan komme til Norge for å jobbe. Kanskje de har problemer med å finne en jobb i sitt eget land. Så det er et fantastisk gjensvar for å skaffe seg et bedre liv. Noen ganger går det på bekostning av familie og venner som de må forlate.

Det at Norge kommer folk fra mange forskjellige land er veldig bra for norske folk. De kan være kjent med andre kulturer, andre religioner. Kanskje de kan finne seg venner.

Integrering er meget viktig for utlendinger. Hvis en skal trives her i Norge må han tilpasse seg det norske samfunnet. Myndighetene og arbeidsgiverne kan gjøre mye på dette området. Noen ganger trengs det å skifte loven, eller å

Prospects

- Non-trivial work, time-consuming, community depending
 - a lá Universal Tagset / Universal Dependencies
- Pluralism (in tools and formats) is healthy, BUT we need a common conversion mechanism, a lá transformers, between the pluralistic approaches
- Need for insights from several perspectives
 - Second Language Acquisition researchers, (learner corpora) linguists, teachers, language testing specialists
 - NLP researchers, software engineers, Systems developers

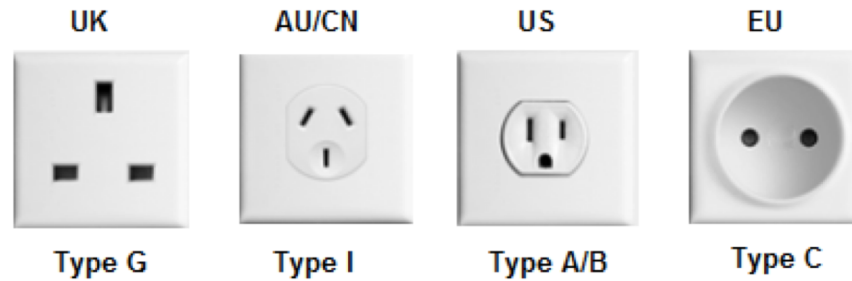
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- **Volodina, E., L. Granstedt, S. Johansson, B. Megyesi, J. Prentice, D. Rosén, C-J. Schenström, G. Sundberg and M. Wirén.** (2018). Annotation of learner corpora: first SweLL insights. *Proceedings of SLTC 2018*.

Thank you!

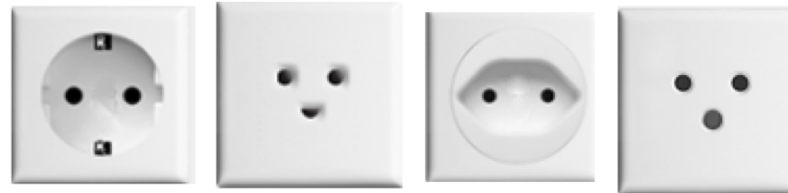


Germany France
Austria, Korea
Netherland Spain
Russia Belgium

Denmark
(happy face)

Switzerland
Italy Brazil
South Africa

Israel



Type C Europlug fits all, more than 130 countries

Our aim →

Follow-up

- **Suggestions for future:** <https://goo.gl/bW24Sq>
- **Joint publication** in LCR 2018 post-conference volume (accepted, publication date 2019):
 - Egon W. Stemle (Italy), Adriane Boyd (Germany), Maarten Janssen (Portugal), Therese Lindström Tiedemann (Finland), Nives Mikelić Preradović (Croatia), Alexandr Rosen (Czech Republic), Dan Rosén (Sweden), Elena Volodina (Sweden). *Working together towards an ideal infrastructure for language learner corpora.*
- **CLARIN survey of L2 corpora:**
 - *L2 learner corpus survey – Towards improved verifiability, reproducibility and inspiration in learner corpus research.* By Therese Lindström Tiedemann, Jakob Lenardič and Darja Fišer. CLARIN 2018
- **COST action:** application is planned
- **Follow-up workshop:** is planned



Some user interfaces

Swedish Korp

Search query & filters

KORP SW1203-uppsatser selected — 51,97K of 13,26G tokens

Single Extended Advanced Compare

Filter: Add type and Add proficiency level and Add native language

A: Inträdesuppsats (1761)
B: Mitterminsuppsats (1801)
C: Slutprovsuppsats (2019)
D: Ömprow (1762)

is

or

and

+

Add token

Generellt för alla uppsatser i SW1203-korpusen

Studenterna skrev i tentasalen.
Inga hjälpmedel var tillåtna.
Tid 3,5 timmar.

SKRIVUPPGIFT: Ett brev till politikerna i kommunen

Du har fått två kladdpapper och ett dubbelvikt ark. Skriv din text först på kladdpapper och sedan sedan resten på det dubbelvikta ark. Kom ihåg att skriva namn och

Task description

Hits in KWIC format

Go to page 1 of 143 Show context

SW1203-uppsatser

Jag gillar mycket min områd där jag bor.
Jag har nu bra tillgång till kollektivtrafik, till exempel bus.
Det finns många busar och spårvagnar på vilka man kan åka.
En viktig del av det är biljetter som jag tycker punktligt mycket om.
Jag är inte nöjd med avfall system.
Jag har lätt i soprum i varje byggnad och de måste vara i stor
antal. Dessutom måste de delas ut ordentligt
Jag är en mycket bra idé att vi får ge en förslag för att förbättra vår k
ttade hit för 4 månader sedan.
ett bo här därför att det finns flera mataffärer i närområdet c
so här därför att det finns flera mataffärer i närområdet och det
h det inte tar lång tid att gå till hållplatsen.
Dessutom finns det en stor skog omkring i vilken man kan pr
i skog omkring i vilken man kan promenera.
In jag inte är så nöjd med.
In kan inte sortera sopor i vår sopstation så att vi bara kan så
ation så att vi bara kan sätta alla sopor i en påse och sedan
att vi bara kan sätta alla sopor i en påse och sedan kastar de

Metadata

Corpus

SW1203-uppsatser

Text attributes

student: I

type: A: Inträdesuppsats

task URL:

http://sprakbanken.gu.se/_TillPolitiker.pdf

C/G: +

A: +

B: +

age: 27

gender: F

native language:

Persian (Dari)

proficiency level: B1

task: Ett brev till politikerna i kommunen

semester: HT12

birth year: 1985

Metadata explanation

Metadata beskrivning för SW1203

Födelseår

1963-1993

Kön

Kvinna, Man

A, B, C (Type)

Uppsatstyper:

A: Inträdesuppsats (52 st)

B: Mitterminsuppsats (41 st)

C: Slutprovsuppsats (45 st)

D: Ömprow (3 st)

Student

Student-id i korpusen (1-84)

Semester

HT12, VT13

Statistics

KWIC Statistics Word picture Graph

Show Trend Diagram Show map

Number of rows: 755

	proficiency level	Total
<input type="checkbox"/> -program		
<input type="checkbox"/> aldrig (adverb)	B0	37 (1)
<input type="checkbox"/> allra (adverb)	C1	18,2 (1)
<input type="checkbox"/> allra (adverb)	B0	51,7 (1)
<input type="checkbox"/> alla (adverb)	C1	77 (1)
<input type="checkbox"/> alla (adverb)	B0	18,2 (1)
<input type="checkbox"/> allt (adverb)	C2	51,7 (1)
<input type="checkbox"/> allt (adverb)	C1	77 (1)
<input type="checkbox"/> allt (adverb)	B0	171,2 (1)
<input type="checkbox"/> allt (adverb)	B0	96,2 (1)
<input type="checkbox"/> alltid (adverb)	C2	51,7 (1)
<input type="checkbox"/> alltid (adverb)	C1	134,7 (1)
<input type="checkbox"/> alltid (adverb)	B0	363,4 (1)
<input type="checkbox"/> alltid (adverb)	B0	230,9 (1)
<input type="checkbox"/> alltid (adverb)	C2	51,7 (1)
<input type="checkbox"/> alltid (adverb)	C1	115,4 (1)
<input type="checkbox"/> alltid (adverb)	B0	151,9 (1)
<input type="checkbox"/> alltid (adverb)	B0	77 (1)
<input type="checkbox"/> all (adverb)	C1	18,2 (1)

Some user interfaces

TEITOK

Editable metadata

KWIC/XML

Search & Filters

Query Builder

Text Search

Written form

Teacher corrected form

Orthographically corrected form

Syntactically corrected form

Lexically corrected form

POS tag

Lemma

Document Search

Nationality

Mother tongue

Proficiency

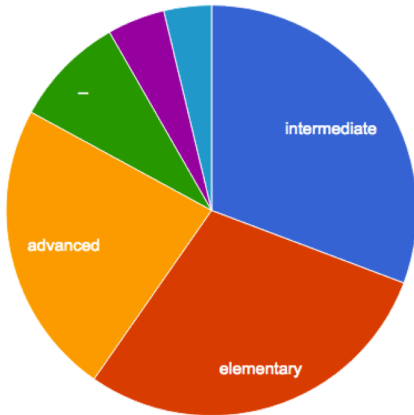
Collection phase

Search query:

Group query: Group by: **Proficiency**

Statistics

Graph: Pie | Count: Count | Download: [select]



Entry exam

Template: [teiHeader-edit.tpl](#)

Text title	Entry exam
Responsibility Statement	Andrej Žešević-Tadić, Luka Dominiković
Project title	
Project language	
Person ID	afr00213
Year of Birth	1996
Sex	
Level of language proficiency for the language being learned	2A
First language	Afrikaans
Foreign languages	
Mother first language	
Father first language	
Stay in Croatia	
Duration of language learning	
Continuing from lower language learning level	
Task ID	2A_00
Task Title	Entry exam
Genre of the task	essay
Extent of the task	10-15 sentences
Type of task	test

Cascais de 05 de Julho de 2010

Caro Nuno,

Tenho sorte de vir para cá, mesmo a vida é muito diferente da nossa, mas gostei de muitas coisas, sobretudo da simpatia do povo português. No sábado conheci a FF e o seu marido, o MM depois de 6 anos de relação virtual.

Levaram-me às praias de Cascais, é muito perto de Lisboa, a praia não é muito grande, a sua areia é dourada, também a água é muito **sana** ?? para banhar-se.

A zona é muitas vezes cheia de turistas, ao andar podes ouvir muitas línguas estrangeiras, grupos de jovens, idosos, casais, surfistas.

Ao nível de vigilância e higiene, há muitas **tropas equipas** de nadadores-salvadores, assegurando a vida **dos pessoas** banhistas. A vida anda muito bem sem conflitos, há uma organização muito cuidado. Com certeza **enviare-te-ei** mais cartas e mais notícias. Aproveita **o teu** tempo também. Na espera **de as** tuas **novidades** espero que tenhas **um** mês tranquilo e cheio de felicidade.

Beijinhos!

Document

[illegible]

What is **Interoperability of Language Resources** ?

by Ide & Pustejovsky, 2010

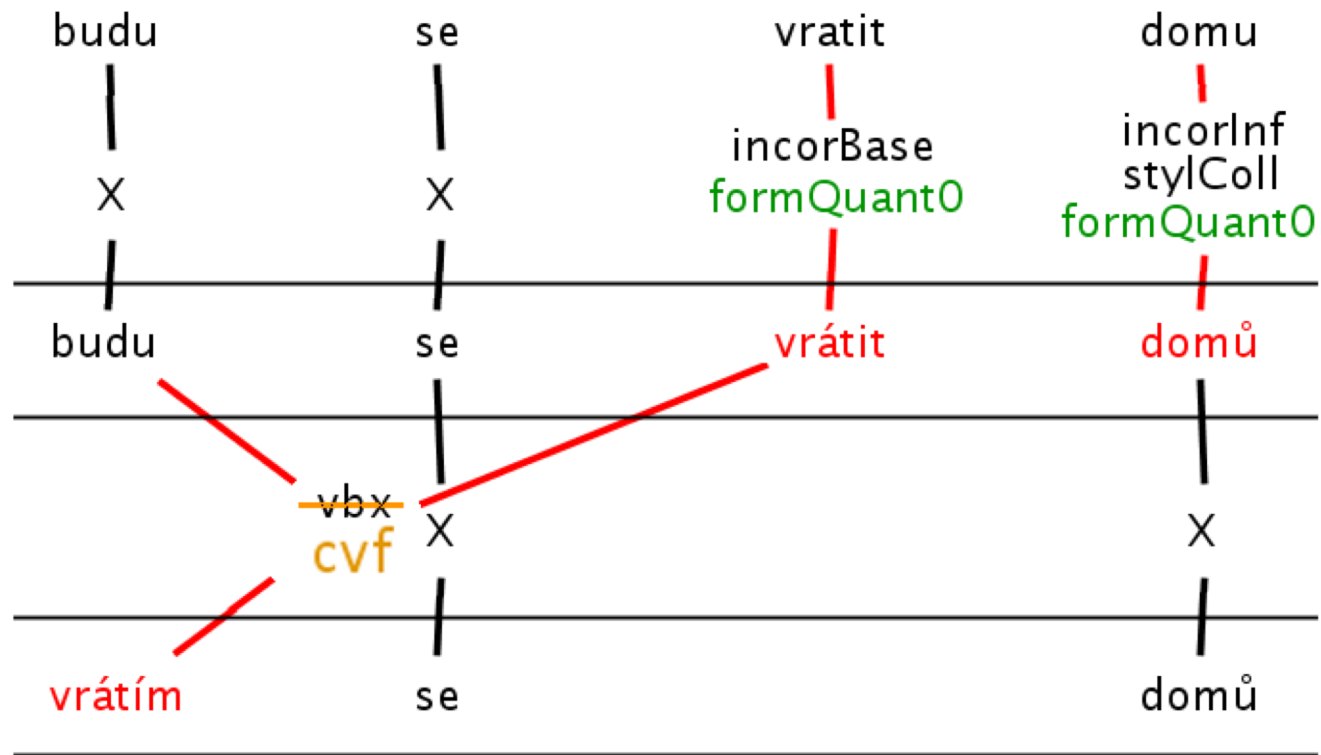
...a measure of the degree to which diverse systems, organizations and/or individuals are able to work together to achieve a common goal.

- For computers
 - **syntactic** interoperability (data formats, communication protocols, data exchange)
 - **semantic** interoperability (ability to automatically interpret exchanged information via a common information exchange reference model)
- For language resources
 - focus is rather on **semantic** interoperability, since syntactic ones are technically mappable via a trivial conversion

Ide, N., & Pustejovsky, J. (2010). What does interoperability mean, anyway? Toward an operational definition of interoperability for language technology. In *Proceedings of the Second International Conference on Global Interoperability for Language Resources*.

Some tools

feat



Some user interfaces

Corpuscle :: ASK Hovedkorpus :: Concordance

Advanced search | [switch to Basic search](#)

[Query history ...](#)

[type = "R|M"] [pos = "det"] \ <> \\ :: language != "norsk"

[Run Query](#)

[Stop](#)

[Saved queries ...](#)

[Save Query](#)

Done. Running time: 2.23 sec. (2.34 CPU sec.)

Hit 1 - 30 of 3611 | [Previous](#) | [Next](#) | Go to: | [Download](#) (☐ Excel mode) | Type: [context](#) | ☐ Show ann

count	cpos	context
1	853	Nettopp denne uken organiserte skolen til barna mine et foreldremøte hvor vi diskuterte undervisningssystem kommet fram med.
3	1267	På { den } _M andre siden {hver {enkelte enkelt } _F av oss forberedet forberedet hver enkelt av oss } _O seg sammen samlet seg for å vente med glede { på } _M det nye året.
5	2450	Men når { den } _R mannen blir så trygg på familien sin at han tror at han {trenger ikke ikke trenger } _O å vis
6	3393	Men likevel er det vanskelig for meg å {adaptere tilpasse } _W meg { til } _R et fremmed samfunn.
8	4871	Det var en av { de } _R grunnene { til } _M at hun ble mobbet hver eneste dag.
9	6470	Ei bok for barn i småskulen burde ikke {være i første omgang i første omgang være } _O skrevet med { de }
10	9704	Gjennom historien da samfunnreglene { kunne } _M {var være } _F ustabile og uklare { , } _{PUNCM} var familien organisere seg { på } _M i { { en et } _F slags } _R samfunnslivet.
12	9776	I gamle dager var { det } _M de eldste som bestemte alt.
14	11287	Bedriften kan {selfølgelig selvfølgelig } _{ORT} påvirke { i } _R en person som liker å {trakasere trakassere } _{ORT} eller noe liknende.
16	11565	Nå har jeg bare en familie og en kjæreste - fantastisk, forresten - men snart skal jeg ha to familier (eller tre)
18	13970	Bedrifter utnytter netthandelsmetoden { { en et } _F } _R {økonomisk økonomisk } _{ORT} { { viss vis } _{ORT} } _R .
19	14321	Dette er ikke bare { et } _R læreres {probleme problem } _{ORT} , det er { et } _R {samfunns samfunnets } _F {pro
21	14563	Læreren blir trøtt og sint fortere enn { i } _M en klasse med færre elever.
23	15597	Gi {lærere lærerne } _F høyere lønn { , } _{PUNCM} slik at barna {våres våre } _{INFL} er {sikre de sikret } _F til { av
25	16487	Det som kan være negativt {til med } _W å ha et mer åpent forhold mellom {kongefamiliet kongefamilien } _{IN} skulle miste { den } _R betydningen og {rolle rollen } _F i det norske samfunnet.
26	16617	Jeg ser på det norske monarkiet som { på } _R et {gammel gammelt } _F og fredelig {kongeriket kongerike }
28	17115	Jeg vet ikke, fordi det bestemmer { de } _R nordmenn {nordmenn nordmennene } _F selv.

Some user interfaces

ANNIS

learner	von	20	in	Stadt	X	exestierte	Baugenossenschaften
TH1	von	20	in	Stadt	X	existierten	Baugenossenschaften
TH1Diff						CHA	
TH2	von	20	in	Stadt	X	existenten	Baugenossenschaften
TH2Diff						CHA	
EA_category						G_Morphol_Wrong	
EA_category						O_Graph	
EA_category						V_semdenot_word_fs	



Juan Pablo Alperin

@juancommander

Follow



"Standards are like toothbrushes; everyone likes the idea of them, but everyone wants to use their own" #FORCE2017 @Metadata2020