GCND application manual

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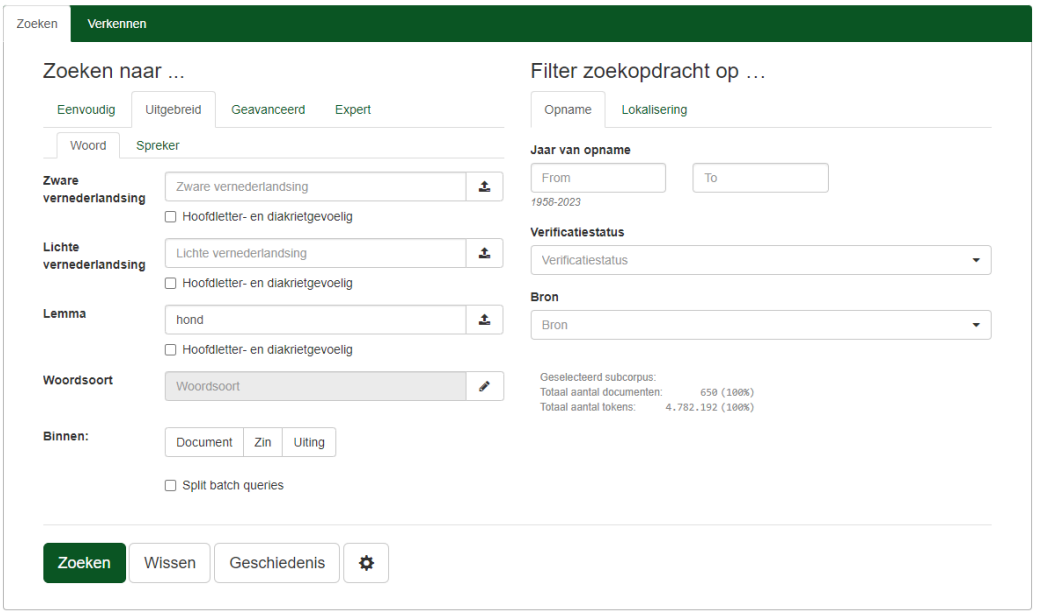
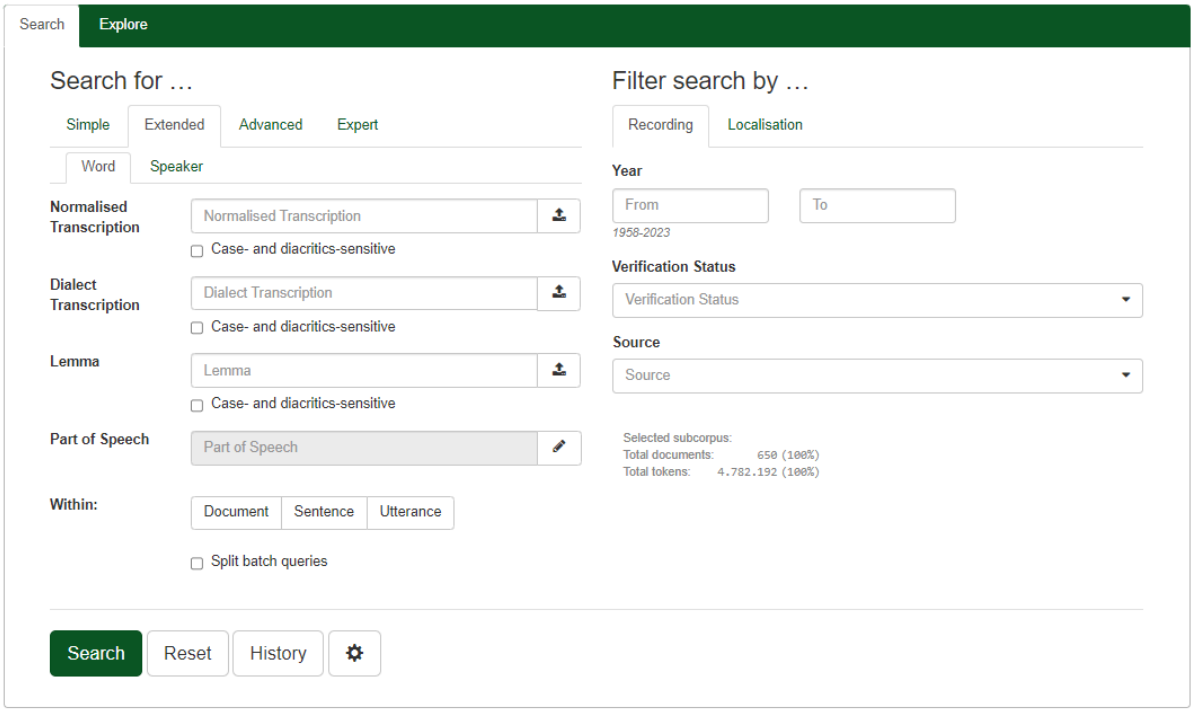
Introduction

The corpus GCND opens in a Dutch version by default.



However, this manual is written in English. Using the globe dropdown menu at the top right, it is possible to translate the Dutch interface into English. The names of search bars, annotations and metadata are then translated into English. The links in the manual will refer to the version you have chosen.



This manual describes the corpus exploitation environment of the Gesproken Corpus van de zuidelijk-Nederlandse Dialecten (GCND). The corpus is a project of Ghent University in collaboration with the Instituut voor de Nederlandse Taal (Dutch Language Institute), the Meertens Instituut (Meertens Institute), the Rijksuniversiteit Groningen (University of Groningen) and Variaties vzw.

The corpus application is developed by the INT. The backend of the application is the BlackLab Lucene based search engine developed for corpora with token-based annotation (http://inl.github.io/BlackLab/). The web-based frontend is a further development of the corpus-frontend application developed by INT (https://github.com/INL/corpus-frontend). Its design is inspired by the first version of the OpenSoNaR user interface by Tilburg and Radboud University (https://github.com/Taalmonsters/WhiteLab2.0).

The application can be found at https://gcnd.ivdnt.org.

Information about the corpus published in the application

The parsed corpus of the Gesproken Corpus van de zuidelijk-Nederlandse Dialecten (GCND) is the first corpus of spoken Dutch dialects. The project aims at making accessible a unique collection of dialect recordings from 768 places in Belgium, the north of France and the south of the Netherlands with speakers that are generally non-mobile, rural, unschooled and born around 1900. All recordings were made by dialectologists from Ghent University and 740 of those recordings were recorded between 1963 and 1976. For the GCND the Ghent collection is being complemented with new

recordings (28 recordings from Brussels, Flemish Brabant and Limburg) and recordings from the Meertens Institute (73 recordings from the south of the Netherlands).

For the GCND, the recordings are transcribed – urgent in times of rapidly progressing dialect loss! – using a newly developed two-tier protocol, and linguistically annotated (i.e. with information on the word class of the individual words ('PoS-tags') and the syntactic functions of word groups and their underlying relationship ('parsing')) using existing software tools.

Linguistic annotation

The transcriptions have been syntactically annotated based on dependency structures according to the Lassy annotation guidelines. For more information on the annotation procedure, see the more extensive project documentation.

Metadata categories

The GCND has been enriched with an elaborate set of metadata categories. These metadata will all be described below. In the corpus application it is possible to limit a search by filtering on metadata categories.

Recording

Year

The year in which a recording was made or the period in which recordings were made.

Verification Status

The verification status indicates how well the text of the recording and any linguistic enrichment has been checked. Four levels are distinguished where the status of transcription is shown on the left and the status of linguistic enrichment is shown on the right:

1. the transcription has been checked, but linguistic enrichment is missing: ✓✗
2. the transcription and linguistic enrichment have both been checked: ✓✓
3. the transcription is checked but linguistic enrichment is not checked: ✓✓
4. the transcription and linguistic enrichment are both not checked: ✓✓

When the transcription and/or linguistic enrichment has not been manually side-checked - that is, if there is a non-bold check mark - the result may not be completely error-free.

Source

The place where the recordings come from, namely Ghent University or the Meertens Institute.

Duration Recording

The duration of the recording (only visible in document view).

Document Length (tokens)

The length of the recording in tokens (only visible in document view).

Localisation

Place

The name of the town or village where the recording was made.

Province

The name of the province where the recording was made (Antwerpen, Be-Limburg, Frans-Vlaanderen, Nl-Limburg, Noord-Brabant, Oost-Vlaanderen, Vlaams-Brabant, Wallonië, West-Vlaanderen, Zeeland).

Country

The name of the country where the recording was made (België, Nederland or Frankrijk).

Dialect Region

A rough classification of eleven dialect areas (major dialect families).

Dialect Subregion

A refined classification of thirty dialect areas (small dialect families). For more information see the project documentation.

Kloekecode

Kloekecodes are unique designations for thousands of places and hamlets in the Netherlands, Flanders, French Flanders and northwestern Germany. The system was designed in the 1920s by the dialectologist G.G. Kloeke and is still being extended. Each Kloekecode consists of an uppercase letter followed by three digits and a lowercase letter, for instance K244p (Antwerp).

SAND place

This button can be used to choose places that are or are not included in the SAND, *Syntactische Atlas van de Nederlandse Dialecten* (Syntactic Atlas of Dutch Dialects).

RND

This button can be used to choose places that are or are not included in the RND, *Reeks Nederlandse Dialectatlassen* (Series of Dutch Dialects Atlases).

Speaker

Gender

The gender of the speaker: male (m, ‘man’) or female (v, ‘vrouw’).

Birth Year

The year of birth of the speaker.

Birthplace

The place of birth of the speaker.

Residential Mobility

The residential mobility indicates whether a speaker has ever moved to another province, within the same province or not at all.

Workplace Mobility

The workplace mobility indicates whether a speaker works in another province, in the same province or does not work at all.

Mother's Origin

The provenance of the speaker's mother, subdivided by same place, same province or other province.

Father's Origin

The provenance of the speaker's father, subdivided by same place, same province or other province.

Partner's Origin

The provenance of the speaker's partner, subdivided by same place, same province or other province.

Speaker ID

The unique number used to identify a speaker.

Application user manual

The spoken dialect words are normalised in two ways. There is a dialect transcription and a normalised transcription of a word. For instance, the dialect word *koeie* has *koeie* as its dialect transcription and *koe* as its normalised transcription. The dialect word *moederken* has as its dialect transcription *moederken* and as its normalised transcription *moeder*. Both versions can be used for searching, grouping and sorting.

Getting started

Here are a few examples of what you can do with the corpus application (the links will take you to the application):

- To search for a heavily normalised word, use Simple Search:
    - Simple Search for Word *moeder*
- To search for different spellings and inflections/conversions of a given lemma, use Lemma in Extended Search:
    - Extended Search for Lemma *vader*
- To search for words or lemmata satisfying a certain pattern, use *wildcards* in Simple Search or Extended Search, or *regular expressions* in Expert Search
    - words starting with *ver* and ending with *len* in Simple Search
    - lemmata starting with *ver* and ending with *len* in Extended Search
    - lemma is *moeder* and is being followed by a form of the verb *zijn* in Advanced Search
    - lemmata starting with *ver* and ending in *eren* with one syllable in between in Expert Search
- To see which unique forms occur as a result of your search, use the Group Results.
    - example Group by Annotation: all words following *lieve*
    - example Group by Annotation: different words preceding the word *huis*
- To explore the distribution of document properties in the corpus, use the Explore feature
    - example: characteristics about the verification status of the documents
    - example: characteristics of the place of the speaker

Searching the corpus

Simple search

Search

The Simple Search allows you to quickly search for a heavily normalised form of a word (e.g. *vriendschap*). It is also possible to enter a phrase: *met de auto* or *ik ben ziek*. To start the search simply press enter or press the Search button.

The search field Normalised Transcription is provided with a list, which contains suggestions for possible search terms in alphabetical order, based on the characters typed in.

Note that in Simple Search the patterns will be matched case-insensitively**:** *jan* will deliver the same results as *Jan*. See the paragraph Group results in Per Hit view to see how it is nevertheless possible to distinguish between uppercase and lowercase letters.

Wildcards

In Simple Search, the use of wildcards can prove good service to search for specific word forms or lemmata. A wildcard is a symbol used to replace or represent one or more characters. The following two wildcards are supported:

* The asterisk matches any character zero or more times. Therefore, searching for *a*n* in Normalised Transcription matches all word forms that start with an *a* and end with a *n*, e.g. *aan, alleen*, *achttien, antwerpen* and so on.

? The question mark matches a single character once. Therefore, searching for *b?n* in Normalised Transcription matches *only* three-letter word forms or lemmata starting with an *b* and ending with a *n*, e.g. *ban*, *ben*, *bin*, *bon*, *bun*.

This wildcard can be used more than once. Thus *d???n* matches *dagen, deden, duren* and *dylan.*

Note that searching with wildcards is limited to Simple Search and Extended Search. [In Advanced Search and Expert Search you can use so-called regular expressions instead of wildcards.]

Reset

You can start a new search by pressing the Reset button. By doing so, both the search query and the hits found will be cleared. Your search history, however, will remain unchanged.

Note that it is also possible to start a new search by entering a new word or phrase in the search field Normalised Transcription.

History

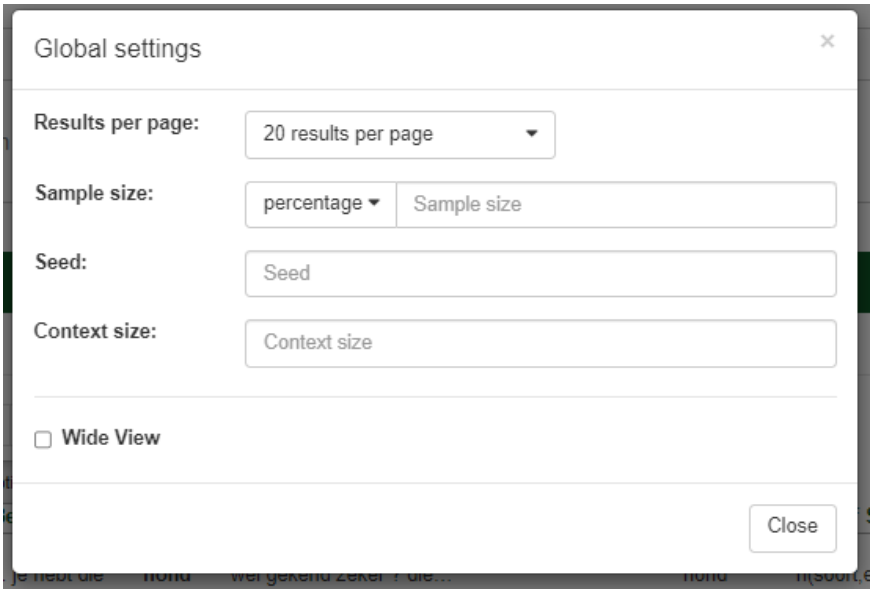
The History button will display your query history. Per search query there are several possibilities (as shown in the screenshot below): you can perform the search query again (Search), you can copy the search query as a link (Copy as link), you can download the search query as a file (Download as file), you can delete a single search query (Delete) or delete all search queries (Delete all).

Every search query has its own url. If you copy this url via History (Copy as link) or directly from the address bar of your browser, you can send it to someone else who can import this link via Import from a link. It offers that person the possibility to run the search on his own computer.

Global settings

The Global settings dialogue, activated by pressing the wheel button, allows you to configure five settings: Results per page, Sample size, Seed, Context size and Wide View.

- *Results per page*: you can choose whether you want 20, 50, 100 or 200 results to be shown;
- *Sample size:* selecting a value here will instruct the search engine to return a random sample drawn from the complete result set. The sample size can be limited by
    - a percentage of the total number of search results (percentage)
    - the number of results displayed (count);
- *Seed:* a 'random seed' is a number used to initialise a so-called pseudo-random number generator. Keeping the same seed will ensure that two samples drawn from the same result set are identical. A new seed will most likely result in a different sample;
- *Context size*: by entering a number you can determine the number of tokens (words or punctuation marks) Before hit and After hit;
- *Wide View:* the default setting is 'small view'; you can change to Wide View by ticking the checkbox.

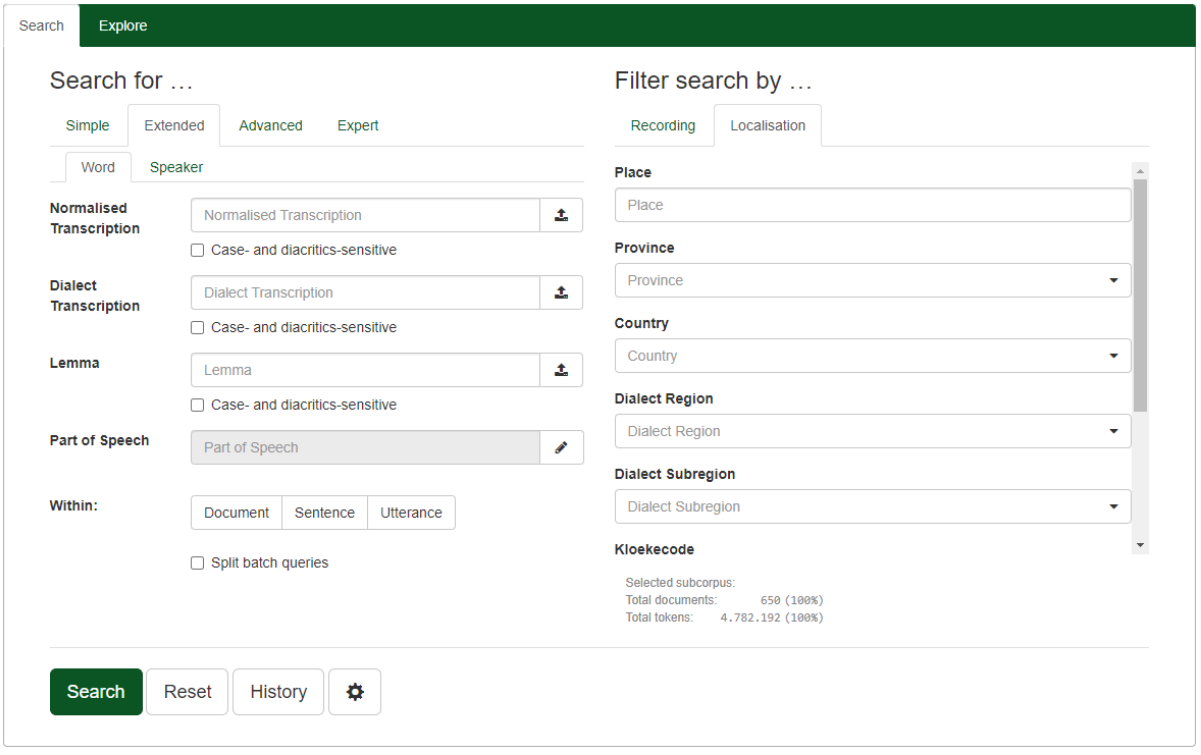


Extended search

In extended search, it is possible to search in two different ways: *Word* and *Speaker*.

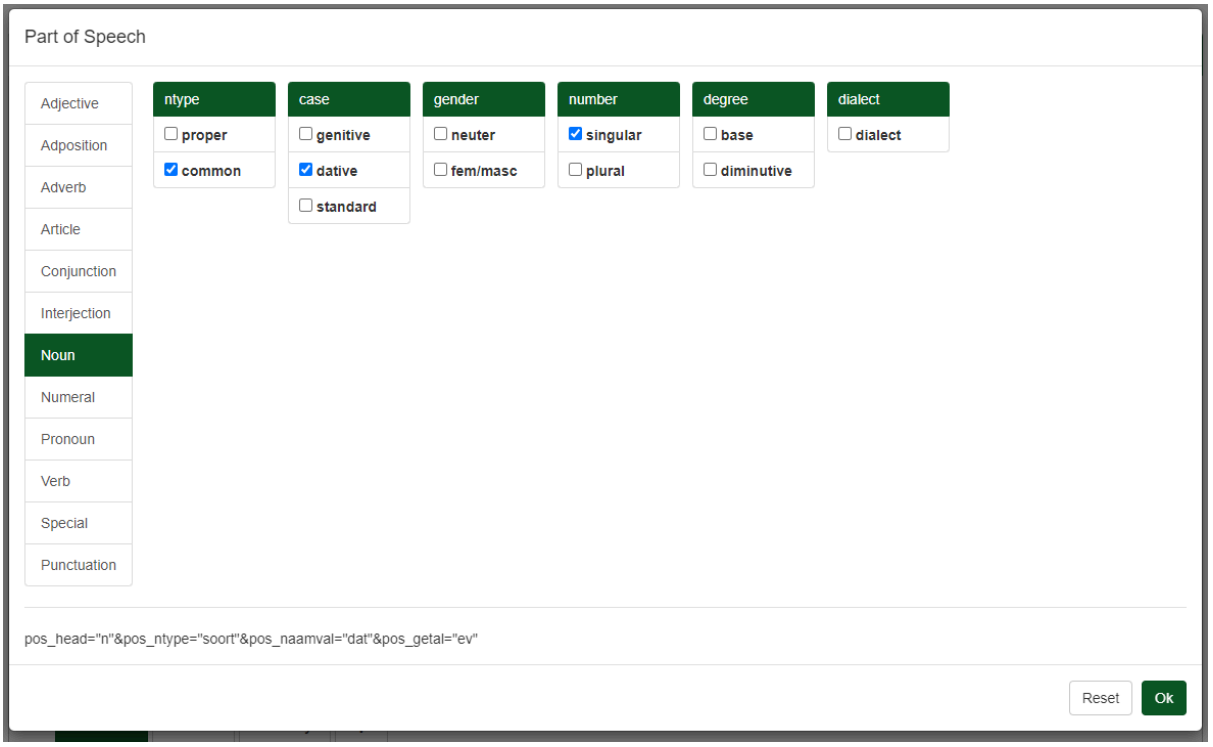
Word

The Extended Search allows you to find all occurrences of a *token* with its specific *attributes*. A *token* - usually just a single word - is the smallest unit within a corpus, whereas *attributes* are the different values that together make up a token. In this corpus the four attributes you can search for are Normalised Transcription (‘a heavily normalised word’), Dialect Transcription (‘a slightly normalised word’), Lemma and Part of Speech.



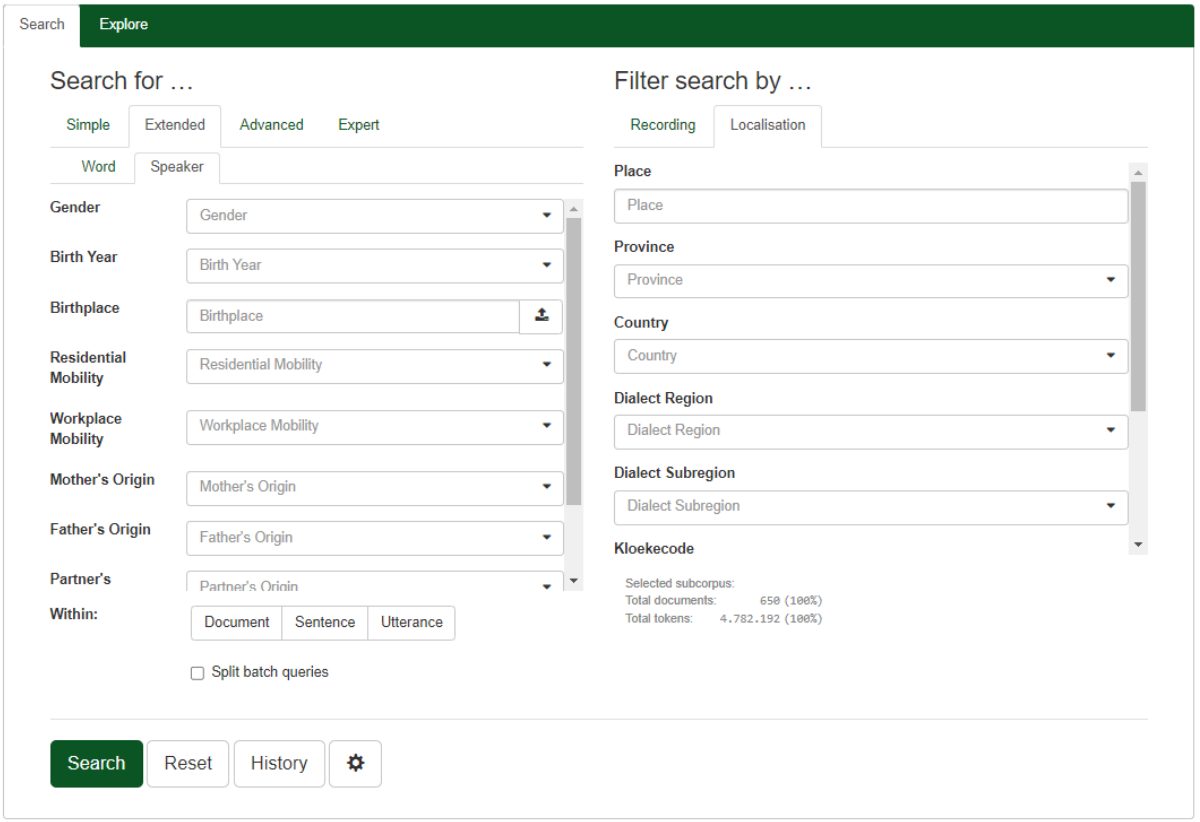
Part of speech dialog box

Clicking on the pencil next to the search field Part of speech provides you with the Part of speech dialog box.



For most of the categories on the left you can tick certain features to further specify your search query. By doing so you can for instance delimit your search, as shown in the above screenshot. The query 'Noun - common - dative - singular' will result in *dage*, *sprake*, *tijde*, *ere* and numerous other hits.

As mentioned above, Word in Extended Search allows you to search for four attributes. You can expand your search options by using the tab Speaker. The following screen will appear:



Speaker

Gender

The gender of the speaker: male (m, ‘man’) or female (v, ‘vrouw’)

Birth Year

The year of birth of the speaker

Birthplace

The place of birth of the speaker

Residential Mobility

The residential mobility indicates whether a speaker has ever moved to another province, within the same province or not at all. There are three options: ja, andere provincie (speaker has also lived in a different place than the specified residence and it was not in the same province); ja, zelfde provincie (speaker has also lived in a different place than the specified residence and it was not in the same province); nee (speaker has always lived in the same place).

Workplace Mobility

The workplace mobility indicates whether a speaker works in another province, in the same province or does not work at all. There are three options: ja, andere provincie (speaker also worked elsewhere than the specified workplace and it was not in the same province); ja, zelfde provincie (speaker also worked elsewhere than the specified workplace, but in the same province); nee (speaker always worked in the same village or town).

Mother's Origin

The provenance of the speaker's mother, subdivided by same place, same province or other province. There are three options: andere provincie (not raised in the same province as the speaker); zelfde plaats (grew up in the same village/same town as the speaker), zelfde provincie (not raised in the same village/city as the speaker, but raised in the same province).

Father's Origin

The provenance of the speaker's father, subdivided by same place, same province or other province. There are three options: andere provincie (not raised in the same province as the speaker); zelfde plaats (grew up in the same village/same town as the speaker), zelfde provincie (not raised in the same village/city as the speaker, but raised in the same province).

Partner's Origin

The provenance of the speaker's partner, subdivided by same place, same province or other province. There are three options: andere provincie (not raised in the same province as the speaker); zelfde plaats (grew up in the same village/same town as the speaker), zelfde provincie (not raised in the same village/city as the speaker, but raised in the same province).

Speaker ID

The speaker ID consists of the document ID (e.g. H009a_1) followed by a sequence number (e.g. _1). Thus, a speaker ID looks like this H009a_1_1. The document ID itself consists of the Kloekecode followed by the recording number. The recording number is the number that indicates how many recordings were made per location. Usually this is 1, but in large cities such as Ghent there are often several recordings made.

Assigning values

Some values of the above attributes can be selected by the use of a drop-down menu, but other attributes provide you the possibility to upload a list of values yourself. The entered values in Word and those in Speaker will be combined in a search query. For instance, searching for the value *lachen* (Word, Normalised Transcription) and the value *1900* (Birth Year) will result in 10 hits from the year 1900.

Upload a list of values

At the right side of the search fields Normalised Transcription, Dialect Transcription, Lemma , Birthplace and Speaker ID there is an option to Upload a list of values; those values must all be separated by a white space. Note that this function only works for *.txt-files. (If you are using a text editor like Word, you have to save your file as a *.txt-file first.)

Every word in the uploaded file will be added to the list of values to search for. To remove the word list simply delete all text in the search field or press the Reset button.

Starting a new search

You can start a new search by pressing the Reset button. By doing so, both the search query and the hits found will disappear. Your search history, however, will remain unchanged.

There are two possibilities to start a search: fill in the desired value and then press enter, or click the Search button. After a change in Part of speech, however, the only way to start a new search, is to click the Search button.

It is possible to apply your search query to all documents of the corpus, which is the default setting. However, it may be desirable to limit a search to a document, a sentence or a utterance. The main reason to do this is to exclude multi-word matches that stretch over a sentence boundary. To do so you can click on these respective buttons.

Batch Splitting

Ticking the option Split batch queries will split a query containing a certain number of attributes, separated by the character | or the boolean operator OR, in a set of smaller queries equal to the number of chosen attributes. Thus every value will be executed as a separate query. The metadata filters filled in by Filter search by (see below) will apply to all subqueries.

After running the query, only the hits for the *last* value will be shown in the results. To obtain the results for the other values you have to go to History, select the value (i.e. pattern) you are looking for and press Search on the right hand side of the history panel.

An example will make this clear. Searching for *boom*|*roos*|*vis*|*vuur* in Lemma will show all hits for *boom*, *roos*, *vis* and *vuur*. When the option Split batch queries is ticked on, the same query will show only hits of *vuur* (being the last value). In History you will therefore find *vuur* on top, followed by the queries *vis*, *roos* and finally *boom*.

Filter search by

At the right side you will find the option to limit your query to a subset of documents with specific metadata values. You can apply different filters for Recording (*Year*, *Verification Status, Source*) and Localisation (*Place, Province, Country*, *Dialect Region*, *Dialect Subregion*, *Kloekecode, SAND Place, RND*). To view the results for all documents, simply leave the attributes in the filtering form empty.

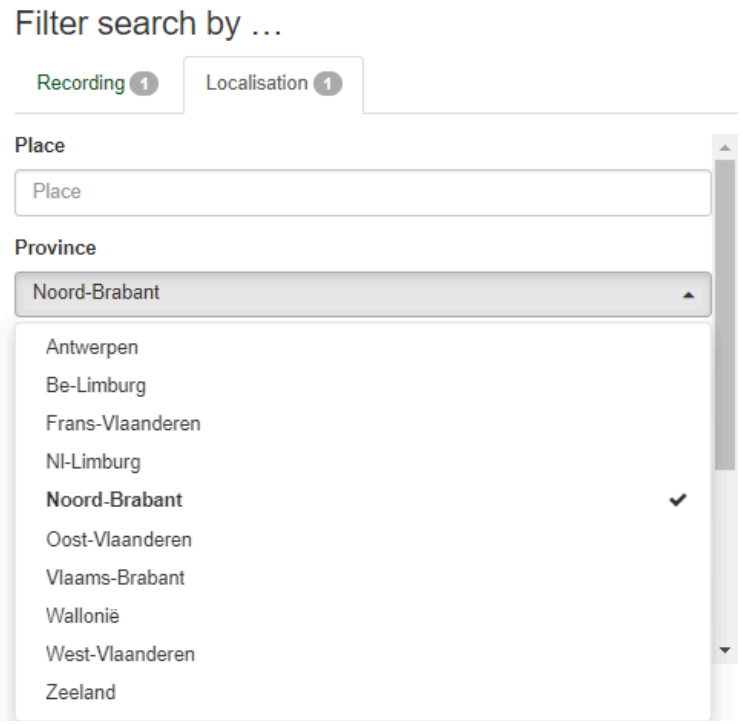
Filter by year

The audio recordings in this corpus were made from 1958 to 2022. You can find a recording from a specific year by entering the same year in the "from" row as in the “to” row (see screenshot below). Recordings from a certain period can be found by entering a start year and an end year. If you do not enter a year, the entire corpus is searched. If you want to filter by another year or another period, please press the Reset button.

Filter by title or article properties

There are two different ways to specify a filter, depending on the field type. You can either fill in a value yourself – for instance Recording: *year*, Localisation: *Place* – or choose one or more values

from a drop-down list – for instance Province. The drop-down list has been applied especially when the number of values to choose from is relatively small. Province for instance has only ten possibilities (Antwerpen, Be-Limburg, Frans-Vlaanderen, Nl-Limburg, Noord-Brabant, Oost-Vlaanderen, Vlaams-Brabant, Wallonië, West-Vlaanderen, Zeeland). You can pick one of these values by clicking on it; your choice will be marked with a tick. It is possible to choose several values. If you want to delete a selection, you can click on the corresponding line again. To close the drop-down list, you can either press the upward pointing arrow in the upper right corner or simply press escape.



When on the other hand the set of possible values is rather large (e.g. Place), you have to type a specific value in the search field. After entering one or more characters, a list of possible values is suggested. Clicking on an auto-completed value will paste that value in the field.

By means of a number at the top of Filter search by, the number of values used to filter on, is displayed as can be seen in the above screenshot.

For a detailed description of the metadata, see the section Metadata categories.

Advanced search

The query builder

The basic building block in the query builder is the *token box* (see below). Each box represents a token – usually just a single word – or a simple repetition of tokens; when multiple tokens are used, they are matched in order from left to right.

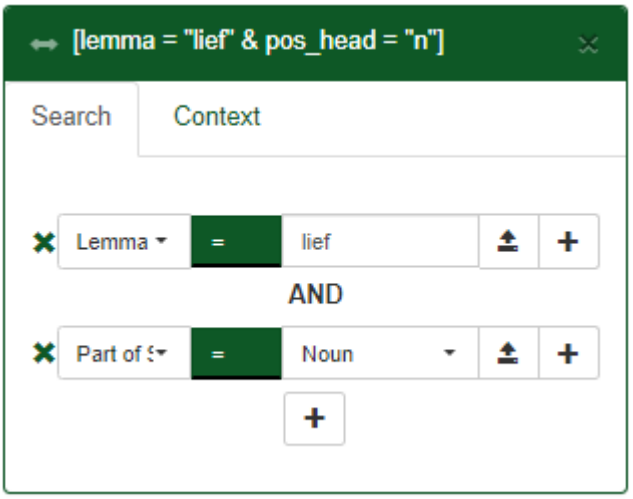
You can use the query builder to create complex queries without writing CQL (here: Corpus Query Language). Therefore, it is easy to use.

A token box in the querybuilder has two tabs: Search and Context.

The tab search

The tab search contains a set of attributes a token in the corpus must have to be matched by the query. By clicking the +-button on the right hand side of this token, you can add new attributes (see below). Then enter a value that the attribute must have for the token to be found. The search command Lemma=*lief* and Part of Speech=*Noun* for example excludes all forms of *lief* as an adjective.

The CQL query generated to match this token (the *token query*) in the corpus is displayed in the top bar of the box, to help you understand what is happening internally. The following applies to our example:



Token attributes

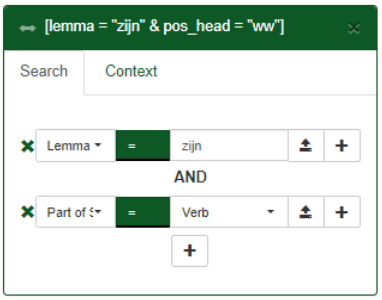
Specifying token attributes is similar to the Extended Search form. Select which attribute a token should have, and enter the value that the attribute must have for the token to be matched. Attributes in the query builder are interpreted as *regular expressions.* Note that this is different from the Extended Search, where token patterns use wildcards.

Going beyond single-attribute token queries, a token box also allows you to combine several attributes and to specify repetition options.

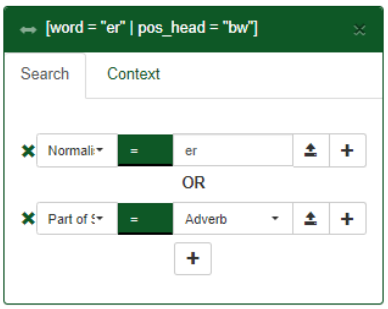
Adding attributes to a token box

Using the +-button, new attributes can be added. Two options exist: *AND* and *OR*.

The *AND* option creates a new attribute restriction that a token must match in addition to the ones which were already there. As an example: suppose we want to match *zijn* (‘to be’) as a verb, not as a pronoun. First, fill in the attribute Lemma with value *zijn*, then click +, choose *AND*, and choose the value Verb for Woordsoort.



Similarly, creating a new attribute using *OR* will create a token query matching tokens that have the original attribute *or* the new attribute. For instance, enter Normalised Transcription=*er* first, add a new attribute with the *OR* option and enter Adverb as Woordsoort to match tokens with part of speech tag Adverb or with word form equal to *er*.

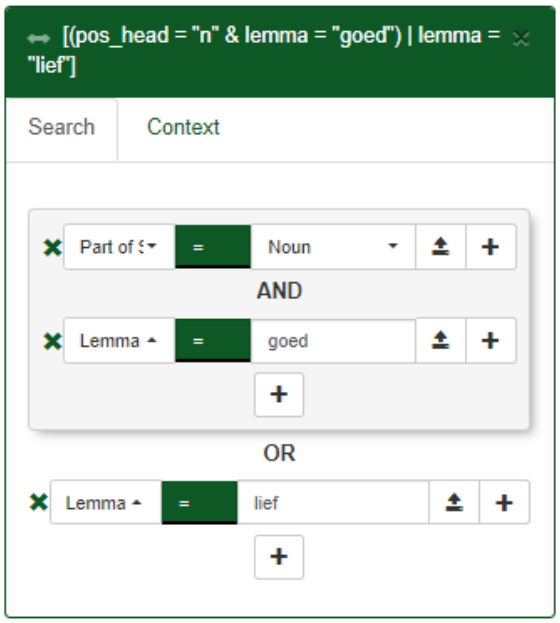


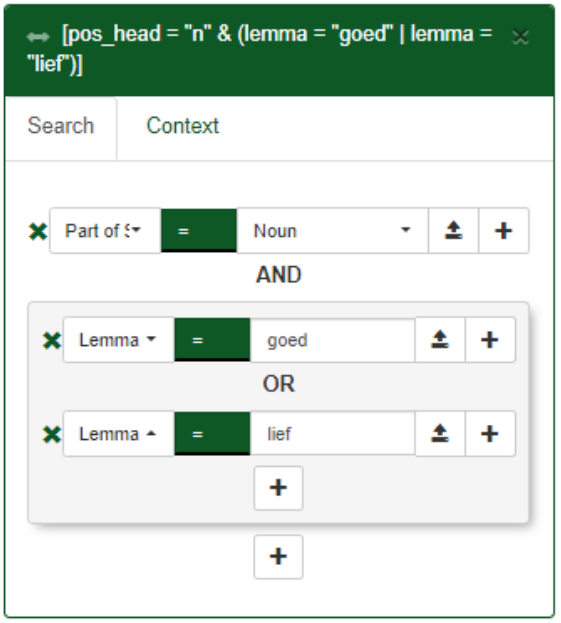
Function of the two +-buttons in a token box

The difference between the +-sign on the right of an attribute and the one below it, is that the +-sign on the right keeps the newly added attribute “within a subclause”. This is most easily explained by means of an example.

Suppose we want to search for either *goed* or *lief*, used as a noun. If we add the attributes in the order Part of Speech=Noun AND Lemma=*goed*, OR Lemma=*lief* using the +-signs **below** the attributes, as in the left screenshot below, we get the token query [(pos_head = "n" & lemma = "goed") | lemma = "lief"]. This will also match adjective forms of *lief*, so this is not what we were after.

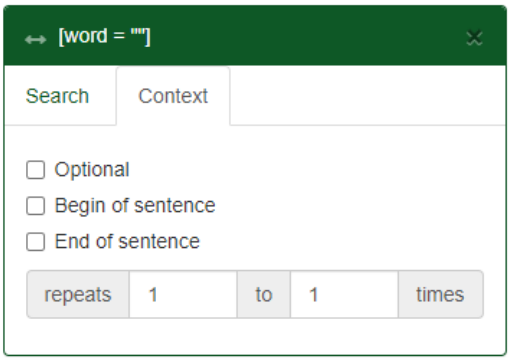
If, on the other hand, we add OR lemma=*lief* with the +-sign to the **right** of the attribute Lemma=*goed*, it will be inserted in a subclause (Lemma=*goed* OR Lemma=*lief*), thus resulting in the correct query [pos_head = "n" & (lemma = "goed" | lemma = "lief")], as shown in the right screenshot below.



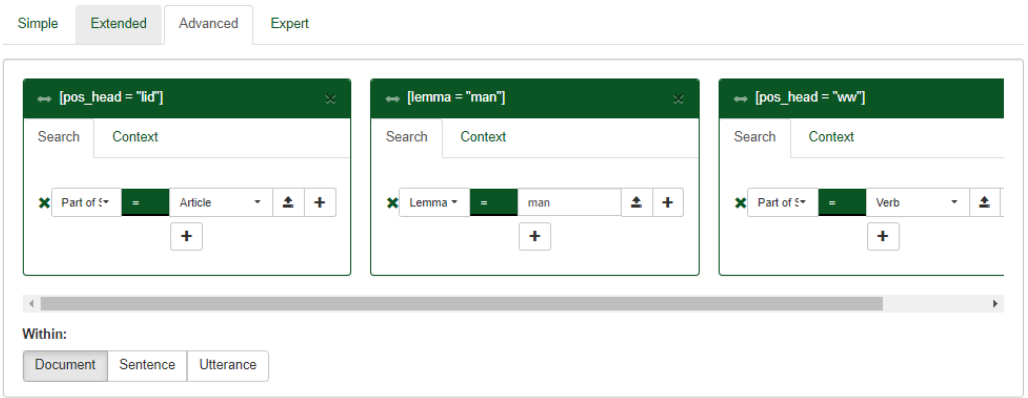


The tab Context

The tab options specifies the contextual properties, such as whether the token occurs at the end of a sentence, and the repetition pattern:



You can use the query builder to create complex queries without writing CQL. Any time a query is created in the querybuilder, it can be copied to the CQL editor, where you can further edit the query by hand.



Managing sequences of token boxes

There are three ways to manage the sequence and the number of token boxes:

- *Rearrange* a token by clicking and dragging the little arrow handle in the top-left corner simultaneously (1).
- *Delete* a token by clicking the x in the top-right corner (2).
- *Create a new token box* by clicking the +-button next to the upper right corner of the utmost right token box (3).

Uploading value lists in the query builder

It is also possible to upload a list of values, separated by a white space. To do so, click the upload button (with the arrow pointing upwards) and select a text file. Tokens will then be matched for any of the values from the file.

Note that this function only works for *.txt-files. If you are using a text editor like Word, you have to save your file as a *.txt file or you can copy and paste the values into a *.txt file first.

After uploading a file, the text can be edited by clicking the yellow marked file name in the text field. Editing the text is temporary and will not modify your original file.

To remove an uploaded file and go back to typing a value, click on the cross (x) next to the yellow text box. Another possibility to clear the uploaded values is by clicking the yellow marked text field and then pressing the Clear button on the bottom left corner of the Edit box. Using the Reset button will start a complete new search.

Copy to CQL editor

It is possible to copy a query – like [pos_head="lid"][lemma="man"][pos_head="ww"] – to the CQL editor using the *Copy to CQL editor* button. This will take you automatically to the Expert Search screen, after which you can start the search or adjust the query if desired.

Expert search

The Corpus Query Language (CQL) editor allows you to type your own CQL query, to import a previously downloaded query and to upload a tab separated list of values to substitute for gap values (see below for further explanation).

CQL queries are expressions built up with the help of a few sequence operators and brackets from basic blocks enclosed by square brackets, in each of which one or more token attributes are specified.

In CQL, spaces only affect a search if they are included in quotes. Whether the search command is [word="schip"] or [word = "schip"] (or just “schip”) does not make any difference to the result. However, there is a difference between the queries [word="schip"] and [word=" schip"]. The first search results in exactly 248 hits, but the second one in zero!

Some examples:

- Simple: `[word="hand"]`, e.g. the attribute word matches the regular expression *hand*; `[word!="hand"]`, e.g. the attribute word does **not** match the regular expression *hand*; `[word=".*man"]` matches all words ending with *man*, including *man* itself. (Note that `[word="*man"]` will not give any results, because in Expert Search an asterisk is not a wildcard but a repetition operator.)
- Combination of attributes (combining operators are &, |, !), e.g. `[word="hoop|geloof|liefde"]` matches either the word *geloof*, the word *hoop* or the word *liefde*.
- The empty `[]` matches any token, e.g. [lemma="man"][]{3}[lemma="god"] matches a sequence of *man* followed by *god* with three arbitrary tokens in between.
- Operators |, & and parentheses () and the repetition operators (+, *, ? and {}) can be used to build complex sequence queries. Example: "laatste" "man" | "eerste" "vrouw", matching any sequence of *laatste man* or *eerste vrouw*.

This short list does not cover all CQL features. For more detailed information on how to write CQL, please consult the short Appendix: Corpus Query Language, which contains further pointers.

Copy to CQL editor

When the query is relatively simple - like [pos_head="adj"][lemma="koe"] - it can also be imported into the querybuilder using the *Copy to query builder* button. This will take you automatically to the Advanced Search screen, after which you can start the search or adjust the query if desired.

A message will be displayed next to the button if the query couldn't be parsed.

Import query

If you have entered a search query, you can find it back by clicking the History button. On the right hand side you can select Download as file in the drop-down menu (default value is Search) and save the file. (For a more elaborate description of the History button see Simple Search.)

Previously saved queries can be used again by uploading them through the Import query button.

Gap filling

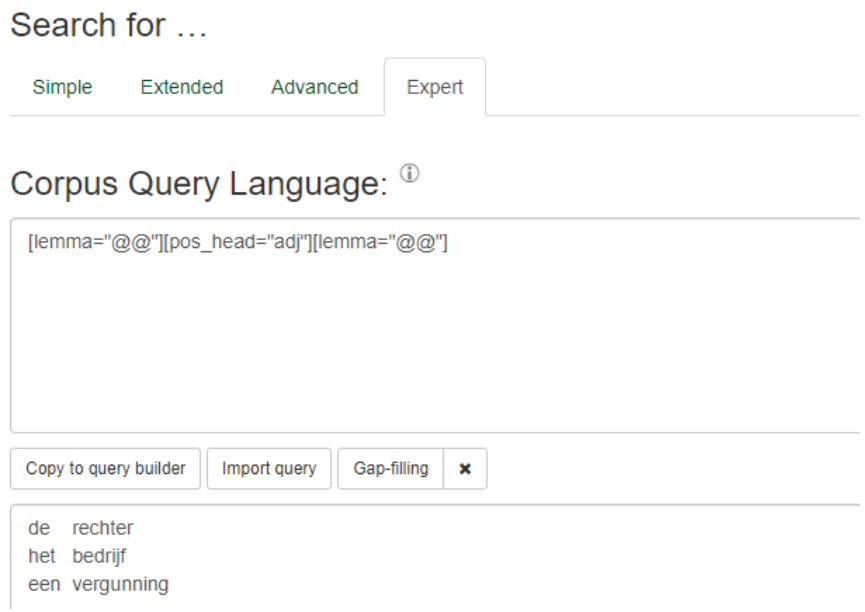
Use this button to upload a Tab Separated Values (TSV) file, which is a simple text format for storing data in a tabular structure. Each record in the table is one line of the text file. Each field value of a record is separated from the next by a tab character. It is also possible to upload a plain text file (.txt) that has the same properties.

A *.tsv file or a comparable *.txt file enables you to complete a query with marked gaps.

If, for instance, you are interested in the distribution of adjectives you can create this query in the Corpus Query Language field:

```
[lemma="@@"][pos_head="adj"][lemma="@@"]
```

By clicking Gap-filling you can upload a file with a tab-separated list of values from your computer to substitute them for the gap values, i.e. the at signs (@@) in your query. After the upload your values will appear in a separate box:



The values in the first column - *de, het, een* - will be entered at the position of the first gap (@@) and the values in the second column - *rechter, bedrijf, vergunning* - at the position of the second gap. With these values, gap-filling yields the following results:

Before Hit	Hit	After Hit	Lemma	Woordsoort (uitgebreid)
I127p_1: Zeeland, Waterlandkerkje				
…wij zitten in … in	**het verschillende bedrijf**	zitten wij . verspreid ….	het verschillend bedrijf	lid(bep,stan,evon) adj(prenom,basis,met-e,stan) n(soort,ev,basis,onz,stan)
I138p_1: Zeeland, Zaamslag				
…Hulst . omdat je daar	**het klein bedrijf**	nog hebt . en die…	het klein bedrijf	lid(bep,stan,evon) adj(prenom,basis,zonder) n(soort,ev,basis,onz,stan)
I209p_1: Oost-Vlaanderen, Sinaai				
…een zoon … is die	**het ouderlijk bedrijf**	kan overnemen dat kan een…	het ouderlijk bedrijf	lid(bep,stan,evon) adj(prenom,basis,zonder) n(soort,ev,basis,onz,stan)
…. maar dat eerste …	**het oudste bedrijf**	… van die twee dus…	het oud bedrijf	lid(bep,stan,evon) adj(prenom,sup,met-e,stan) n(soort,ev,basis,onz,stan)
O150p_1: Oost-Vlaanderen, Denderhoutem				
…de baas . dat is	**het grootste bedrijf**	van heel België . ja…	het groot bedrijf	lid(bep,stan,evon) adj(prenom,sup,met-e,stan) n(soort,ev,basis,onz,stan)

This mimics the functionality to upload a list of values in the Extended Search and Advanced Search interfaces.

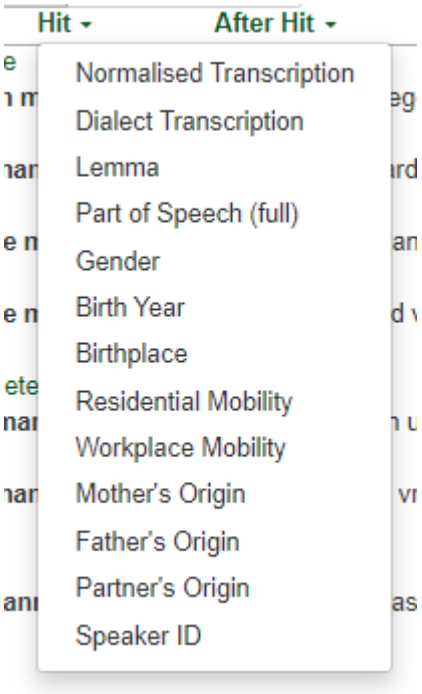
Please note that for this to work, you do need to enter @@ in the field where you want the substitution to take place. An empty field ([]) will match any term.

Viewing results

Results can be viewed in two ways: Per hit (hit is defined as one token or a group of tokens that matched the query), or Per document (each document listed contains at least one hit).

Per Hit view

Click on the dropdown menu next to the bold word Hit to display the properties and values of the hit. Click the hit again to close.



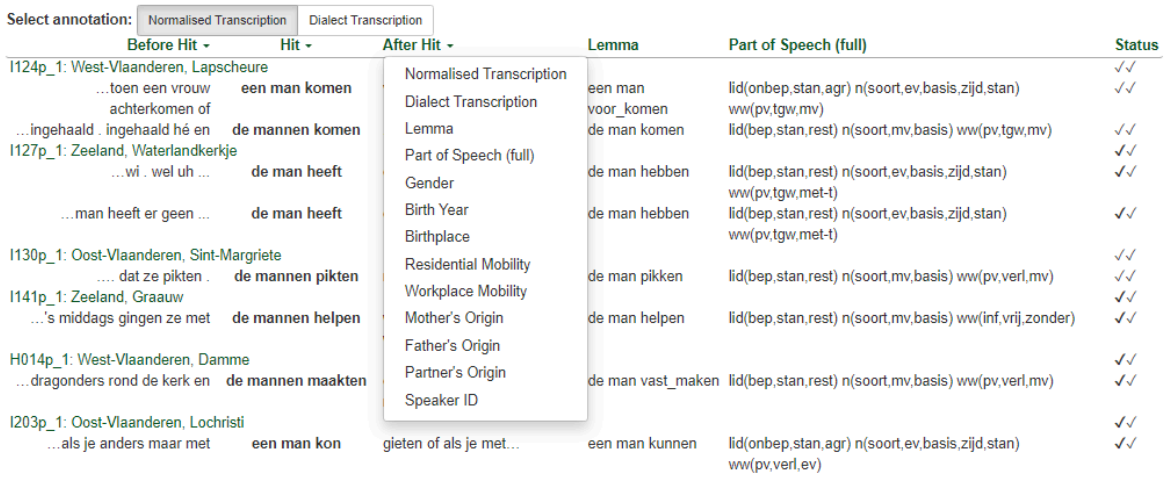
You can sort the results by means of the dropdown menu at the bottom of the page, which offers additional sorting options.

Click a hit to display a part of the document surrounding the hit, with the option to play the audio fragment corresponding to the extended context by clicking the triangle button preceding it. Click the hit again to close.

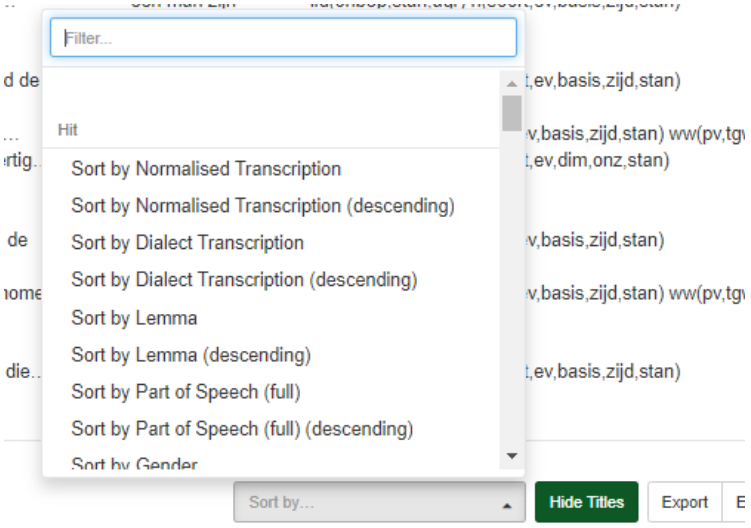
Hit rows are always preceded by a row containing the document title in which those hits occurred, in this case *P041p_1: Vlaams-Brabant, Diest*. The document titles can be toggled on or off by using the Hide Titles (or Show Titles when titles are hidden) button at the bottom of the page. If you hover the mouse over the title, the identification number of the document appears, in this case: Document id: P041p_1.

Sorting results

Click on any of the column headings to sort the hits on values within the column, clicking again inverts the sorting. Extra sorting options are given when clicking on Before hit, Hit and After hit: you can sort by various attributes, as shown below.



You can also sort the results by means of the drop-down menu at the bottom of the page (Sort by…), which offers you the possibility to sort by various attributes, both by Hit, as Before hit, as After hit.



Grouping results

It is possible to group the results by clicking on the button Group Results, after which the following menu appears:

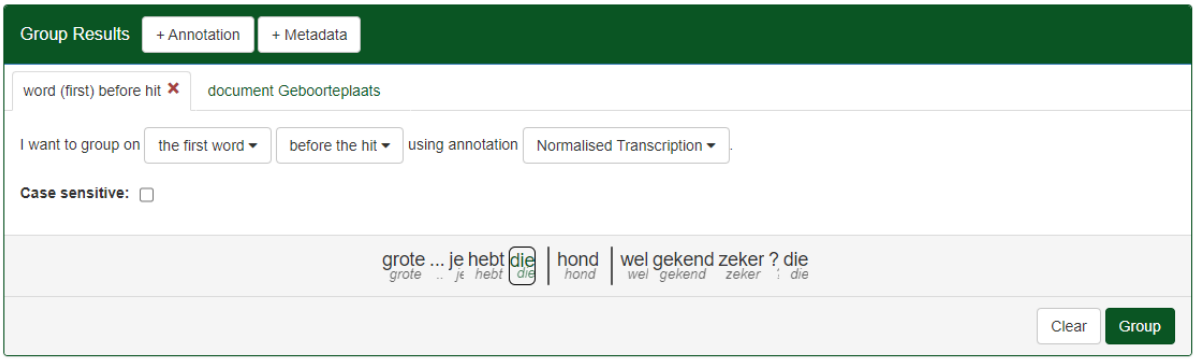
Results can be grouped by Annotation and by Metadata. By clicking +Annotation you can group by the first word, by all words or by specific words, whether within the hit, before the hit or after the hit,

and based on word characteristics (Normalised Transcription, Dialect Transcription, Lemma, Part of Speech).

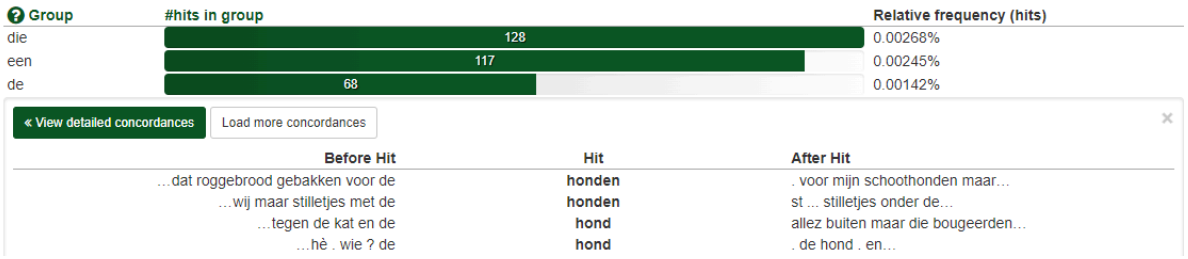
In addition, it is possible to refine the grouping assignment by adding speaker characteristics (Gender, Birth Year, Birthplace, Residential Mobility, Workplace Mobility, Mother's Origin, Father's Origin, Partner's Origin, Speaker ID).

Clicking +metadata allows you to group by metadata assigned to the document (Recording, Localisation, Speaker). By clicking the Case sensitive box it is possible to distinguish between case sensitive and case insensitive.

The example below is grouped by the first word before the hit with normalised transcription and by place of birth of the speaker.



Click a group to show or hide hits within that group, as shown below. Click once more on the group to close it again. If more than twenty hits are found in a document, you can make them appear by clicking on Load more concordances.

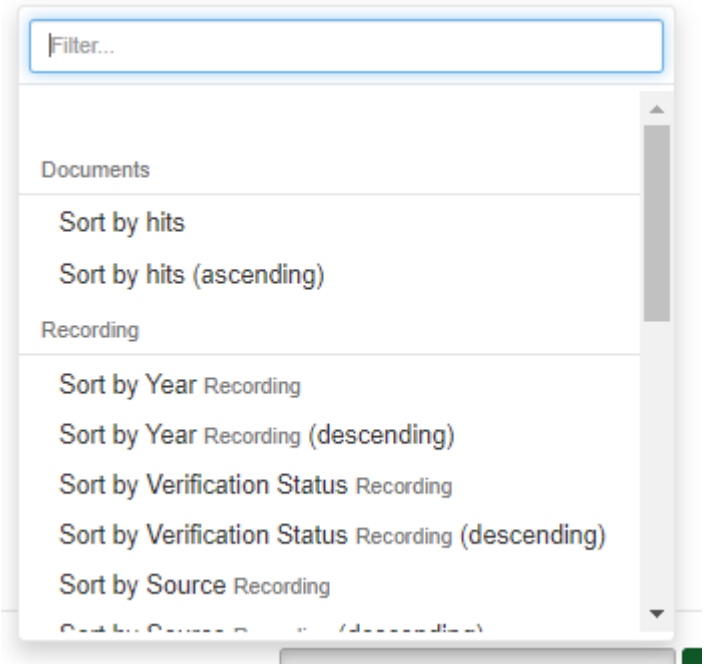


Click on View detailed concordances to go back to the normal hits view to see more detailed information for the hits in this group. The button Back to group overview brings you back to the list of groups.

Per Document view

Sorting results

Results can be sorted by means of the drop-down menu at the bottom of the page, which enables you to sort by Documents (e.g. the number of hits for your search query) and by Recording, Localisation and Speaker.



Click on a Document title to show the Content of the document in a new window. Hits from the current query will be highlighted in bold in the opened document. In the case of several hits the first hit will also appear in shadow. You can go to the next (or previous) hit within the same document by pressing the Hits (and – in the case of many hits – Pages) button.

GrETEL

The sentences where both the transcription and the linguistic enrichment have been checked (both check marks in bold ✓✓) can be further inspected in GrETEL, a treebank application. In the document view, sentences with syntactic parsing are indicated with a light green tree icon in a rectangle on the right. Below the sentence with the hit, the normalised version is presented, preceded by an icon of a tree.

Pressing on that dark green icon will take you the same sentence in GrETEL, where the tree is presented. To close this information, press the tree icon in the rectangle at the end of the sentence.

Grouping results

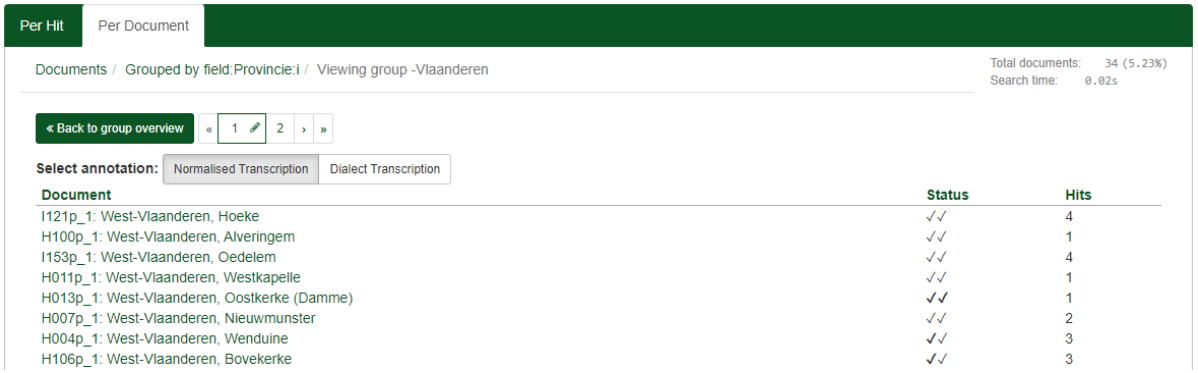
Results Per Document can be grouped by metadata assigned to the document (Recording, Localisation, Speaker). By clicking the Case sensitive box it is possible to distinguish between case-sensitive and case-insensitive.

Exporting results

The search results – both Per Hit as Per Document – can be exported by using the Export or the Export for Excel button at the bottom right of the page. The first button transfers the search results – including all metadata – to a Comma-Separated Values-file. These CSV-files consist only of text data, which makes it easy to implement (read and/or write) them into a spreadsheet or database program.

The second button offers the possibility to export the results – including all metadata – to a CSV-file for use with Excel.

Grouped results can be exported in the same way. However, if you would like to have the metadata with each concordance of a group, you must first click on the green bar of a specific group and then on View detailed concordances (see screenshot below). The results you then see can be exported by the use of the Export buttons. This operation must be carried out for each individual group you wish to export.



Information about a document

Click on a document title to open the document in a new window.

Content

Hits from the current query will be highlighted in the opened document.

Audio fragments

The document view window of corpora with audio fragments also contains play buttons. You can either play the entire sound recording by clicking the play button at the top of the document window, or you can play one utterance by clicking the play button before that utterance.

Metadata

In the metadata tab, all metadata properties of the document are displayed. They provide information about Recording, Localisation and Speaker.

Statistics

The Statistics tab shows several document statistics: the number of Tokens, the number of Types (unique word forms), Parts of Speech (PoS) and Lemmas and also the Type/token ratio. It is possible to print or to download these statistics via the menu symbol right of the title Token/Part of Speech Distribution or via the menu symbol right of the title Vocabulary Growth.

Exploring the corpus

The Explore tab has three subdivisions: Documents, N-grams and Statistics.

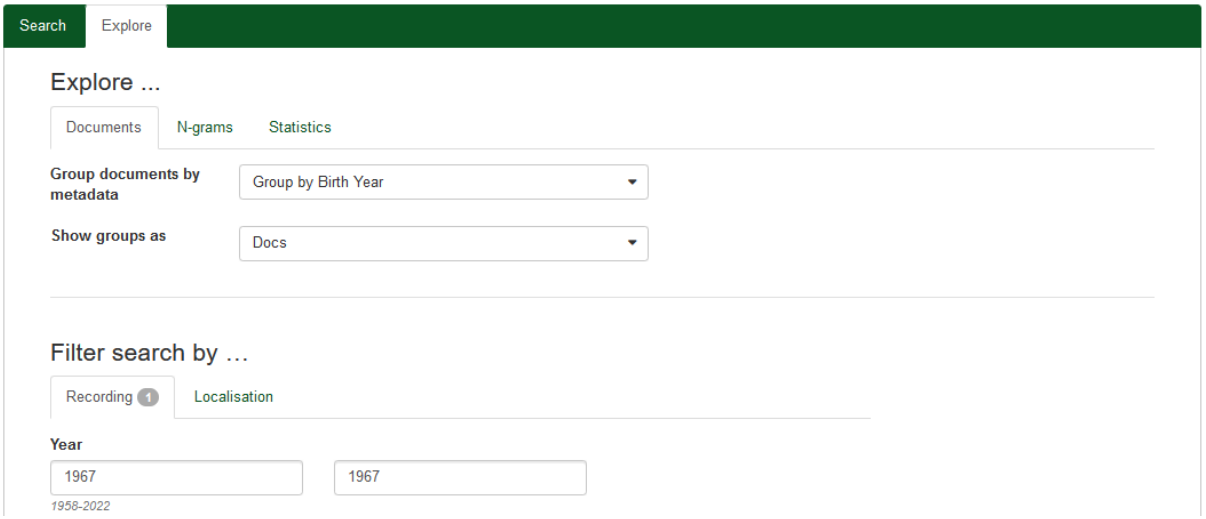
Documents

This subtab allows you to investigate the documents. It consists of two drop-down menus to specify the grouping of the metadata and to specify the way the groups are to be shown.

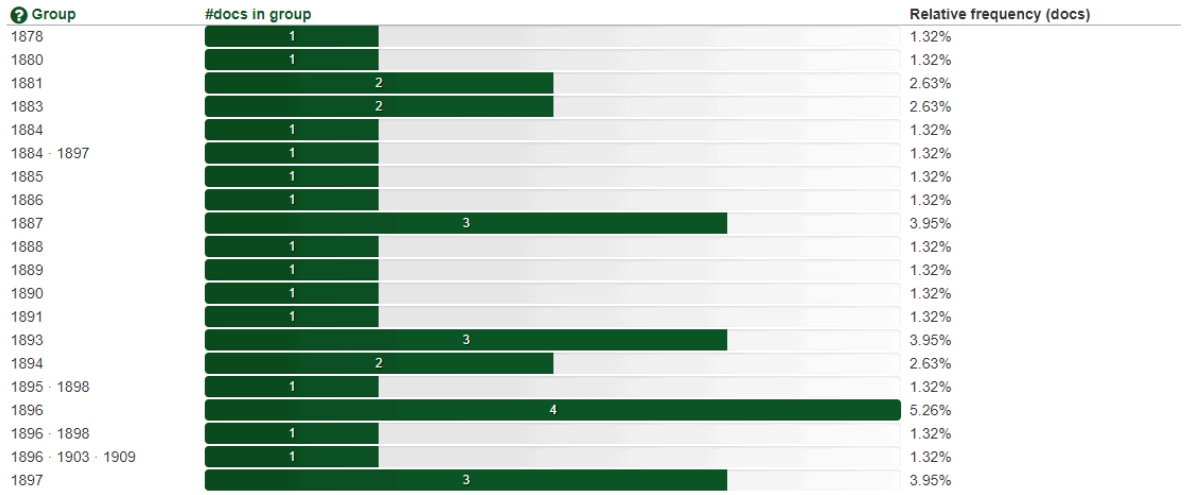
A simple example: suppose we want to obtain information about the number of audio recordings from 1967 grouped by speakers who were born in 1900.

In the Group documents by metadata drop-down menu, choose Group by Birth Year (Speaker)

- In Show groups as, select *docs*
- In the metadata search form (Filter search by), select in Recording, Year: From 1967 to 1967.
- Press Search



After pressing the bar with the number of docs in group, you will - after sorting by group name - this result:



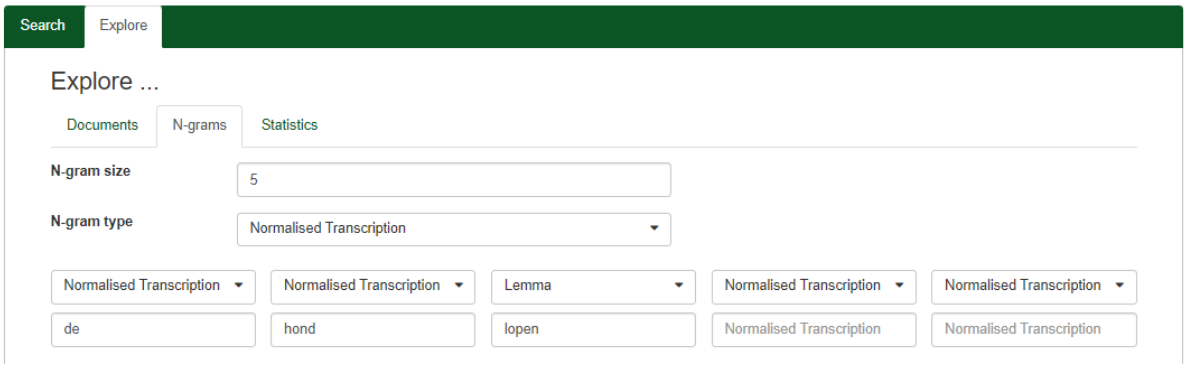
N-grams

An *N-gram* is a sequence of *N* items. This option will list the frequency of different N-grams in a (sub-)corpus.

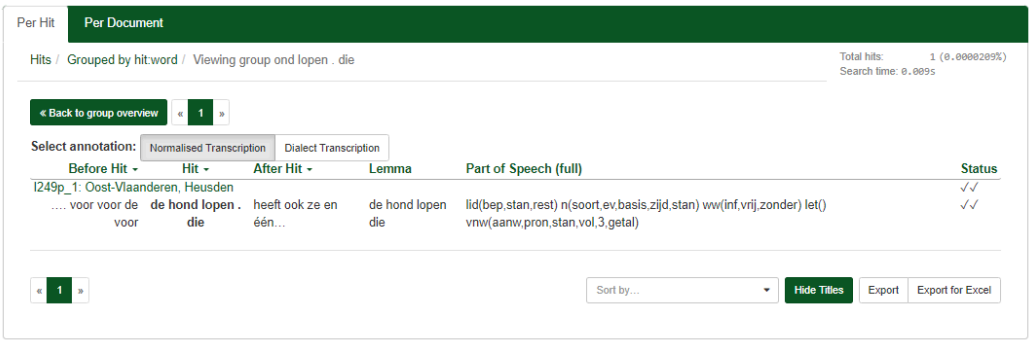
Options

- *N-gram size*: the length of the sequence (a number from 1 to 5; default setting is 5)
- *N-gram-type*: choose for sequences of Word (i.e. Normalised Transcription, Dialect Transcription, Lemma, Part of Speech (full)) or Speaker (Gender, Birth Year, Birthplace, Residential Mobility, Workplace Mobility, Mother's Origin, Father's Origin, Partner's Origin, Speaker ID).
- It is also possible to restrict to, for instance, 5-grams with some slots already specified, as is shown in the following example.
- By using the Filter search by … you can create a subcorpus within the GCND for specific metadata.

Example



Within all the documents of the GCND, you will only find 1 occurrence of this so-called 5-gram, from Heusden (Oost-Vlaanderen):



Statistics (frequency lists)

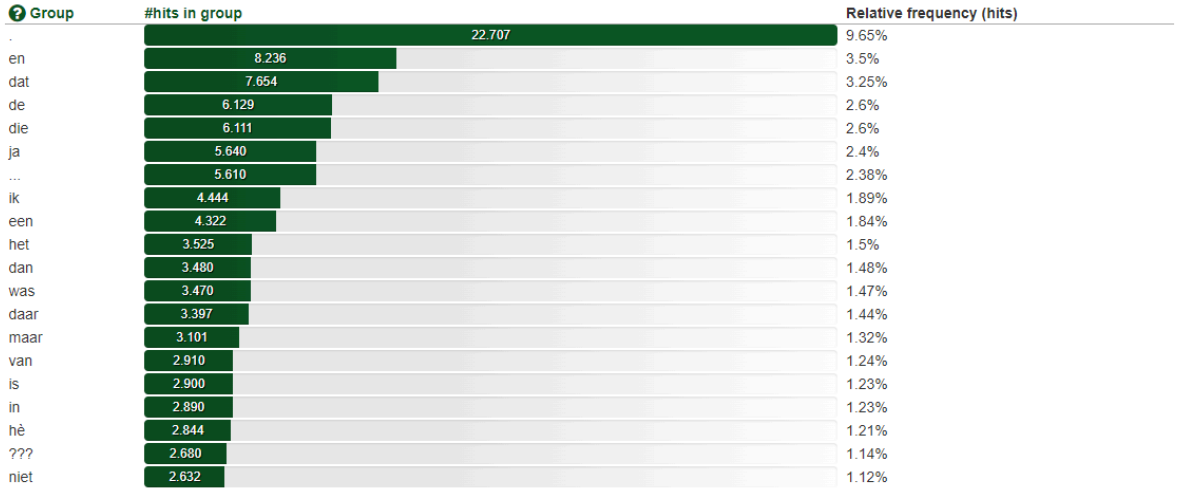
Here, you can produce frequency lists for the corpus. It is rather similar to the previous option, but restricted to 1-grams.

Options

- *Frequency list type:* choose for Word (i.e. Normalised Transcription, Dialect Transcription, Lemma, Part of Speech (full) or Speaker (Gender, Birth Year, Birthplace, Residential Mobility, Workplace Mobility, Mother's Origin, Father's Origin, Partner's Origin, Speaker ID).
- By using the Filter search by... you can create a subcorpus within the GCND for specific metadata.

Example

It is possible to determine the use of the ten most frequently used words in the Province of Belgian Limburg in the GCND by searching for Frequency list type Normalised Transcription and by filtering search by Province. This results in:



Group	#hits in group	Relative frequency (hits)
.	22.707	9.65%
en	8.236	3.5%
dat	7.654	3.25%
de	6.129	2.6%
die	6.111	2.6%
ja	5.640	2.4%
...	5.610	2.38%
ik	4.444	1.89%
een	4.322	1.84%
het	3.525	1.5%
dan	3.480	1.48%
was	3.470	1.47%
daar	3.397	1.44%
maar	3.101	1.32%
van	2.910	1.24%
is	2.900	1.23%
in	2.890	1.23%
hè	2.844	1.21%
???	2.680	1.14%
niet	2.632	1.12%

Appendix: Corpus Query Language

BlackLab supports Corpus Query Language, a full-featured query language introduced by the IMS Corpus WorkBench (CWB) and also supported by the Lexicom Sketch Engine. It is a standard and powerful way of searching corpus.
The basics of Corpus Query Language is the same in all three projects, but there are a few minor differences in some of the more advanced features, as well as some features that are exclusive to some projects. For most queries however, this will not be an issue.
This page will introduce the query language and show all features that BlackLab supports. If you want to learn even more about CQL, see CWB CQP Query Language Tutorial and Sketch Engine Corpus Query Language.

CQL support

For those who already know CQL, here's a quick overview of the extent of BlackLab's support for this query language. If there is a feature we don't support, yet is important to you, please let us know. If it's quick to add, we may be able to help you out.

Supported features

BlackLab currently supports (arguably) most of the important features of Corpus Query Language:

- Matching on token annotations (also called properties or attributes), using regular expressions and =, !=, !. Example: [word="bank"] (or just "bank")
- Case/accent-sensitive matching. Note that, unlike in CWB, case-INsensitive matching is currently the default. To explicitly match case/accent-insensitivity, use "(?i)...". Example: "(?-i)Mr\." "(?-i)Banks"
- Combining criteria using &, | and !. Parentheses can also be used for grouping. Example: [lemma="bank" & pos="V"]
- Match-all pattern [] matches any token. Example: "a" [] "day"
- Regular expression operators +, *, ?, {n}, {n,m} at the token level. Example: [pos="AA"]+
- Sequences of token constraints. Example: [pos="AA"] "cow"
- Operators |, & and parentheses can be used to build complex sequence queries. Example: "happy" "dog" | "sad" cat"
- Querying with tag positions using e.g. <s> (start of sentence), </s> (end of sentence), <s/> (whole sentence) or <s> ... </s> (equivalent to <s/> containing ...). Example: <s> "The" . XML attribute values may be used as well, e.g. <ne type="PERS"/> ("named entities that are persons").
- Using within and containing operators to find hits inside another set of hits. Example: "you" "are" within <s/>
- Using an anchor to capture a token position. Example: "big" A:[]. Captured matches can be used in global constraints (see next item) or processed separately later (using the Java interface; capture information is not yet returned by BlackLab Server). Note that BlackLab can actually capture entire groups of tokens as well, similarly to regular expression engines.
- Global constraints on captured tokens, such as requiring them to contain the same word. Example: "big" A:[] "or" "small" B:[] :: A.word = B.word

See below for features not in this list that may be added soon, and let us know if you want a particular

feature to be added.

Differences from CWB

BlackLab's CQL syntax and behaviour differs in a few small ways from CWBs. In future, we'll aim towards greater compliance with CWB's de-facto standard (with some extra features and conveniences).
For now, here's what you should know:

- Case-insensitive search is currently the default in BlackLab, although you can change this if you wish. CWB and Sketch Engine use case-sensitive search as the default. We may change our default in a future major version.
  If you want to switch case-/diacritics-sensitivity, use "(?-i).." (case-sensitive) or "(?i).." (case-insensitive, usually the default). CWBs %cd flags for setting case/diacritics-sensitivity are not (yet) supported, but will be added.
- If you want to match a string literally, not as a regular expression, use backslash escaping: "e\.g\.". %l for literal matching is not yet supported, but will be added.
- BlackLab supports result set manipulation such as: sorting (including on specific context words), grouping/frequency distribution, subsets, sampling, setting context size, etc. However, these are supported through the REST and Java APIs, not through a command interface like in CWB. See BlackLab Server overview).
- Querying XML elements and attributes looks natural in BlackLab: <s/> means "sentences", <s> means "starts of sentences", <s type='A'> means "sentence tags with a type attribute with value A". This natural syntax differs from CWBs in some places, however, particularly when matching XML attributes. While we believe our syntax is the superior one, we may add support for the CWB syntax as an alternative.
  We only support literal matching of XML attributes at the moment, but this will be expanded to full regex matching.
- In global constraints (expressions occurring after ::), only literal matching (no regex matching) is currently supported. Regex matching will be added soon. For now, instead of A:[] "dog" :: A.word = "happy|sad", use "happy|sad" "dog".
- To expand your query to return whole sentences, use <s/> containing (...). We don't yet support CWBs expand to, expand left to, etc., but may add this in the future.
- The implication operator -> is currently only supported in global constraints (expressions after the :: operator), not in regular token constraints. We may add this if there's demand for it.
- We don't support the @ anchor and corresponding target label; use a named anchor instead. If someone makes a good case for it, we will consider adding this feature.
- backreferences to anchors only work in global constraints, so this doesn't work: A:[] [] [word = A.word]. Instead, use something like: A:[] [] B:[] :: A.word = B.word. We hope to add support for these in the near future, but our matching approach may not allow full support for this in all cases.

(Currently) unsupported features

The following features are not (yet) supported:

- intersection, union and difference operators. These three operators will be added in the future. For now, the first two can be achieved using & and | at the sequence level, e.g. "double" [] & []

"trouble" to match the intersection of these queries, i.e. "double trouble" and "happy" "dog" | "sad "cat" to match the union of "happy dog" and "sad cat".

- _ meaning "the current token" in token constraints. We will add this soon.
- lbound, rbound functions to get the edge of a region. We will probably add these.
- distance, distabs functions and match, matchend anchor points (sometimes used in global constraints). We will see about adding these.
- using an XML element name to mean 'token is contained within', like [(pos = "N") & !np] meaning "noun NOT inside in an tag". We will see about adding these.
- a number of less well-known features. If people ask, we will consider adding them.

Using Corpus Query Language

Matching tokens

Corpus Query Language is a way to specify a "pattern" of tokens (i.e. words) you're looking for. A simple pattern is this one:

```
[word="man"]
```

This simply searches for all occurrences of the word "man". If your corpus includes the per-word properties lemma (i.e. headword) and pos (part-of-speech, i.e. noun, verb, etc.), you can query those as well. For example, to find a form of word "search" used as a noun, use this query:

```
[lemma="search" & pos="NOU-C"]
```

This query would match "search" and "searches" where used as a noun. (Of course, your data may contain slightly different part-of-speech tags.)
The first query could be written even simpler without brackets, because "word" is the default property:

```
"man"
```

You can use the "does not equal" operator (!=) to search for all words except nouns:

```
[pos != "NOU-C"]
```

The strings between quotes can also contain wildcards, of sorts. To be precise, they are regular expressions, which provide a flexible way of matching strings of text. For example, to find "man" or "woman", use:

```
"(wo)?man"
```

And to find lemmata starting with "under", use:

```
[lemma="under.\*"]
```

Explaining regular expression syntax is beyond the scope of this document, but for a complete overview, see here.

Sequences

Corpus Query Language allows you to search for sequences of words as well (i.e. phrase searches, but with many more possibilities). To search for the phrase "the tall man", use this query:

```
"the" "tall" "man"
```

It might seem a bit clunky to separately quote each word, but this allow us the flexibility to specify exactly what kinds of words we're looking for. For example, if you want to know all single adjectives used with man (not just "tall"), use this:

```
"an?|the" [pos="AA"] "man"
```

This would also match "a wise man", "an important man", "the foolish man", etc.

Regular expression operators on tokens

Corpus Query Language really starts to shine when you use the regular expression operators on whole tokens as well. If we want to see not just single adjectives applied to "man", but multiple as well:

```
"an?|the" [pos="AA"]+ "man"
```

This query matches "a little green man", for example. The plus sign after [pos="AA"] says that the preceding part should occur one or more times (similarly, * means "zero or more times", and ? means "zero or one time").
If you only want matches with two or three adjectives, you can specify that too:

```
"an?|the" [pos="AA"]{2,3} "man"
```

Or, for two or more adjectives:

```
"an?|the" [pos="AA"]{2,} "man"
```

You can group sequences of tokens with parentheses and apply operators to the whole group as well. To search for a sequence of nouns, each optionally preceded by an article:

```
("an?|the"? [pos="NOU-C"])+
```

This would, for example, match the well-known palindrome "a man, a plan, a canal: Panama!" (A note about punctuation: in BlackLab, punctuation tends to not be indexed as a separate token, but as a property of a word token - CWB and Sketch Engine on the other hand tend to index punctuation as a separate token instead. You certainly could choose to index punctuation as a separate token in BlackLab, by the way -- it's just not commonly done. Both approaches have their advantages and disadvantages, and of course the choice affects how you write your queries.)

Case- and diacritics-sensitivity

CWB and Sketch Engine both default to (case- and diacritics-)sensitive search. That is, they exactly match upper- and lowercase letters in your query, plus any accented letters in the query as well. BlackLab, on the contrary, defaults to *IN*sensitive search (although this default can be changed if you like). To match a pattern sensitively, prefix it with "(?-i)":

```
"(?-i)Panama"
```

If you've changed the default search to sensitive, but you wish to match a pattern in your query insensitively, prefix it with "(?i)":

```
[pos="(?i)NOU-C"]
```

Although BlackLab is capable of setting case- and diacritics-sensitivity separately, it is not yet possible from Corpus Query Language. We may add this capability if requested.

Matching XML elements

Corpus Query Language allows you to find text in relation to XML elements that occur in it. For example, if your data contains sentence tags, you could look for sentences starting with "the":

```
<s>"the"
```

Similarly, to find sentences ending in "that", you would use:

```
"that"</s>
```

You can also search for words occurring inside a specific element. Say you've run named entity recognition on your data and all person names are surrounded with <person>...</person> tags. To find the word "baker" as part of a person's name, use:

```
"baker" within <person/>
```

Note the forward slash at the end of the tag. This way of referring to the element means "the whole element". Compare this to <person>, which means "the element's open tag", and </person>, which means "the element's close tag".
The above query will just match the word "baker" as part of a person's name. But you're likely more interested in the entire name that contains the word "baker". So, to find those full names, use:

```
<person/> containing "baker"
```

Or, if you simply want to find all persons, use:

```
<person/>
```

As you can see, the XML element reference is just another query that yields a number of matches. So as you might have guessed, you can use "within" and "containing" with any other query as well. For example:

```
([pos="AA"]+ containing "tall") "man"
```

will find adjectives applied to man, where one of those adjectives is "tall".

Labeling tokens, capturing groups

Just like in regular expressions, it is possible to "capture" part of the match for your query in a "group".
CWB and Sketch Engine offer similar functionality, but instead of capturing part of the query, they label a single token. BlackLab's functionality is very similar but can capture a number of tokens as well. For example:

```
"an?|the" Adjectives:[pos="AA"]+ "man"
```

This will capture the adjectives found for each match in a captured group named "Adjectives".

BlackLab also supports numbered groups:

```
"an?|the" 1:[pos="AA"]+ "man"
```

Global constraints

If you tag certain tokens with labels, you can also apply "global constraints" on these tokens. This is a way of relating different tokens to one another, for example requiring that they correspond to the same word:

```
A:[] "by" B:[] :: A.word = B.word
```

This would match "day by day", "step by step", etc.