The Danish Sign Language Dictionary

Jette H. Kristoffersen and Thomas Troelsgård
University College Capital, Copenhagen, Denmark

The entries of the The Danish Sign Language Dictionary *have four sections:*

- *Entry header: In this section the sign headword is shown as a photo and a gloss. The first occurring location and handshape of the sign are shown as icons.*
- *Video window: By default the base form of the sign headword is shown. Other types of videos are rendered in this window, but activated by clicking play buttons in different sections of the entry.*
- *Meanings window: In this section the meanings of the sign are shown. The meaning description includes: Danish equivalents, a description of the sign's usage (for function signs) and mouth movement, cross-references to synonyms etc., information about restricted use, and example sentences. Semantically opaque compounds with the sign are shown below the regular meanings.*
- *Additional information: This section holds cross-references to homonyms and to common frozen forms of the sign (only for classifier entries). In addition to this, frequent co-occurrences with the sign are shown in this section.*

The signs in the The Danish Sign Language Dictionary *can be looked up through:*

- *Handshape: Particular handshapes for the active and the passive hand can be specified. There are 65 searchable handshapes.*
- *Location: Location is chosen from a page with 15 location icons, representing locations on or near the body.*
- *Text: Text searches are performed both on Danish equivalents, sign glosses and example sentences (both transcriptions and translations). This enables users to find signs that are not themselves lemmas in the dictionary, but appear in example sentences.*
- *Topic: Topics can be chosen as search criteria from a list of 70 topics.*

1. Introduction

Until recent times most sign language dictionaries were mere wordlists, with words from a spoken language, each accompanied by a picture or a verbal description of a sign.

In the late 20th century the scientific exploration of sign language developed rapidly, and a series of new scientifically based sign language dictionaries emerged, the first being *A Dictionary of American Sign Language on Linguistic Principles*, Stokoe et. al. (1965). These dictionaries typically have sign language as the source language.

Over the last decades, sign language lexicography has also benefited tremendously from technological advances. Thus, the decision of how to represent signs in a dictionary used to be a major problem, but now digital video recordings of signs can easily be integrated into electronic dictionaries.

Still, certain obstacles remain for the sign language lexicographer. For example, some form of formal notation of the signs is needed in order to refer uniquely to the signs, to perform sign searches and to order the signs in search results etc. Also, a sign language dictionary with sign language as the source language requires more advanced search functionalities compared to a dictionary of a written language, for example in order to enable searches on manual features.

The *Danish Sign Language Dictionary* is practically a bidirectional bilingual Danish Sign Language (DTS) - Danish dictionary, but its structure places it somewhere between bilingual and monolingual. There is only one set of entries, with DTS signs as headwords. The entries are structured according to the semantics of the signs, and almost all information, including usage examples, concerns DTS, except for disambiguating explanations of homographic or strongly polysemous Danish equivalents. This approach was chosen in order to keep focus on

DTS, as the need for information about Danish words can easily be met by existing Danish all-round monolingual dictionaries like *Nudansk Ordbog*, e.g. *Politikens Nudansk Ordbog med etymologi* (2001), which is present in almost any Danish home and classroom. As a result of this decision, the *Danish Sign Language Dictionary* could be described as monolingual dictionary, which instead of definitions has (searchable) equivalents in another language, Danish, which is also the general metalanguage of the dictionary.

2. Entry layout in the *Danish Sign Language Dictionary*

The entries of the *Danish Sign Language Dictionary* have four sections (cf. figure 1):

2.1. Entry header
In this section the sign headword is shown as a photo and a gloss. The first occurring location and handshape of the sign are shown as icons. Lastly, there are buttons for opening separate windows with a printable sign overview and with a concordance view of all usage examples including the sign.

2.2. Video window
By default the base form of the sign headword is shown. If the sign varies in form, play buttons activating videos of the variants are shown in top of the video window. There are also control buttons for slow-motion and enlarged view. Other videos, e.g. of usage examples, are activated by clicking play buttons in different sections of the entry.

Figure 1. The four sections of an entry in the Danish Sign Language Dictionary.

2.3. Meanings window
In this section the meanings of the sign are described. The meaning description includes: Danish equivalents, a description of the sign's usage (for function signs), information about

possible mouth movements, cross-references to synonyms etc., information about restricted use, and example sentences. Semantically opaque compounds with the sign are shown below the regular meanings.

2.4. Additional information
This section holds cross-references to homonyms and to common frozen forms of the sign (only for classifier entries). In addition to this, frequent co-occurrences with the sign are shown in this section.

3. Looking up signs in the *Danish Sign Language Dictionary*

3.1. Choosing search criteria
The signs in the *Danish Sign Language Dictionary* can be looked up through search criteria from different categories: handshape, location, text and topic, and through combinations of these.

Particular handshapes for the active and the passive hand can be specified. There are 65 searchable handshapes. The handshapes to be used in the search criteria are selected in groups of related handshapes, but unwanted handshapes can be deselected individually. This enables the user to select single handshapes or custom groups of handshapes, independently of the default handshape grouping. Figure 2 shows a part of the handshape selection window, with the extended index finger group currently activated.
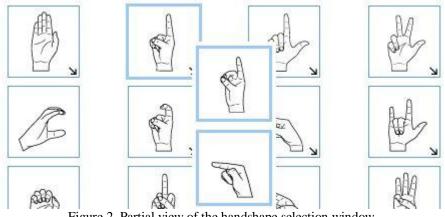

Figure 2. Partial view of the handshape selection window.

Location is chosen from a page with 15 location icons, representing locations on or near the body. In addition to these it is possible to choose location through four "group headers". If a group header is chosen, all locations in the group are included in the search criteria. Additionally two options are available for choosing locations in the space in front of the body: one for the neutral space in general, and one for locations in front of the face. A section of the location selection window is shown in figure 3.

Text searches are performed both on Danish equivalents, sign glosses and example sentences (both transcriptions and translations). This enables users to find signs that are not themselves lemmas in the dictionary, but appear in example sentences. Phrase searches and wildcard searches are possible.
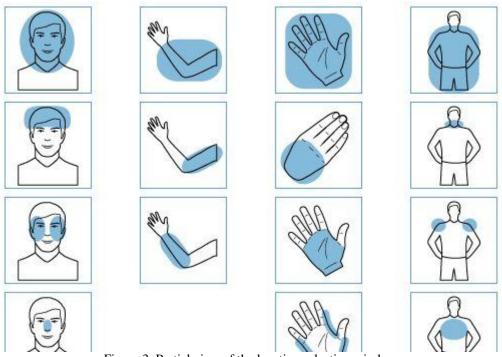
Figure 3. Partial view of the location selection window.

Topics can be chosen as search criteria from a list of 70 topics. The topics are ordered into nine groups, with subgroups in two levels. Topics which are group headers automatically include all subordinate topics in the search criteria.

Several criteria categories can be combined. Inside each category an "or" condition is used, while "and" conditions are used for category combinations.

Figure 4. Criteria list (and part of the result list) for a combined search on handshape and topic.

The currently chosen criteria are shown in the left side of the screen. Figure 4 shows the criteria list for a search for signs that are produced with the handshape *extended index finger* and concern the topic *religion*.

3.2. Adjusting the search

The search criteria and the result list are shown side by side in order to facilitate adjustments of the search (cf. figure 4, where the result list can be seen to the right). For the same purpose the search criteria can be deselected individually, by clicking them, or cleared altogether, by clicking a reset button.

In order to secure that all possibly relevant matches are included in a search result, the search function in the Danish Sign Language Dictionary is quite broad. For manual features, that means that all occurring locations and handshapes in a sign, both prominent and non-prominent, are taken into account by the search function. Similarly, all text string matches, both among glosses, equivalents, and translations of usage examples are included in the search result. The matches of a search are ordered by relevance. For handshape and location matches this means that they are weighted according to their appearance in the sign, so that the first occurring handshape or location scores higher than the following. Text search matches are weighted in the following order: glosses, Danish equivalents, glosses in usage examples, words in the translations of usage examples. Thus, a matching gloss or equivalent scores higher, than a match in a usage example. Based on the calculated relevance scores each match receives from none to three "relevance stars", and the matches are ordered accordingly (see the result list shown to the right in figure 4). Matches with equal relevance score are ordered firstly by location, secondly by handshape. In addition to this, the user can choose between two sort orders: firstly by location, secondly by handshape, with no regard to the relevance score. These alternative sort orders are activated by clicking their according tabs in top of the result list. A third tab re-establishes the default, relevance-based sort order.

References

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