



XVII EURALEX

International Congress

6-10 September, 2016

Tbilisi

Proceedings of the XVII EURALEX International congress

Lexicography and Linguistic Diversity

Edited by TinatinMargalitadze, George Meladze



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The digital copy of the Proceedings of the XVII EURALEX International Congress
can be downloaded at the following URL

<http://euralex2016.tsu.ge/publication.html>

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ISBN: 978-9941-13-542-2

The Division into Parts of Speech in the *Corpus-based Dictionary of Polish Sign Language*

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Abstract

Recent decades have seen a spectacular development in sign language lexicography, both in technological and theoretical terms. This new subfield of lexicography has encountered numerous challenges, related to the structural differences between spoken and sign languages. One of these challenges has been how the issue of dividing words into different parts of speech (POS) should be handled for sign languages.

For both theoretical and sociolinguistic reasons (Linde-Usiekniewicz & Olko 2006, Linde-Usiekniewicz et al. 2014, 2016), the *Corpus-based Dictionary of Polish Sign Language* compiled at the University of Warsaw provides Polish descriptive sense definitions instead of sets of equivalents. Since the morpho-syntax of spoken Polish makes it impossible to adequately define a sense without imposing a POS interpretation on it, we decided to introduce a functional division of senses in the entry structure. Thus, four usage types have been distinguished for PJM (*polski język migowy*, Polish Sign Language), defined by their resemblance to the traditional POS pattern: a noun-like, verb-like, adjective-like, and adverb-like usage. Each of these types of usage was established partly on semantic grounds (Wierzbicka 2000), and partly on syntactic grounds (Meir 2013).

Interestingly, this procedure has also led us to identify usage types with no obvious counterparts in the traditional POS system, namely signs used autonomously, i.e. in a separate utterance.

Keywords: Polish Sign Language (PJM); corpus linguistics; parts of speech; homonymy; polysemy; autonomous use

1 The First Corpus-based Dictionary of Polish Sign Language (PJM)

Polish Sign Language (*polski język migowy* in Polish, often referred to with the acronym PJM) is a natural visual-gestural language that has been evolving within the Polish Deaf community since around 1817 (when the first school for the deaf was established in Warsaw, the capital of Poland). No serious linguistic analyses devoted to PJM were published before the 1990s and it was an under-studied language until very recently (for a review, see Rutkowski & Sak 2016). The situation started to change in the last decade, thanks to a large research project aimed at compiling the first-ever corpus of PJM and producing a comprehensive grammatical description and a corpus-based dictionary of that language (Rutkowski et al. 2013, 2015, 2016).

The online *Corpus-based Dictionary of Polish Sign Language* (Łacheta et al. 2016) stems from the PJM Corpus, which is an extensive collection of video recordings of Deaf users of PJM reacting to more than 20 different elicitation tasks (e.g. retelling the content of picture stories and video clips presented to them during the recording session, naming objects, talking about themselves and their

experiences, discussing various topics pertaining to the Deaf – see Rutkowski et al. 2016). The recording sessions always involve two signers and a Deaf moderator (who is a member of the PJM Corpus project team). The elicitation materials are mostly pictures, video clips, charts, comic strips, etc., with as little reference to written Polish as possible. The participants are also given some time for free conversation (during that phase no specific task is assigned to them but they are aware of being filmed throughout the course of the conversation). This is aimed at collecting fully spontaneous and non-elicited data.

The PJM Corpus project was launched in 2010 (when the recording studio was established and the elicitation procedures started to be developed). The filming and video annotation began in 2011. The data collection phase should be completed in 2016 (with 150 signers recorded) but the data annotation process will continue at least until 2019. The underlying idea behind the PJM Corpus project is to create a database of richly annotated videos showing Deaf signers using PJM in face-to-face conversations.

The group of PJM Corpus participants is intended to be representative of the Polish signing community: they come from different parts of Poland and their selection has taken into account some key sociological variables, such as age, gender, educational background, etc. (the respective metadata forms an integral part of the corpus). The raw video material obtained in the recording sessions is further segmented, glossed (lemmatized), transcribed with the HamNoSys transcription symbols (Hanke 2004), translated into written Polish, and tagged with respect to various grammatical features using the iLex software developed at the University of Hamburg (Hanke & Storz 2008). The annotation conventions employed have been designed especially for the purposes of the PJM Corpus project (Rutkowski et al. 2013, 2016).

Containing many hours of recorded material elicited from a range of individuals, the PJM Corpus makes it possible to ascertain which PJM signs are used by Deaf signers, and how they are actually used. Thanks to that, the *Corpus-based Dictionary of Polish Sign Language* documents and describes real PJM usage (note that all sentential examples used in the dictionary have actually been extracted from the PJM Corpus). The definitions which the dictionary offers are written in Polish and are modelled after the definitions in the monolingual Polish dictionary *Inny słownik języka polskiego* edited by Mirosław Bańko (Bańko 2000). They are written in a way that is akin to the style of definitions to be found in typical monolingual dictionaries, i.e. they provide semantic information that is more extensive and precise than the sort customarily provided in bilingual dictionaries.

The *Corpus-based Dictionary of Polish Sign Language* may be used by those learning PJM as a second language – as a kind of foreign language dictionary, or more precisely, a semi-bilingual foreign language dictionary or a reversed “bridge” dictionary (the idea is explained in more detail in Linde-Usiekniewicz et al. 2016). However, the objective of providing relatively extensive definitions is not only to enable Polish-speaking learners of PJM to understand the precise meaning of a given sign, but also to enable Deaf users of the dictionary to learn to more effectively and accurately interpret the definitions of meanings given in standard monolingual dictionaries of Polish. It should be emphasized that the definitions provided are not those of spoken Polish equivalents (see Zwitserlood 2010 for criticism of how definitions were constructed in early sign language dictionaries). In other words, the *Corpus-based Dictionary of Polish Sign Language* departs from the common practice of using spoken language equivalents instead of descriptive definitions in sign language dictionaries (cf. Kristoffersen & Troelsgård 2010, 2012, Langer et al. 2014).

2 Sign List and Entry Structure

The *Corpus-based Dictionary of Polish Sign Language* includes all the signs that were found to appear in the PJM Corpus more than 4 times. At first glance it may seem that the dictionary covers a relatively limited number of signs (approximately 3000). This is a result of the decision that every sign (i.e. a particular phonological form) will be represented in the dictionary only once, even if it has a very large number of (possibly unrelated) meanings. As in other sign languages, it is usually the case that one PJM sign corresponds to a whole series of interrelated expressions in Polish. For example, a single PJM sign may be translated into Polish as *śmieszny* ‘funny’, *zabawny* ‘fun’, *(dobry) humor* ‘(good) humor’, *kawał* ‘joke’, *dowcip* ‘jest’, *żart* ‘jape’. Nevertheless, when giving Polish equivalents (which accompany the definitions, see below) we did not list a whole series of such closely related expressions, but rather tried to find one expression that most accurately corresponded with the meaning described.

We decided to classify PJM signs included in the dictionary into semantic fields. The appropriate signs are labelled as belonging to a particular field, which means that the fields constitute one of the search criteria for the search engine provided (see below). The semantic fields we decided to take into account are as follows: color terms, body parts, buildings and their parts, language and communication, fruits and vegetables, plants, animals, professions, health and hygiene, clothing, pieces of furniture, time, space, motion and transportation, sports, education. Needless to say, this categorization does not encompass all signs, as many are of such universal meaning that they cannot be assigned to any of the categories. The field distinctions turned out to be a helpful tool in controlling the completeness of the dictionary’s entry list. Namely, having assigned signs to the semantic fields, we noticed a number of obvious gaps (signs that were missing in a given category). This situation resulted from the fact that certain well-established PJM signs happened not to occur in the PJM Corpus recordings (they were not required by the elicitation tasks, nor did the signers use them in their spontaneous utterances). For reasons of completeness, we decided to fill in the most obvious gaps. To this end, we added the basic signs that were missing from each semantic field. Similarly, even when a sign occurred many times in the PJM Corpus, not all of its meanings/uses were necessarily represented there. Our Deaf and CODA (*Children of Deaf Adults*) editors, in consultation with other Deaf individuals, sometimes decided to include additional meanings of individual signs (unattested in the corpus data).

Lexicographic work on spoken languages, particularly Polish lexicography, traditionally draws a clear distinction between cases of homonymy and polysemy (Linde-Usiekiewicz 2011), with series of generally recognized criteria applied simultaneously to distinguish between cases of homonymy and polysemy; these include independent origins, no common meaning, belonging to different parts of speech, etc. In the *Corpus-based Dictionary of Polish Sign Language*, we decided not to introduce such a distinction for both technical and substantive reasons. Firstly, there is no obvious way to formally distinguish homonymous entries (e.g. by adding a numeral to the headword: SIGN1, SIGN2 etc.). In our dictionary, the role of a headword is performed by a sign-language lexeme (represented as a video clip and a HamNoSys transcript – Hanke 2004), and not a Polish gloss, which means that the different meanings of a sign would still have to be listed together in the same entry, under the same headword. Irrespective of whether the sign is considered homonymous or polysemous – the distinction could only be drawn lower, within the entry itself. Secondly, it should be noted that the iconic origins of many sign-language lexemes very often lead to metaphorical and metonymical extensions. As a result, two signs may be performed in exactly the same way, have very different

meanings, but be derivable from a single iconic root. Such cases cannot be claimed to be examples of coincidental correspondence, but neither is there a logical basis for interpreting the sign in question as a single lexeme with multiple meanings. For these reasons, the *Corpus-based Dictionary of Polish Sign Language* does not distinguish between homonymous vs. polysemous elements. In all cases when the meanings of a given sign fall into groups of senses, some of which are closely related, the entry is divided into what are called *macrosenses*, labeled with Roman numerals. Macrosenses may be semantically independent of one another – consider for instance the PJM sign produced with the forefinger tracing a descending line that starts at the middle of the signer’s brow, following the ridge of the nose and ending at the tip of the chin (see Figure 1).

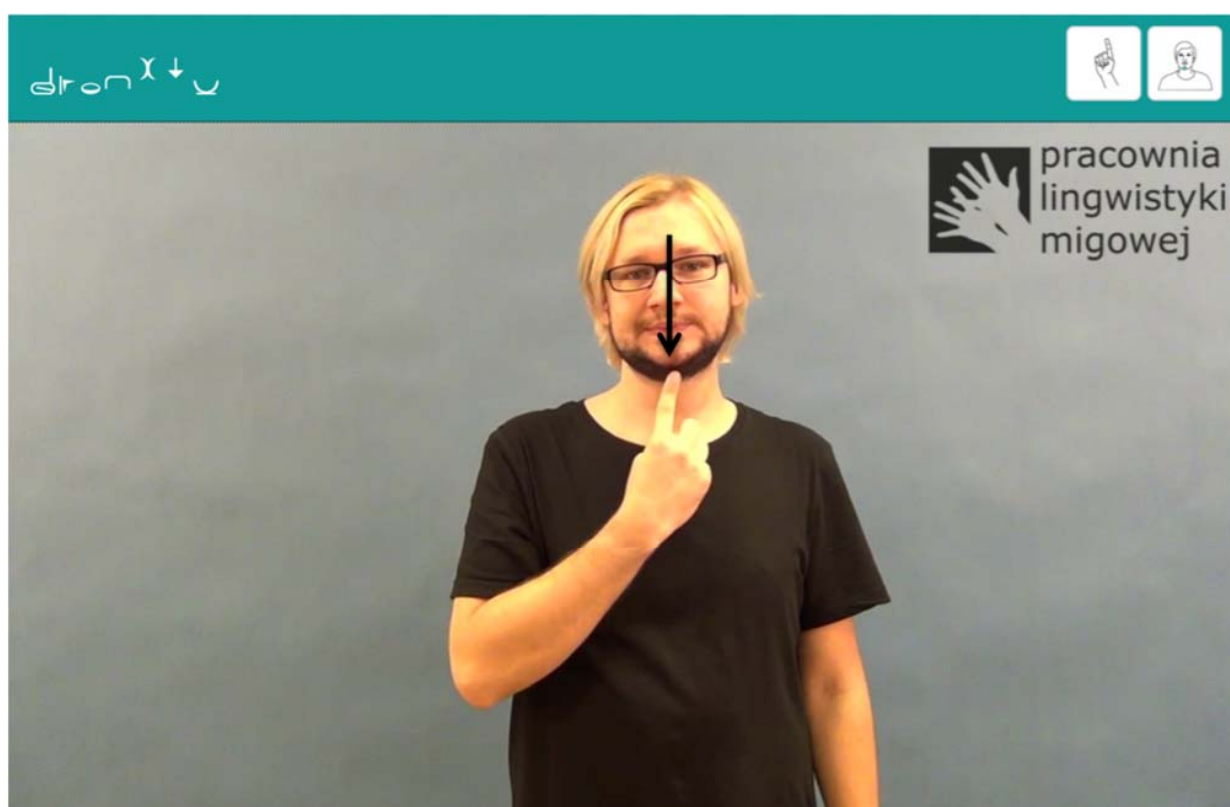



Figure 1: The PJM sign meaning ‘profile’ or ‘Portugal’.

The above sign can mean both ‘profile’ (macrosense I) and ‘Portugal, Portuguese person, Portuguese’ (macrosense II). The two macrosenses are most likely derived from the same iconic source (the motivation for the country’s name is related to the fact the its coastal line resembles a human profile on a map). We treat them as two macrosenses of the same dictionary entry but we restrain from saying whether they should be considered homonyms or not. In some cases, macrosenses are semantically related in a more obvious way, as in the case of the PJM sign that can mean ‘sufficient, enough’ (macrosense I) or ‘a lot’ (macrosense II). The division of meanings into macrosenses was performed based on the linguistic intuitions of the lexicographers.

The dictionary entry is further divided into syntactic categories (see below). Within each category further sense division is established. Each sense is defined in simple terms, based on, but not equivalent to the model adopted in Bańko (2000) (see Linde-Usiekiewicz et al. 2014 for sample definitions rendered in English). For senses that possess a spoken Polish equivalent, such equivalent is given. In some cases the equivalent is not a single word, but an expression. Series of


quasi-synonymous equivalents are avoided whenever possible. Additionally, examples of sentences containing a particular sign are given (under the heading *PRZYKŁADY* ‘examples’ – see Figure 2). The examples are drawn from authentic signed utterances found in the PJM Corpus. For reasons of anonymity, however, the authentic recordings themselves were not imported into the dictionary. Instead, these utterances were re-recorded by Deaf members of the dictionary team. Examples are coupled with macrosenses, not with types of use: as mentioned above, not for all types of use could examples be found in the corpus.


wyloguj się



CORPUS-BASED DICTIONARY OF POLISH SIGN LANGUAGE

HOME / ABOUT PJM / ABOUT THE PROJECT / HELP / SSL
POLSKI / ENGLISH


~ D r e u e (X g) [t y] l l) G r e o]




pracownia
lingwistyki
migowej

w użyciu czasownikowym:
<<odnosi się do czynności polegającej na wyrażaniu wdzięczności za coś>>
dziękować


PRZYKŁADY



pracownia
lingwistyki
migowej

Dzwonię do tłumacza przez telefon z kamerą, on ma słuchawkę, a ja migam do niego, on przez słuchawkę tłumaczy na język foniczny mojemu rozmówcy, a potem miga do mnie i już, dziękuję, wystarczy.

POWIĄZANE

1. 

KLASYFIKACJA

1. kształt dłoni: B.1 (← zobacz wszystkie)
2. lokalizacja: BRODA (← zobacz wszystkie)
3. znak dwuręczny (← zobacz wszystkie)

DODATKOWE

Dodaj do nauki

Lista znaków do nauki

Drukuj stronę

Figure 2: A sample entry in the *Corpus-based Dictionary of Polish Sign Language*.

3 The Dictionary’s Interface and Search Engine

The welcome panel of the dictionary is bilingual in the sense that written Polish texts are accompanied by their PJM translations (video clips). Selected material has also been translated into English (see Figure 3). From this panel the user can access information about PJM, the PJM Corpus and about the dictionary project.

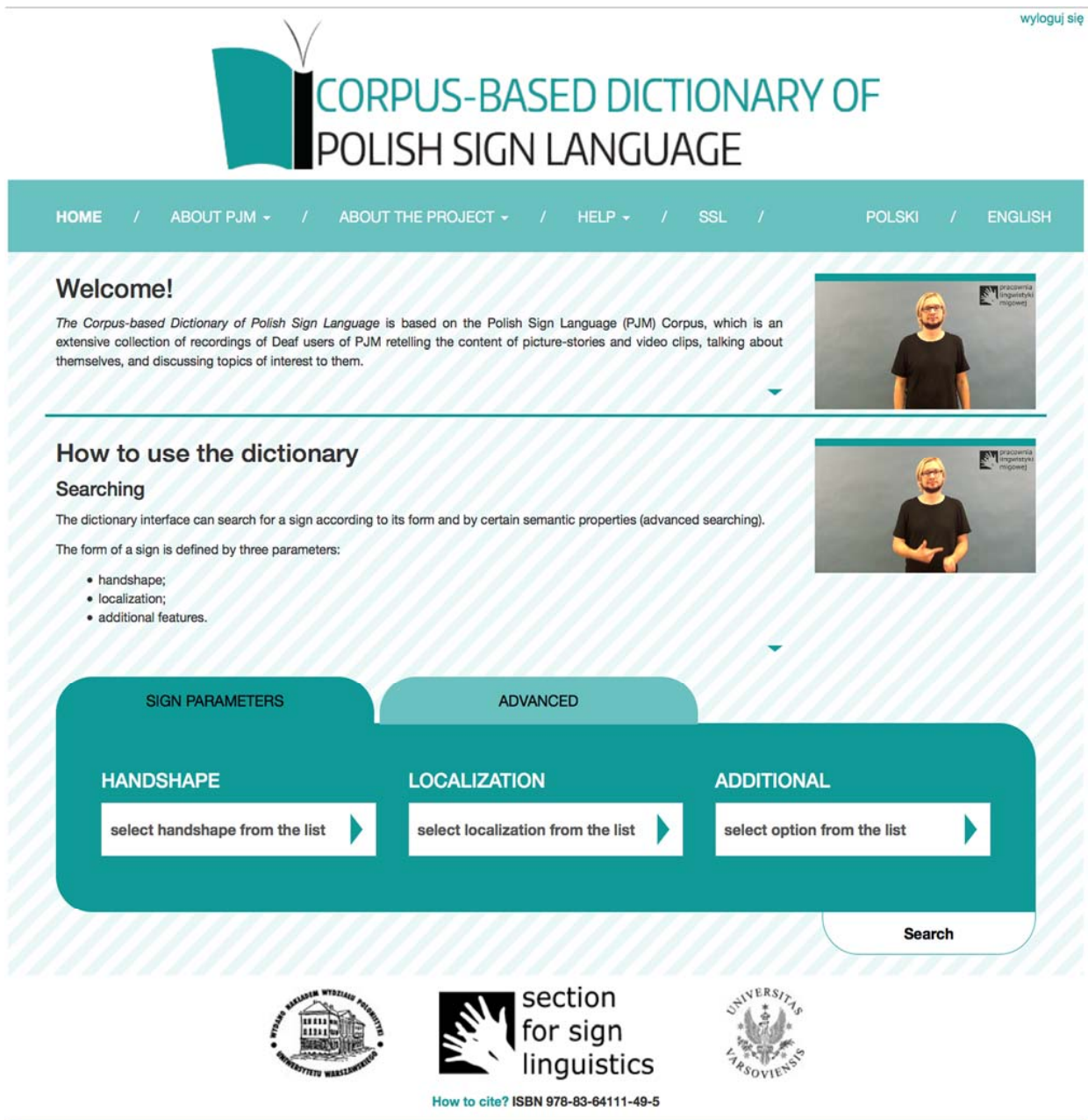


Figure 3: The interface of the *Corpus-based Dictionary of Polish Sign Language*.

The home page provides information on how entries can be accessed. The entries can be searched by their formal features, i.e. primarily by handshape and location on the body, and also by other articulatory features, if applicable (the *Simple search* options are presented in Figure 4).

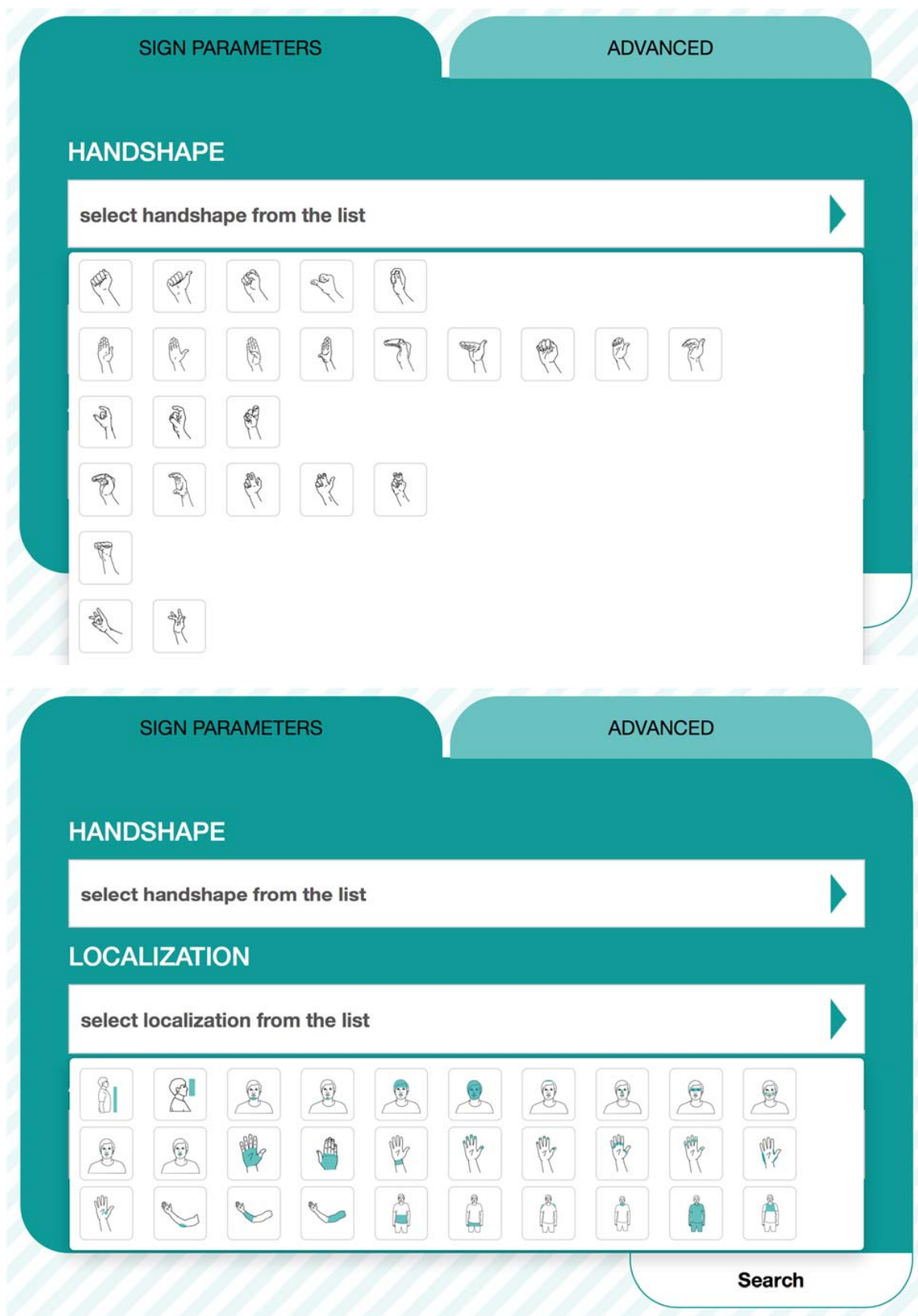


Figure 4: Sample handshapes and locations used in *Simple search*.

However, signs can be accessed on the basis of their semantic and grammatical features, too (*Advanced search*): these include the semantic fields mentioned above, the syntactic category, and the spoken Polish equivalent. Simple and advanced search features can be combined in a single query.

4 The POS Question

The issue of the division into parts of speech (POS) in sign languages has been subject to considerable debate in the literature (see e.g. Schwager & Zeshan 2008). It is a well-known fact that many sign language lexemes are under-specified in terms of their syntactic category, i.e. they may play various sentential roles (e.g. those of predicate, argument, or attribute) without any morpho-phonological modification (see Meir 2013 and references quoted therein). Late 20th-century sign language dictionaries have been criticized for assigning spoken language POS distinctions to signs (Schwager & Zeshan 2008, Zwitserlood 2010). In recent projects, there is a tendency to avoid the POS issue by defining a sign sense in terms of a set of semantically related spoken language equivalents belonging to different POS (Kristoffersen & Troelsgård 2010, 2012, Zwitserlood et al. 2013, Langer et al. 2014).

However, when the descriptive definitions of senses are given instead, as in the case of the *Corpus-based Dictionary of Polish Sign Language*, the POS issue can no longer be eschewed (since written Polish definitions necessary imply a POS interpretation – cf. Linde-Usiekiewicz et al. 2014). On the other hand, the meaning of a particular occurrence of a sign-language lexeme often depends on whether it is used as if it were an adjective, or as if it were a noun or verb. For instance, the same PJM sign when used as a verb means that someone is afraid, whereas as an adjective it means that someone is a coward. In such cases, there is a clear-cut semantic difference, not resulting from simple conversion: someone who is generally brave may feel afraid in a specific situation, whereas someone who is generally cowardly may show exceptional bravery.

To capture these differences, the portion of an entry dealing with a specific macrosense (see above) may be further divided into parts corresponding to syntactic categories, which, for the sake of user-friendliness are presented in the dictionary as simple *types of use*, and identified with capital letters A, B, C (Linde-Usiekiewicz et al. 2014). The specific names of these types of use are drawn from the traditional POS system of spoken Polish, in spite of there being a number of newer competing approaches to the issue of classifying Polish lexemes (e.g. Saloni 1974, Laskowski 1998, Wróbel 1996, Wajszczuk 1999). Thus, if a meaning is identified as having a *nominal use*, the non-native PJM user of the dictionary can safely assume that the sign can be used, in the sense provided by the definition, in a similar way that a spoken Polish noun can.

Yet, as will be shown below, we also found signs whose syntactic description did not easily match any traditional POS of spoken Polish.

5 Counterparts of Traditional POS and Corresponding Definitions

Following the traditional distinction between lexical words and function words, we adopted different defining formulae for the two classes. Thus for the signs used as counterparts of lexical words, the appropriate formula describes the denotation, and the definition begins with the phrase *odnosi się do...* ‘refers to/denotes...’. This procedure is used in the case of signs that are considered ‘noun-like’, ‘verb-like’, ‘adjective-like’, and ‘adverb-like’ (see below).

Function words are generally less numerous in sign languages than in spoken ones, and have lower frequency in signed expressions, because the syntactic links are also provided by the use of the signing space, mimicry, body position, head position, gaze direction, etc. Still, there are some PJM lexemes that do correspond to function words in spoken languages. The *Corpus-based Dictionary of Polish Sign Language* marks signs that may be used in this way with the following phrases: ‘in pronominal use’, ‘in conjunctive use’, ‘in prepositional use’, ‘in particle use’, and the corresponding definitions contain the phrase ‘is used to...’ (*służy do...*). Denoting signs (traditional parts of speech/lexical words) and functional signs may combine together to form sentences.

The type of use corresponding to a lexical word (i.e. the nominal, verbal, adjectival and adverbial uses) are generally determined on semantic grounds (Wierzbicka 2000). However, some syntactic criteria have also been employed. Thus *verbs* are identified because they refer to an activity, process or state, i.e. any situation (the general notion of situation as an umbrella term for verbal reference is similar to that found in Mel’čuk 1996 or Mel’čuk et al. 1995, 1999). In consequence, no provision is made for nominalizations: either verbal nouns or derived nouns denoting activities. It should be noted however, that in definitions of verbs the terms ‘activity’, ‘action’, and ‘situation’ are used in their ordinary senses. Verbal uses may include lexicalized “classifier predicates” (Linde-Usiekiewicz & Łozińska 2016) and signs naming activities or actions that are referred to with phrasal constructions in spoken Polish, such as the sign meaning ‘work hard’, which is based on the sign ‘horse’, to express that someone works as hard as a farm-horse (compare the Polish expression *pracować jak wół* ‘to work like an ox’).

Nominal use of a sign is determined first of all on the basis of its sense, but also on syntactic grounds: one criterion taken into account is combining with the possessive sign (which is different from the indexing sign used to establish reference, and different from the verbal sign conveying the idea of possession) and the other is being used as a syntactic argument of a verb.

Adjectival use means that a sign is used to refer to some property of an individual, phenomenon, or thing. The syntactic criterion relates to being used attributively, i.e. as a modifier, forming a unified noun phrase, or predicatively.

Adverbial use means that a sign is used to characterize some activity or action. It therefore combines with signs used verbally. Such use is established on the basis of both sense and syntactic properties. The last lexical POS is that of numerals, which comprises signs that are used as cardinal numerals (‘three’, ‘four’) or as ordinal numerals (‘third’, ‘fourth’). Modified signs, in which a numeral handshape is incorporated into a lexical sign (‘third floor’, ‘third form’, ‘three kilos’, ‘five hours’, etc.), are treated as nominals.

The functional uses corresponding to the traditional functional POS categories comprise:

Pronominal use – the signs thus labelled are very diverse in terms of their syntax. What they have in common is the fact that what they refer to cannot be ascertained out of context. This class includes demonstratives (points), interrogatives and possessives, among others. The definitions of such signs describe what purposes their uses serve.

Conjunction use – the sign is used to join together expressions and clauses that are relatively similar to one another grammatically, and to communicate what relationship between them the signer wishes to convey. The definitions describe these properties.

Prepositional use – most of the spatial relations expressed by prepositions in spoken Polish, such as ‘over’ (*nad*), ‘under’ (*pod*), ‘alongside’ (*przy*), are expressed in PJM, as in other sign languages, by simply articulating the signs referring to the two entities at appropriate locations within the signing space. Nevertheless, PJM does have a number of signs that may be considered equivalents of spoken

language prepositions. They may be used to express abstract relations between two signs and/or expressions, usually relatively different grammatically from each other.

Particle use – in the traditional POS system, *particle* is an umbrella term, adopted for the sake of simplicity. The class consists of expressions that serve to comment on, or to fine-tune the meaning of the utterance they are part of (see e.g. Grochowski et al. 2014). For the purposes of the *Corpus-based Dictionary of Polish Sign Language*, it is assumed that unlike adjectives, which combine with nouns, or adverbs, which combine with verbs and adjectives, particles do not have specific combinatorial restrictions. The class also includes various discourse markers, which can be integrated into utterances.

6 Special Uses of PJM Signs with no Traditional POS Counterparts

Interestingly, the procedure presented above has led us to establishing some usage types that have no obvious counterparts in the traditional POS system. Our analysis of the corpus material shows that there are signs which are used autonomously, i.e. in a separate utterance that is non-elliptical (no other signs can be attached to it). Some of these signs have no other uses, while others acquire different meanings when used on their own. Functionally, some of them may resemble exclamations, such as *Aha!* or *Bravo!* Others may be analyzed as corresponding to what has been called *nonsententials* (Progovac et al. 2006, Progovac 2013). However, in contrast to expressions like *Agreed! Correct!* in English or *Zgoda!* (‘agreed’, lit. ‘agreement’), *Szkoda!* (‘what a pity’ lit. ‘damage’) in Polish, they cannot be considered instances of elliptical sentences as they are not adjectives or nouns that could be integrated into larger constructions, such as *That is correct!*

Instead of identifying such signs with a general class of interjections (another umbrella term covering a large range of heteronomous expressions) we decided to identify this use as *autonomous*, by which we understand that the sign in question necessarily constitutes an utterance on its own, and never combines with other signs to form more complex constructions. Such PJM lexemes seem to fulfil multiple communicative functions. In Jakobson’s (1960) terms we could classify them as related to the conative function (engaging the addressee directly) and the phatic function (focused on interaction: opening, maintaining and closing the communication channel). In some cases they do not match any of Jakobson’s (1960) functions, and can be tentatively identified with meta-textual elements of discourse (Wierzbicka 1971, Wajszczuk 2005). In particular, there seems to exist a group of PJM signs that are used exclusively as commentaries on previous utterances, either produced by the signers themselves or by their interlocutor. A good example of such a sign (which actually happens to have two distinct macrosenses) is presented below (Figure 5). In one of its macrosenses, it corresponds to the numeral ‘one’, while in the other it expresses agreement or positive response to what the other signer has uttered (a yes/no question or a proposal).



Figure 5: An autonomous sign meaning ‘OK’.

Another type of autonomous PJM signs includes those by which the signer intends to influence the audience’s behaviour. By using such a sign, the signers may, for instance, ask somebody to turn towards them (or to make other people present turn toward them, so that visual communication can be established – the sign is illustrated in Figure 6).



Figure 6: An autonomous sign used in order to attract attention.

7 Conclusion

This paper presents an outline of the most important aspects of the structure and contents of the online *Corpus-based Dictionary of Polish Sign Language*, which has recently been created at the University of Warsaw. We discussed the dictionary's empirical basis (the PJM Corpus), the procedures that led to the compilation of its entry list, and the details of the adopted entry structure. The paper also addressed our key methodological decisions concerning the form of definitions used in the dictionary, as well as the user interface and search engine. Special attention was paid to the issue of the division of signs into parts of speech (POS). We discussed to what extent the traditional POS system is adopted in the *Corpus-based Dictionary of Polish Sign Language*.

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Acknowledgements

This research has been supported financially by the Polish Ministry of Science and Higher Education (under the National Programme for the Development of Humanities in 2014-2019, grant number: 0111/NPRH3/H12/82/2014) and by the National Science Centre, Poland (under the HARMONIA program, grant number: 2011/01/M/HS2/03661). The authors are also grateful to Daniel J. Sax, Anna Kuder and Joanna Filipczak for their help with the preparation of this paper.