How mouthings interplay with sign morphology. Cross-modal strategies for inflectional marking in Hungarian Sign Language

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Abstract. The paper focuses on the cross-modal expressions of inflectional marking found in Deaf bilingual Hungarian Sign Language users. To date there have been various findings on mouthings in sign languages. However, the impact of spoken morphology on mouthings gained far less attention and has never been studied systematically. The research on Hungarian Sign Language (Magyar Jelnyelv, MJNY) is devoted to expand our horizon in this regard. In doing so, it has been exploring unique cross-modal contact phenomena in the Deaf bilingual community in Hungary. An in-depth data analysis of six informants carried out in the framework of a DFG postdoctoral research project at the University of Pannonia in Hungary indicates that signers not only make use of spoken inflections such as Person or Number in a signed discourse, but to some extent synchronize them with manual inflectional markers.

Keywords. mouthings, inflectional morphology, bilingualism, multimodality
1. Introduction

The present research has been carried out within the scope of a postdoctoral project at the University of Pannonia between 2017-2020, supported by the DFG (Deutsche Forschungsgemeinschaft). This study extends on my previous research on mouthings in Hungarian Sign Language (MJNY). In Racz-Engelhardt 2016 I showed that signers produce visual forms of spoken Hungarian inflectional markers in their spontaneous mouthings within an informal MJNY discourse.

This phenomenon has been object of my observation for over 10 years. I have been especially interested in mouthings with spoken Hungarian inflections. It is because Hungarian is very rich in inflectional paradigms in contrast to other languages in the literature on sign language mouthings.

Around the years of 2008 to 2010, during a time of regular interaction with numerous members of the Deaf community in Hungary, it was possible for me to observe this phenomenon the first time more closely. Based on experiences from that time and the discussion of this subject with other sign language competent persons, it is clear that there are specific mouthing forms in MJNY which resemble inflected spoken Hungarian words, for example:

‘autó’ [car] vs. ‘autóval’ [by car] or ‘autónk’ [our car].

These occurrences are unique because they are strongly bound to spoken Hungarian, including its grammatical characteristics, while occurring in the morphosyntactic environment of a sign language. This constitutes a very specific type of language contact.

Similarly to other sign languages, mouthings frequently accompany manual signs in MJNY as well. This statement can be easily confirmed by examining the various MJNY texts available in the public domain. After the doctoral thesis on mouthings (Racz-Engelhardt

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1 The following paper has been part of the research project: Untersuchung zur bimodalen Kapazität der menschlichen Sprache – Eine sozio-linguistische Studie zu Sprachkontakten in der Ungarischen Gehörlosengemeinschaft. Postdoctoral grant by the DFG (Deutsche Forschungsgemeinschaft), RA 2967/2-1
I became interested in the question whether signers can express inflectional meaning by simultaneous combinations of signs and mouthings in their natural utterances – given the fact that both languages exhibit inflectional morphology.

This study is the first analysis of these bilingual utterances. As an introduction to the subject matter, let us look at example (1) which shows that MJNY can involve different articulators to overtly mark Person and Number.

(1)

\[
\text{szeret-em}
\]

like-1SG.(DEF.3SG)

\begin{equation}
\text{LIKE AUX1-x}
\end{equation}

'I like him/her'

The sign SZERET (“like”) together with the verbal auxiliary element AUX bears the meaning I like him/her. The sign SZERET is a plain verb, it doesn’t show inflection for Person and Number in MJNY. The first person singular subject and the non-first person singular object are formally defined through the insertion of the AUX sign (carried out from first person to non-first person in the signing space, indicated by 1-x).

The mouthing ‘szeretem’ is an inflected form of the Hungarian verb szeret (“like”); the suffix -em marks first person singular. It also expresses a definite third person object. In this way the mouthing ‘szeretem’ and the sign AUX together with other non-manuals mark the first person subject and the third person object. Moreover, the
5. List of abbreviations

Manual and nonmanual forms:

ALT: Alternating repetition
ARC: Arc movement
BS: Body-shift
PC: Puffed cheeks
REP: Exact repetition

Sign languages:

ASL: American Sign Language
AUSLAN: Australian Sign Language
DGS: German Sign Language
LSC: Catalan Sign Language
LSF: French Sign Language
TİD: Turkish Sign Language

6. References

Aaron, Uche E. 1996/97. The category of number in Obolo verbal morphology. Journal of West African Languages 26(1), 49-76.
mouthing explicitly expresses that the subject refers to a definite entity.

According to the main hypothesis, such examples are part of the bilingual language use in the Deaf community. Signers choose to express inflectional meaning (e.g. Person or Number marking) by various, temporally synchronized combinations of manual signs and spoken Hungarian inflections, latter indicated through the nonmanual component mouthing. Grammatical information comes from two source languages of different modalities: visual-gestural and auditory-vocal.

2. Research background

2.1 Mouthing in Sign Languages

Sign linguists distinguish two main types of mouth actions. According to a common sense definition, mouthing are visual mouth movements in a sign language that originate in and are associated with the surrounding spoken language. In that, they are in contrast to mouth gestures, which are another type of mouth actions that emerge from the sign language itself. (Boyed Bream and Sutton-Spence 2001). In many sign languages, mouthing frequently accompany manual signs. For various subgroups of mouth gestures see Crasborn et al. (2008).

The word “mouthing”, in simple terms, refers to those visually perceivable mouth and lip movements of a signer which are produced when he or she silently utters words of a spoken language. This mechanism is not equivalent to silent speech as signers usually shorten and modify these movements of the mouth to fit the manual signing flow. But through lip-reading, it is possible for an interlocutor to infer the intended spoken words from the visual information (Bank et al 2011; Engelhardt 2018). The case of mouthing is a hot potato in sign linguistics because it raises the fundamental question to what extent sign languages are intertwined with spoken language production (cp. Crasbron 2016).

There have been controversial scholarly approaches to find out whether mouthing belongs to a sign language system or is merely a
contact phenomenon in certain sign discourses where a spoken language is also dominantly present. However, this dualistic view fails to capture the actual reality of bilingual signers where these two systems are highly entangled.

Mouthings have been widely discussed in the context of language contact and bilingualism. Following the terminology of this field of research, today we can speak about mouthing being an example of cross-modal language contact. It occurs when a primary sign and primary spoken linguistic system interact which gives rise to features undocumented in spoken languages.

Lucas and Valli (1992), and Schermer (1990) described different sign varieties or types of sign language use that result from the spoken influence and co-exist with sign languages but differ from the way of vernacular, authentic sign language use among deaf people.

In this context they demonstrated on empirical data that mouthings also show various degrees of influence from spoken language. A more spoken-language-oriented signing uses mouthings which are, in their visual formal characteristics, closer to words; in contrast, mouthings in the vernacular sign language used among Deaf people are often modified in form and function.

In the 1990s, on the pages of the German journal, das Zeichen, a series of articles discussed whether mouthings are part of German Sign Language or not. The discussion generated the need to have a closer look at this phenomenon. Most of the views were reflected in the Hands are the Head of the Mouth volume (Boyes Bream and Sutton-Spence 2001).

In most of the studies, there is a reoccurring underlying theme. This has to do with the nature and status of mouthing in sign languages which is still not fully understood. Although many contributions acknowledge the continuum nature between a sign and spoken system, all the arguments come down to one single question: Can we see mouthing as part of a sign language system or is it rather a phenomenon caused by cross-modal language contact? Another way of asking the same question: Has mouthing been adapted to a sign language, being now part of its semiotic framework, or does it run as a separate linguistic code during signing?
If one takes the time to look at the various descriptive, socio-psycho and neurolinguistic studies on mouthing, one has to admit: there is empirical evidence for both possibilities.

In my view, this leads to permanent confusion, which can only subside if we understand the interconnectedness of language systems in bilinguals. This paper rather emphasizes the flexible and heterogeneous nature of a bilingual repertoire allowing elements from different systems to intertwine and interact in a discourse.

As it has been already outlined by previous studies, if mouthings are borrowed from spoken languages, they usually show the citation form of the corresponding words or get reduced in morphological features (Bauer 2019). Thus, based on the literature, spoken inflections are not expected to show up frequently in spontaneous vernacular sign language use. We know relatively little about this specific issue, thus, those papers which mention this phenomenon in other sign languages were quite valuable for the present research.


In contrast, Zeshan (2001) found for IPSL that more extensive use of mouthings including inflections for gender, person, number or tense, can occur with IPSL grammar; nevertheless they are rather exceptions (2001:253).

Akin to Zeshan, Mohr (2012, 2014) also discusses spoken inflections in Irish Sign Language as one of many types of mouthings found in ISL. She provides examples of tense marking on verbs and plural marking on nouns. Based on Emmorey et al (2008) and Baker & Van den Bogaerde (2008) she argues that in ISL spoken inflections can co-occur with sign structures indicating congruent morphological marking. For example: The same temporal reference or pluraliza-
How mouthings interplay with sign morphology

As in the mouthing. She draws attention to the fact that the examples of semantic and morphological congruence appeared in ISL in a rather monolingual sign language setting not in bilingual discourses (2014: 76).

Bank et al. (2011) mention spoken inflections in the NGT corpus in the explanation of temporal reductions of mouthings. Infinitive suffixes (-en/) in mouthings can be replaced by inflected forms for first, second or third person: e.g., ‘zeggen’ (‘to say’) reduced to ‘zeg’ (“say”) or ‘zegt’ (“says”). The final consonant in these cases are usually not clearly visible (2011: 264). Similarly, the sign CAN frequently co-occurs with Dutch mouthings indicating formal or informal second person marking: ‘kan’ or ‘kunt’ (ibid).

Although the authors did not focus on grammatical context, they assume it would provide more evidence for the bilingual activation of NGT and Dutch if alignment of spoken inflections with morphological properties of NGT were investigated further (2011: 264).

Boyes Bream (2001) also suggest this type of morphological combination of sign and spoken language to be worthy of detailed analysis in DSGS. She suggests the investigation of conflict sites (the same functions in two languages with respectively different markings) (2001:124).

To sum up, spoken inflections in sign language production were reported from several sign languages. Usually, they are associated with code-mixing and bilingual discourse rather than borrowings in a sign language. Nevertheless, there are documented cases from ISL, NGT, IPSL and DSGS for this phenomenon. Importantly, these limited findings indicate the possibility that spoken inflections can also co-occur with inflected manual verbs and nouns of the respective sign language resulting in both semantic and morphological congruence. At the same time we can assume that such grammatical congruence is very atypical in sign languages.

2.2 Inflectional morphology in Hungarian: A sketch

MJNY, unlike other European sign languages, borrows mouth forms from the surrounding spoken language, Hungarian, which is a Finno-Ugric language with rich inflectional morphology (Kiefer 2000).
Therefore, it was reasonable to assume that the bilingual situation in Hungary gives rise to a wider range of inflectional markers in mouthings than it can be observed in other sign languages. This definitely expends our knowledge on what is possible in a sign–spoken contact situation. In order to bring the detailed findings closer to the international audience, in the following a short overview of Hungarian inflectional morphology is presented focusing on some crucial paradigms that are used by the informants of this study.

**Person and Number on verbs, auxiliaries and infinitives**

In Hungarian, Person follows a three-value paradigm: 1\textsuperscript{st}, 2\textsuperscript{nd} and 3\textsuperscript{rd}. Number is expressed morphologically through two values: singular (as ∅ morpheme) and plural.

There is an elaborate system of Person-Number marking on Hungarian verbs. These paradigms are in fact products of the tight connection to personal pronouns and their grammaticalization.

In these paradigms, the two inflectional categories Person and Number are expressed as cumulative exponents in a single morph and referred to as Person-Number markers. For example, játz\textit{unk} “let’s play” contains Person and Number in the single morph -\textit{unk}.

The Person-Number morphs contain a variety of formal realizations; a full account of their representation and the underlying inflectional rules go way beyond the scope of the present sketch. For this reason, this summary is restricted only to demonstrating some usual characteristics that apply to a wide range of Hungarian verbs.

Hungarian distinguishes a general or indefinite paradigm from a definite paradigm. In the latter, the conjugation refers to, beside the subject, a third person definite object. The former is used in every other case (cp. Kiefer 2000:603–604).

In addition, there is a paradigm of the so-called -\textit{ik} verbs, which in singular disagrees with the general form as well. This contains some frequent verbs like eszik “eat”, iszik “drink”, alszik “sleep” or játzik “play”. Most verbs have consonant-final stems to which the markers are attached after a harmonizing vowel. This results in various phonological variants.
The following table shows some possible forms of the present indicative of the indefinite, definite and -ik paradigms.

**Table 1: The three verb conjugation types in Hungarian**

<table>
<thead>
<tr>
<th></th>
<th>Indefinite (general)</th>
<th>-ik</th>
<th>Definite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Sg</td>
<td>-ok, -ek, -ők</td>
<td>-om,-em,-öm</td>
<td>-öm,-em,-öm</td>
</tr>
<tr>
<td>2Sg</td>
<td>-(a)sz/-ol</td>
<td>-od,-ed,-őd</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-(e)sz/-el</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-(e)sz/-ől</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3Sg</td>
<td>-ő</td>
<td>-ja,-i</td>
<td></td>
</tr>
<tr>
<td>1Pl</td>
<td>-unk,-ünk</td>
<td>-juk,-jük</td>
<td></td>
</tr>
<tr>
<td>2Pl</td>
<td>-(o)tok,-(e)tek,-(ő)tők</td>
<td>-játok,-itek</td>
<td></td>
</tr>
<tr>
<td>3Pl</td>
<td>-(a)nak,-(e)nek</td>
<td>-ják,-ik</td>
<td></td>
</tr>
</tbody>
</table>

The other set of conjugations includes Person-Number marking after preceding Tense and Mood inflections. The category Tense is inflected only for the past (future is expressed analytically in Hungarian). Mood contains two marked values: conditional and imperative.

Kiefer (2000) demonstrates that, without the harmonizing vowels, which are there to stress the base and make the paradigms easily distinguishable, the actual Person-Number markers show great similarities that apply to most verb forms.

The following are in indefinite paradigm: -k, -l, m, - Ő, -nk, -tVk, -nak. Those in the definite paradigm include: -m, -d, -a/-e, -k, -tVk, -k (2000:612).

Lastly, the conjugation of the infinitive and some common auxiliary verbs has to be mentioned because they also occur in the mouthing data.

Auxiliary verbs that co-occur with nominals (so called copulas) enable them to take the function of predicates. Such are the auxiliary verbs *van* and *lesz*, which are roughly identical in usage with the English verb “be”. *Van* refers to the present, *lesz* to the future:

(2) Éhes vagyok – Éhes leszek

‘I am hungry – I will be hungry’
These auxiliaries do not make up a full verbal paradigm. However, the two highly common elements are used together in a suppletive way to cover the whole set.

Table 2: The suppletive paradigms of the copula “be” (van, volt, lesz)

<table>
<thead>
<tr>
<th></th>
<th>Indicative</th>
<th></th>
<th>Conditional</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Present</td>
<td>Past</td>
<td>Present</td>
<td>Past</td>
</tr>
<tr>
<td>1Sg</td>
<td>vagyok</td>
<td>voltam/lettem</td>
<td>volnék/lennék</td>
<td>lettem volna</td>
</tr>
<tr>
<td>2Sg</td>
<td>vagy</td>
<td>voltál/lettél</td>
<td>volnál/lennél</td>
<td>lettél volna</td>
</tr>
<tr>
<td>3Sg</td>
<td>van</td>
<td>volt/let</td>
<td>volna/lenne</td>
<td>lett volna</td>
</tr>
<tr>
<td>1Pl</td>
<td>vagyunk</td>
<td>voltunk/lettünk</td>
<td>volnánk/lennénk</td>
<td>lettünk volna</td>
</tr>
<tr>
<td>2Pl</td>
<td>vagyok</td>
<td>voltatok/lettetek</td>
<td>volnátok/lennétek</td>
<td>lettetek volna</td>
</tr>
<tr>
<td>3Pl</td>
<td>vannak</td>
<td>voltak/lettetek</td>
<td>volnának/lennénk</td>
<td>lettek volna</td>
</tr>
</tbody>
</table>

As can be seen in the table, some parallel forms exist as well in past and present. The meaning and usage of them, however, are not dealt with in this short overview.

The infinitive that appears in the aforementioned analytical constructions with auxiliaries is derived from the lexical verb by the -ni suffix. It has a verbal meaning but does not function as predicate itself. The infinitive serves as the grammatical subject of the Hungarian sentence and can be optionally marked for Person and Number. In this case, the marker resembles the inflection of the base verb and, in this way, establishes the relationship to the subject (cp. Korchi-máros 2009:145–146). Example 3 shows the infinitive without a Person-Number marking. Example 4 displays the same sentence with the optional inflection.

(3) Hamarosan indulni kell

‘We must leave soon.’
How mouthings interplay with sign morphology

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(4) Hamarosan indulunk kell
'We must leave soon.'

In addition to its role in the sentence, this Person-Number marking paradigm also connects the infinitive with nouns rather than verbs. It follows a very similar pattern to possessive person markers.

The marking follows vocal harmony rules and results in different alternations. The -i from the -ni derivational suffix is mostly deleted, while the Person-Number marker is attached to the full suffix only in the third person. The table below shows examples of marked infinitives with different phonological realizations.

Table 3: Exemplary inflectional markers on infinitives

<table>
<thead>
<tr>
<th></th>
<th>beszélni</th>
<th>dolgozni</th>
<th>segíteni</th>
<th>venni</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Sg</td>
<td>beszél</td>
<td>dolgoz</td>
<td>segíte</td>
<td>venn</td>
</tr>
<tr>
<td>2Sg</td>
<td>beszél</td>
<td>dolgoz</td>
<td>segíte</td>
<td>venn</td>
</tr>
<tr>
<td>3Sg</td>
<td>beszél</td>
<td>dolgoz</td>
<td>segíte</td>
<td>venn</td>
</tr>
<tr>
<td>1Pl</td>
<td>beszél</td>
<td>dolgoz</td>
<td>segíte</td>
<td>venn</td>
</tr>
<tr>
<td>2Pl</td>
<td>beszél</td>
<td>dolgoz</td>
<td>segíte</td>
<td>venn</td>
</tr>
<tr>
<td>3Pl</td>
<td>beszél</td>
<td>dolgoz</td>
<td>segíte</td>
<td>venn</td>
</tr>
</tbody>
</table>

If the noun or pronoun subject also occurs in the sentence, it has to agree with the infinitive in Person and Number. In that case, the noun or pronoun shows the dative case -nak/-nek. It also hints at the fact that the inflection of the infinitive is nominal and not verbal (Korchmáros 2009:144):

(5) Péternek mennie kell
'Péter must go.'

(6) Nekem se szabad innom
'I am not allowed to drink either.'

**Person and Number on nouns and in nouns phrases**

Nouns overtly realize the plural morpheme through three allomorphs: -k, -i and -ék. The first one, -k, is the general, unmarked form also known as the absolute or homogenous form. It expresses
multiplication (Korchmáros 2009:82). Note that if nouns are modified by quantifiers, they cannot be marked for plural (see example below).

(7) ajtó – ajtók  
    ‘door – doors’

egy ajtó – három ajtó

‘one door – three doors’

Depending on the phonological structure of the base (ending in vowels or consonants, vocal harmony rules), the -k marker appears in different combinations with vowel insertion (-ak, -ok, -ek, -ök). According to the terminology in Matthews (1991), it is a case of phonologically influenced alternation, however, as Kiefer (2000) points out, these are not considered to be allomorphs on their own (2000:588).

Possible plural forms with examples are shown in Table 3.1.

Table 4: Realisation patterns of the plural marker -k

<table>
<thead>
<tr>
<th>-k</th>
<th>-ok</th>
<th>-ak</th>
<th>-ek</th>
<th>-ök</th>
<th>-ek</th>
<th>-ek</th>
</tr>
</thead>
<tbody>
<tr>
<td>almák</td>
<td>asztalók</td>
<td>szamarák</td>
<td>kések</td>
<td>körökök</td>
<td>kövek</td>
<td>termék</td>
</tr>
<tr>
<td>apples</td>
<td>tables</td>
<td>mules</td>
<td>knives</td>
<td>circles</td>
<td>rocks</td>
<td>class-rooms</td>
</tr>
</tbody>
</table>

Following the same phonological patterns, adjectives and demonstrative pronouns are assigned the -k marker from the noun in a noun phrase agreement.

(8) Ez a ház szép  
    ‘This house is nice.’

Ezek a házak szépek

‘These houses are nice.’

The other plural marker, -i, is much more specified in usage. It occurs only in possessive relationship and refers to more than one posses-sum:

(9) kertje vs. kertjei
    ‘his/her garden vs.
    ‘his/her gardens’

Ez Péteré – Ezek Péteréi
    ‘This belongs to Péter vs.
    ‘These belong to Péter’

In contrast to the multiple plural marker -k, the last plural allo-morph, -ék, expresses heterogeneous or additive plurality (Korch-máros 2009:82). It identifies the speaker and his/her associates similarly to the first person plural pronoun mi = én + mások "we = me + others". The named person is a member of the group. The marker can
be used for any group with which the speaker is familiar, often referring to his/her relatives:

(10) Kovácsék  Mariék  apámék  ügyvédék
‘the Smiths’  ‘Mary’  ‘my father+ family/group’  ‘the lawyer and his/her associates’

The above rules also apply to any nominalized word, regardless of original word class. For example, adjectives or numerals, if nominalized, can also show plural markings:

(11) az első  ezek a csúnyákéi
‘the first ones’  ‘these belong to the ugly ones’

The morphological expression of the categories Person and Number is also revealed by the possessive personal marker in noun phrases. The possessed object agrees in Person and Number with the possessor, which is a noun (3rd person) or a pronoun (1st 2nd or 3rd person). In this paradigm as well, the two categories are expressed as cumulative exponents in a single Person–Number morph. An example of agreement is shown in Table 5.

Table 5: Possessive Person–Number markers

<table>
<thead>
<tr>
<th>Singular possessor</th>
<th>Plural possessor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td></td>
</tr>
<tr>
<td>az (én) autóm &quot;my car&quot;</td>
<td>a (mi) autómk &quot;our car&quot;</td>
</tr>
<tr>
<td>2nd</td>
<td></td>
</tr>
<tr>
<td>a (te) autód &quot;your car&quot;</td>
<td>a ti autótók &quot;your car&quot;</td>
</tr>
<tr>
<td>2nd</td>
<td></td>
</tr>
<tr>
<td>az (őn) autója &quot;his/her car&quot;</td>
<td>az őnomk autója &quot;your car&quot;</td>
</tr>
<tr>
<td>3rd</td>
<td></td>
</tr>
<tr>
<td>az (ő) autója &quot;his/her car&quot;</td>
<td>az (ő) autójuk &quot;their car&quot;</td>
</tr>
<tr>
<td>3rd</td>
<td></td>
</tr>
<tr>
<td>Péter autója “Péter’s car”</td>
<td>Péter és Mari autója “Péter’s and Mari’s car”</td>
</tr>
</tbody>
</table>

Person and Number are not morphologically marked on pronominal possessors; the marking is carried by the agreeing possessed noun, with the exception of the second person formal pronoun in plural. In this case, the plurality is only indicated by the pronominal possessor and not by the possessed noun (Korchmáros 2009:125). The following table shows different realizations of the possessive personal marker on stems with different phonological structures. The
examples are based on the segmentation of Kiefer (cp. 2000:595–596). Note that in second person formal and third person, the ending -ja stands for the possessive morph; not for the personal marker. For an alternative segmentation, see Korchmáros (2009).

**Table 6**: Possessive personal markers with various phonological realizations

<table>
<thead>
<tr>
<th></th>
<th>hajó “ship”</th>
<th>ház “house”</th>
<th>kéz “hand”</th>
<th>pad “bench”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Sg</td>
<td>hajó<strong>m</strong>/hajó<strong>im</strong></td>
<td>háza<strong>m</strong>/háza<strong>im</strong></td>
<td>kezé<strong>m</strong>/keze<strong>im</strong></td>
<td>padom<strong>m</strong>/padjaim<strong>m</strong></td>
</tr>
<tr>
<td>2Sg</td>
<td>hajó<strong>d</strong>/hajó<strong>id</strong></td>
<td>háza<strong>d</strong>/háza<strong>id</strong></td>
<td>keze<strong>d</strong>/keze<strong>id</strong></td>
<td>padod<strong>d</strong>/padjaid<strong>d</strong></td>
</tr>
<tr>
<td>3Sg</td>
<td>hajója/hajói</td>
<td>háza/házaí</td>
<td>keze/kezeí</td>
<td>padja/padjai</td>
</tr>
<tr>
<td>1Pl</td>
<td>hajó<strong>nk</strong>/hajó<strong>ink</strong></td>
<td>házu<strong>nk</strong>/háza<strong>ink</strong></td>
<td>kezú<strong>nk</strong>/keze<strong>ink</strong></td>
<td>padunk<strong>nk</strong>/padjaink<strong>nk</strong></td>
</tr>
<tr>
<td>2Pl</td>
<td>hajó<strong>tok</strong>/hajó<strong>itok</strong></td>
<td>háza<strong>tok</strong>/háza<strong>itok</strong></td>
<td>kezetek<strong>e</strong>/keze<strong>itek</strong></td>
<td>padotok<strong>tok</strong>/padjaitok<strong>tok</strong></td>
</tr>
<tr>
<td>3Pl</td>
<td>hajóju/hajói<strong>k</strong></td>
<td>házu<strong>k</strong>/háza<strong>ik</strong></td>
<td>kezúk/keze<strong>ik</strong></td>
<td>padjuk/padjai<strong>k</strong></td>
</tr>
</tbody>
</table>

It can be seen that the plural marker -i is inserted between the lexical stem and the Person–Number marker.

**Person and Number on pronouns and adverbs**

In relation to Person–Number marking, the formal characteristics of pronouns and person-marked adverbs deserve mentioning here. Hungarian features a rich and heterogeneous set of paradigms related to personal pronouns. In nominative, they can serve as the subject of a sentence; they cannot take inflections for other syntactical functions. An exception is the accusative form, which reveals a suppletive paradigm. In other cases, the pronoun’s role is played by a specific system of person-marked adverbs (Kiefer 2000; Korchmáros...
2009). Table 7 shows the nominal and accusative forms, as well as examples of other syntactic functions used through person-marked adverbs.

**Table 7:** Personal pronouns and person-marked adverbs in various cases

<table>
<thead>
<tr>
<th>Case</th>
<th>1Sg</th>
<th>2Sg</th>
<th>3Sg</th>
<th>1Pl</th>
<th>2Pl</th>
<th>3Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominative</td>
<td>én</td>
<td>te</td>
<td>ô</td>
<td>mi</td>
<td>ti</td>
<td>ôk</td>
</tr>
<tr>
<td>Accusative</td>
<td>engem</td>
<td>tégéd</td>
<td>ôt</td>
<td>minket</td>
<td>titeket</td>
<td>ôket</td>
</tr>
<tr>
<td>Dative</td>
<td>nekem</td>
<td>neked</td>
<td>neki</td>
<td>nekünk</td>
<td>nektek</td>
<td>nekik</td>
</tr>
<tr>
<td>Instrumental</td>
<td>velem</td>
<td>veled</td>
<td>vele</td>
<td>velünk</td>
<td>veletek</td>
<td>velük</td>
</tr>
<tr>
<td>Inessive</td>
<td>bennem</td>
<td>benned</td>
<td>benne</td>
<td>bennünk</td>
<td>bennetek</td>
<td>bennük</td>
</tr>
<tr>
<td>Illative</td>
<td>belém</td>
<td>beléd</td>
<td>belé</td>
<td>belénk</td>
<td>belétek</td>
<td>beléjük</td>
</tr>
<tr>
<td>Allative</td>
<td>hozzám</td>
<td>hozzád</td>
<td>hozzá</td>
<td>hozzánk</td>
<td>hozzátok</td>
<td>hozzájuk</td>
</tr>
</tbody>
</table>

The base of these adverbs preceding the Person-Number marker is either made up of case inflections themselves or postpositional forms, which can be found on nouns. Case inflections include, for example, vel “with”, ben “in”, nál “at” or től “from”. Synchronically used postpositions include, for example, alatt “under” or után “after”. 12 exemplifies the fact that these stems can be seen in the usual position of inflections and postpositions: attached or coming after nouns:

(12) Ildivel – velem a ház    alatt – alattunk
‘with Ildi – with me’ ‘under the house – under us’

All of them adopt the basic synthetic feature of Hungarian: while they express the syntactical relationship, they also behave like new paradigmatic stems to which inflectional markers can be attached (Korchmáros 2009:125). These person-marked adverb inflections follow a distinct paradigm: -Vm, -Vd, -a/-e, unk/-ünk, VtVk, uk/ük (cp. Kiefer 2000:220). Note that the system of person-marked adverbs does not exhibit the full set of case inflections and postpositions. A number of these forms cannot be combined with Person-Number markers.

In addition to the person-marked adverbs in pronominal function, there are some other pronouns that can also show
inflections for Person and/or Number. Some of them can take the general plural -k like relative, interrogative and demonstrative pronouns: *ami – amik* “which”, *ki – kik* “who”, *az – azok* “that” – “those”.

The reciprocal pronoun *egymás* “each other” can take the possessive marker –é, followed by the plural marker –i, resulting in the word form *egymáséi* “each other’s” (Korchmáros 2009:129). The general universal pronoun *minden* and its negation, *semmi*, shows the personal possessive marker inflected for Person and Number, as discussed with nouns (ibid. 2009:134).

Finally, reflexive pronouns have to be mentioned here. At first sight, they show already known Person-Number markers (Table 3.5).

**Table 8: The paradigm of Hungarian reflexive pronouns**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1Sg</td>
<td>magam</td>
</tr>
<tr>
<td>2Sg</td>
<td>magad</td>
</tr>
<tr>
<td>3Sg</td>
<td>maga</td>
</tr>
<tr>
<td>1Pl</td>
<td>magunk</td>
</tr>
<tr>
<td>2Pl</td>
<td>magatok</td>
</tr>
<tr>
<td>3Pl</td>
<td>maguk</td>
</tr>
</tbody>
</table>

However, synchronically, they can no longer be segmented as separate markers of bound morphemes; rather, they have become frozen forms and they follow nouns in syntactic behaviour (Korchmáros 2009:127). In contrast to personal pronouns, they can show up in various syntactic functions: as subject, object, possessive premodifier or adverbs. In an adverbial function, they exhibit case markers. Sometimes, they also take the possessive plural marker -i (ibid. 2009:128).

This section provided a brief overview of the main patterns of Person and Number marking in Hungarian. As showed, there are similar forms across paradigms with a great number of phonological alternations. This summary dispensed with most of the irregularities and did not deal with phonological and syntactical rules that influence
morphological forms. These can be found in every reference grammar of Hungarian.

To sum up the issue of Person-Number markers, the overall mechanism underlying formal accordance is due to morphological agreement, which explicitly shows syntactical agreement on the surface.

**Case in Hungarian**

Case is a category which distinguishes between the relations that a noun phrase may bear to a governing head. It is a canonical example of context-dependent inflection in Hungarian.

Besides Person and Number, the Case feature demonstrates another highly productive inflectional paradigm in Hungarian. Kiefer (2000) distinguishes between 18 Case values that can be marked on nouns, various pronouns and person-marked adverbs. There are three values that can usually be inferred from the syntactical context (nominative as the subject, accusative as the direct and dative as the indirect object), but further values can be stored in the lexicon as obligatory to a verb’s arguments (Kiefer 2000:579). Hungarian is rich in locative and directive Case markers. Word forms with Case inflection can be derived through inflectional rules.

As mentioned, there are a high number of Case markers (18). The inflectional affixes always follow vocal harmony rules which results in various phonological realizations. As the whole Case marking paradigm is not relevant to the empirical analysis, I rather draw the attention to some word forms that appear frequently in the data.

The rules for accusative and dative marking are as follows: 
\[ N + \text{affix, accusative} \rightarrow N+t, \ N + \text{affix, dative} \rightarrow N+-nak/nek \]

Example 13 is a portrayal of Case marking in action. The direct and the indirect object of the sentence are expressed through Case inflection:

(13) Péter könyvet adott Annának  
‘Péter gave a book to Anna’

The rules for Inessive and Instrumental are as follows: 
\[ N + \text{affix, inessive} \rightarrow N+-ban/ben, \ N + \text{affix, instrumental} \rightarrow N+-vel/vel \]
Example 14 includes both Insessive and Instrumental:

(14) Mozi\textit{ban} voltam a fiú\textit{val}  
\textit{I was at the cinema with the boy} 

The rules for Illative and Allative are as follows: \([N+ \text{ affix}, \text{illative}] \rightarrow N+-ba/be, [N+ \text{ affix}, \text{allative}] \rightarrow N+-hoz/hez/höz}  

Example 15 includes both Illative and Allative:

(15) Rakd be a kenyeret a sűtő\textit{be} és menj át a szomszéd\textit{hoz}  
\textit{'Put the bread in the oven and go to the neighbour'}  

The following table serves as an overview to show the phonologically distinct realisations of the inflections discussed.

\textbf{Table 9: Frequent Case marker on different nouns}  

<table>
<thead>
<tr>
<th>Case</th>
<th>fiú</th>
<th>ebéd</th>
<th>könyv</th>
<th>mérnök</th>
<th>szamár</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominative</td>
<td>'boy'</td>
<td>'lunch'</td>
<td>'book'</td>
<td>'engineer'</td>
<td>'donkey'</td>
</tr>
<tr>
<td>Accusative</td>
<td>fiút</td>
<td>ebédet</td>
<td>könyvet</td>
<td>mérnőköt</td>
<td>szamarat</td>
</tr>
<tr>
<td>Dative</td>
<td>fiúnak</td>
<td>ebédnak</td>
<td>könyvnek</td>
<td>mérnőknek</td>
<td>szamárnak</td>
</tr>
<tr>
<td>Inessive</td>
<td>fiúban</td>
<td>ebédben</td>
<td>könyvben</td>
<td>mérnőkbén</td>
<td>szamárban</td>
</tr>
<tr>
<td>Instrumental</td>
<td>fiúval</td>
<td>ebéddel</td>
<td>könyvvel</td>
<td>mérnőkkkel</td>
<td>szamárral</td>
</tr>
<tr>
<td>Allative</td>
<td>fiúhoz</td>
<td>ebédehez</td>
<td>könyvhoz</td>
<td>mérnőkhöz</td>
<td>szamárhoz</td>
</tr>
</tbody>
</table>

\textbf{2.3 Research questions}  

In a preliminary study Racz (2010) showed cases for Hungarian native signers making use of spoken inflections in mouthings. Racz-Engelhardt (2016) elaborated on this issue by investigating 697 mouthings with inflections. The in-depth data analysis of six informants showed that the main spoken Hungarian inflectional categories indicated through mouthings were Person and Number on verbs and nouns; other relevant categories were Case and nominal Number.

These were the first empirical findings on MJNY that
systematically showed how the spoken inflectional morphology can be integrated in signed utterances through mouthings.

The next logical step toward a better understanding of the signed–spoken contact situation resulted in the main research question of the present study:

**What do the hands do while the mouth marks inflection?**

Bank et al. (2013) assume it would provide more evidence for the bilingual activation of NGT and Dutch if alignment of spoken inflections with morphological properties of NGT were investigated further (2011: 264). Boyes Bream (2001) also suggest this type of morphological combination of sign and spoken language to be worthy of detailed analysis in DSGS. She suggests the investigation of conflict sites (the same functions in two languages with respectively different markings) (2001:124).

Along similar lines, I hypothesized that signers choose to express inflectional meaning (e.g. Person or Number marking) by various, temporally synchronized combinations of manual signs and spoken Hungarian inflections, latter indicated through the nonmanual component *mouthing*. Grammatical information comes from two source languages of different modalities: visual-gestural and auditory-vocal.

This unique situation is possible because (1) certain paradigms of spoken Hungarian are part of the bilingual repertoire of signer and (2) both source languages exhibit inflection. As we know from studies on bilingual bilingualism (Emmorey et al 2008) as well as from sign language corpus work (Bank et al. 2011), signs and the accompanying mouthings are usually semantically congruent. Mouthings, as they spread over signs, also play a role in indicating prosodic clusters of signs (cp. Crasborn et al 2008). My contribution to the study of sign language mouthings is the novel question, whether synchronization can be attested even on the morphological level. That is, for example, Person and Number marking in signs and mouthings show congruent grammatical values.

Based on these initial ideas, specific research questions have been formulated as follows:
1. What kind of analogue manual expressions correspond to the Hungarian inflectional meaning in the mouthing?
   - Does MJNY utilize its inflectional morphology for this aim?
   - If no equivalent category is available (like Case), through which means do signers reflect the inflectional marker?
2. Do the manual articulators express grammatical meaning which is congruent with the meaning indicated in mouthings (e.g. certain values of Person, Number or Case morphemes)?

3 Methodology

3.1 Data collection

This paper is based on a small corpus created at the University of Hamburg between 2012 and 2015. An MJNY video collection of interviews with Hungarian Deaf signers (110 minutes of raw material) served as the source of the empirical data. Transcription was carried out with the annotation tool iLex (Hanke & Storz 2010). Mouthing forms were annotated using Hungarian orthography.

The choice of the language material was highly important for the corpus. In the bilingual Deaf community MJNY co-exists with spoken Hungarian. This situation results in various ways of mixing the two languages. My intention was to collect data from sign language discourses with possibly less spoken language influence. It seemed to be the only way to find evidence for the interaction of Hungarian and MJNY on a grammatical level that cannot be adhered to the phenomenon of contact. This attempt, of course, does not intend to treat MJNY as independent linguistic system in a social vacuum without any influence from Hungarian. The goal was rather to base this research on linguistic data that come from a type of sign language use that can be labelled as typical MJNY among Deaf signers, even if it is not possible at this point to define the degree to which Hungarian features are acceptable in this linguistic system.

Also, mouthing use is known to be a very subtle, dynamic phenomenon which seems to react sensitively to changes in language activation, that is: More spoken language dominance leads to more spoken-language-like mouthings (cp. Lucas & Valli 1992). It makes
difficult to study mouthings with any intuition-based linguistic approach. At the present time there is no clear evidence for usual or acceptable mouthing patterns in grammatical MJNY utterances.

The sign language videos in question were recorded in a project by the Foundation for Equal Opportunities of Persons with Disabilities in Hungary. The project aimed at establishing teaching materials on the subject of Deaf culture for training of Deaf school teachers.

This collection contains of sessions with 30 Deaf individuals with a length of 12 to 77 minutes that were recorded by Deaf sign language users in different regions of Hungary. The interviewers working in this project were prominent personalities of the Deaf community involved in language teaching, research as well as politics. The interview sessions took place at the signers’ home or at the local Deaf club. A high degree of familiarity was often present, the interviewers and the interviewees had often known each other for a long time. Participants were all asked the same questions; however, the sessions were constructed loosely in the sense that between short questions participants narrated freely. The interviewees talked about their personal lives involving family, school and work.

The text type or discourse mode can thus be defined as narrative (Smith 2003). The participants (both male and female) varied in age, education and linguistic background as it comes out of their self-report on some of these issues in the recordings.

Although the recording situation cannot avoid some degree of formality, members of the project stated that the situations were constructed to be as calm and natural as possible. These language production samples were definitely free of the observer’s paradox in the sense that it was independent of any intention of judgment for a linguistic analysis.

From this large set of recordings featuring numerous Deaf informants, 3 male and 3 female persons were chosen for the corpus. As

2 The data collection was part of the Deaf Community and Culture teaching material and was financed by the TAMOP Social Renewal Operational Program 5.4.5, carried out in the frame of the working group Deaf Community and Deaf Individual. For further information about the Foundation see: http://fszk.hu/english-introduction/
they reported, 5 of 6 came from Deaf families and acquired MJNY from birth (early L1 signers). One person was exposed to MJNY from the time he went to kindergarten (approx. 3 years old), thus can be labelled as late L1 signer. As Boudreault and Mayberry (2006) suggested, signers who were exposed to a sign language by this age show high sign language proficiency. Although the late L1 signer was on the border of this stage, given the fact that he is known in the community as an acclaimed signer and former teacher of MJNY, there was no reason to assume that a high MJNY competency would not be provided in his case.

All the participants have been engaged in the Deaf community since early childhood through family, education, Deaf club activities etc. Given the background of the participants, it can be strongly assumed that they owned L1 linguistic intuition and can be regarded as competent signers. Moreover, three of them were involved in sign language teaching and one of them was a part-time teacher in a Deaf school.

To sum up, the videos contained language production about which participants intuitively believed to be acceptable in MJNY. Based on the literature one would assume much fewer mouthings with inflections compared to other settings like formal presentation in front of mixed (hearing and Deaf) audience or signing a written Hungarian texts.

I took this limitation into account. Finding probably fewer mouthings in texts that can be seen as good examples of MJNY leaves me with more confidence in respect to authentic mouthing patterns and the grammaticality of MJNY utterances. At the same time I was aware that further comparative investigations of more strictly controlled sociolinguistic factors will certainly reveal more of the subtle changes mouthings might show in different settings and text-types.

3.2 Annotation

In this research a problem-oriented annotation or bottom-up approach was followed in that only those parts of the video recordings were annotated which were identified as containing mouthing with
Hungarian inflections. The following table gives an overview of the lengths of video data and the annotated subset of these videos.

**Table 10: Lengths of raw video data and the annotated corpus parts**

<table>
<thead>
<tr>
<th>Informants</th>
<th>Length of video data in the corpus</th>
<th>Number of annotated clips (utterances)</th>
<th>Length of annotated clips</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>19:08 min</td>
<td>41</td>
<td>03:05 min</td>
</tr>
<tr>
<td>S2</td>
<td>19:46 min</td>
<td>155</td>
<td>09:52 min</td>
</tr>
<tr>
<td>S3</td>
<td>21:23 min</td>
<td>54</td>
<td>03:15 min</td>
</tr>
<tr>
<td>S4</td>
<td>14:04 min</td>
<td>16</td>
<td>00:59 min</td>
</tr>
<tr>
<td>S5</td>
<td>20:45 min</td>
<td>31</td>
<td>01:49 min</td>
</tr>
<tr>
<td>S6</td>
<td>14:20 min</td>
<td>42</td>
<td>02:26 min</td>
</tr>
<tr>
<td>Sum</td>
<td>109:26 min</td>
<td>339</td>
<td>21:26 min</td>
</tr>
</tbody>
</table>

These almost 110 minutes video data were used for annotation purposes. The first step was the selection of discourse chunks where mouthings with Hungarian inflections were identified. I segmented the discourse chunks around these mouthings based on intonational phrase boundaries. It resulted in 339 utterances (IPs) that had an overall length of 21:26 minutes. The number of IPs was signer-dependent. As there was no intention in this research to compare signers e.g. upon psycho- or sociolinguistic variables, the uneven amount of data was not considered to be relevant. However, it was already seen at this stage that Signer 2 produced considerably more utterances with mouthings with Hungarian inflections (155), thus her part made up nearly 10 minutes in contrast to other signers with approx. 1 to 3 minutes material to annotate.
The IP segmentation was followed by the full annotation of these chunks for manual MJNY signs and all the mouthings with Hungarian inflections. It was desirable to find out how frequent these mouthing occurrences actually are in my annotated corpus to get an idea about the relevance of the phenomenon under investigation. Sutton-Spence & Day (2001) showed that BSL signers use significantly less mouthings in narrative texts than in information-giving registers. Also, the study of Nadolske & Rosenstock (2007) on ASL mouthings indicated that mouthings are more dominant in formal registers like lecturing than in storytelling and conversation. In the beginning of a conversation, mouthings can still take up an amount close to formal presentation; but as soon as informants make their connection to the conversational partner and adapt to his/her more informal style, mouthings occur considerably less (Nadolske & Rosenstock 2007). In the light of these findings the video material was estimated to have relatively few mouthings with Hungarian inflections. It is suggested by the more informal sessions, the familiarity between informants and interviewers and the storytelling parts that dominated the discourse.
The full annotation of mouthings was carried out by two independent signers who worked through all the 339 clips. They had access to the raw videos, tagged every mouthing with or without inflection separately from iLex and provided me with the results. In some clips, no mouthings with spoken inflections were found.

After a strict verification process discussed in Racz-Engelhardt (2016), the subset of mouthings with inflectional suffixes was listed and finally tagged in iLex. The following table shows the number of signs, mouthings and the subset of mouthings with inflections.

<table>
<thead>
<tr>
<th>Number of sign tokens</th>
<th>Full number of mouthings</th>
<th>Number of mouthings with Hungarian inflections in the final corpus</th>
</tr>
</thead>
<tbody>
<tr>
<td>2922</td>
<td>2114</td>
<td>697</td>
</tr>
</tbody>
</table>

Overall, 2922 signs were glossed. The full number of produced mouthings adds up to 2114. The data show that 72% of the signs are accompanied by mouthings in these utterances. Mouthings in general seem to be omnipresent in these signed utterances. This result resembles the NGT findings by Bank et al. (2011) and the Auslan data in Johnston et al. (2015).

Eventually, the final annotated corpus contained 697 mouthings with Hungarian inflections. It means that 33% of the produced mouthings in these utterances were found to be inflected in terms of Hungarian. This ratio suggests that at least in the annotated part of the corpus spoken inflection can by no means considered to be an exceptional phenomenon and its relation to the signed utterance definitely deserves further investigation.

An issue that I want to highlight is the dispersion of elements or constructions over the corpus. Gries (2008) discusses that reporting the relative frequencies of linguistic elements (e.g. a mouthing occurs in 33% of the data set), especially if it is a more unbalanced corpus, is in fact nothing more than giving an overall mean which does not reflects the parts of that corpus. Statements or further statistics derived from such overall relative frequencies are suspicious since it is easily possible that certain findings are entirely under-representative for the corpus as a whole. For instance, Stefanowitsch and Gries (2003)
examined the imperative of the British part of the International Corpus of English (ICE-GB) and found that some verbs like fold or process are among the highly-ranked items. However, they all came from a single file (ibid 2003), hence, these high frequencies are not representative for the whole corpus.

In a small-scale corpus study as the present one, such problems based on uneven distributions can undermine later analytical steps even more extremely. Therefore, I decided to give the absolute observed frequencies as raw indices for the appearance of an item together with a measure for the degree of dispersion. It reveals to which extent the corpus frequency of a mouthing or a mouthing–sign collocation mirrors the overall distribution of that item in the corpus.

For this reason I adopted the Dispersion of Proportions (DP) measure proposed by Gries (2008). It is a conceptually simple measure that assigns a value between 0 and 1 to an item. The more the value approaches zero, the better the item’s relative frequencies are proportional to the sizes of the corpus divisions, meaning the better the item is distributed evenly in the data set. DP is a parts-based measure which has some considerable advantages for the study. As Gries (2008) summarizes, (1) it can also be applied on differently sized corpus parts, (2) it utilizes a simple principle: differences between observed percentages and percentages of the corpus parts. Moreover, (3) it handles occurrences and co-occurrences of elements and (4) sensitive for minor differences thus bears enough discriminatory power. A simple ranking of items based on DP value shows the relation of representativeness between their observed frequencies in the corpus (2008:425). The use of the DP will be demonstrated in a few tables of the next section.

4 Findings

4.1. Overall corpus data. Frequency and distribution measures

The quantitative part of the findings was centered on frequencies of occurrences and co-occurrences as usual in corpus-based studies.
However, the analysis had to take the heterogeneous feature of the corpus into consideration. Especially Signer 2 produced much more mouthings with inflections then the others, thus, the full annotated part of her utterances made up 9:52 minutes compared to the 1 to 3 minutes of other signers. S2 produced 441 mouthings, that is, 63 % of the overall instances. The other 5 signers are more homogenous in this respect. The number of occurrences falls between 18 and 81.

Table 12: Frequencies of mouthings with inflection produced by 6 informants

<table>
<thead>
<tr>
<th>Informants (corpus parts)</th>
<th>Frequencies of mouthings with inflection</th>
<th>Number of minutes analyzed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signer 1</td>
<td>63 (9 %)</td>
<td>03:05 min</td>
</tr>
<tr>
<td>Signer 2</td>
<td>441 (63 %)</td>
<td>09:52 min</td>
</tr>
<tr>
<td>Signer 3</td>
<td>81 (12 %)</td>
<td>03:15 min</td>
</tr>
<tr>
<td>Signer 4</td>
<td>18 (3 %)</td>
<td>00:59 min</td>
</tr>
<tr>
<td>Signer 5</td>
<td>36 (5 %)</td>
<td>01:49 min</td>
</tr>
<tr>
<td>Signer 6</td>
<td>58 (8 %)</td>
<td>02:26 min</td>
</tr>
</tbody>
</table>

The final mouthing data set of 697 items was taken for investigation for inflectional markers and sign co-occurrences. The three main groups under study are shown in the table below. Further details of the different word forms found in the corpus can be found in Racz-Engelhardt (2016). This paper will now focus only on inflectional meaning in the mouthings in relation to manual signs.

Table 13: Three main types of inflectional markers.

<table>
<thead>
<tr>
<th>Inflectional markers</th>
<th>Mouthings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person-Number markers</td>
<td>N = 475</td>
</tr>
<tr>
<td>Case markers</td>
<td>N = 227</td>
</tr>
<tr>
<td>Nominal Number markers (plurality)</td>
<td>N = 41</td>
</tr>
</tbody>
</table>

3 The number of all inflectional markers exceeds the number of mouthings (697) because there are mouthings which show both Person–Number and Case at the same time.
4.2 Mouthing–sign co-occurrences

As the first investigation in Racz-Engelhardt (2016) showed, signers do make use of spoken inflectional markers in their mouthings in the studied corpus. These markers, especially the three outlined above are usually not bounded to specific mouthings, but come along with various instances. In sum, the data indicate that singers have access to and can command inflectional paradigms of Hungarian, even if they don’t use the full paradigms but prefer certain forms e.g. 1 or 3 Person.

Based on these results, the central question of the present study was this: What do the hands do while the mouth marks inflection?

I was interested whether one can see strategies of signers to express inflectional meaning by simultaneous combinations of signs and mouthings in their natural utterances.

Although sign languages do have inflectional characteristics, they have many other possibilities to convey the same meaning which Hungarian indicates by inflection. The first specific question under study is therefore: What kind of analogue manual expressions correspond to the Hungarian inflectional meaning in the mouthing?

In addition, keep in mind that the morphological and even linguistic status for many different signs, e.g. pointing signs or other non-first person indicating verbs is under debate (cp. Rathmann & Mathur 2011). Thus, it is not always obvious what can count as corresponding morphologically meaningful manual signs.

The second specific research question was: Do the manual articulators express grammatical meaning which is congruent with the meaning indicated in mouthings (e.g. certain values of Person, Number or Case morphemes)?

We know from the literature that signs and mouthings are produced simultaneously and are semantically and temporally coordinated in their appearance (cp. Emmorey et al 2008; Crasborn et al. 2008; Bank et al. 2011, 2013). The new question is now: is there any synchronization or combination of grammatical information as well?

The idea of the so called spreading of mouthings over signs which, is described in Crasborn at al. (2008) and Bank et al. (2013)
How mouthings interplay with sign morphology

seemed to be a good way to categorize the data. That is, in the identification and categorization of temporal alignment of inflected mouthings forms with signs, I assumed that manual signs which are reflective of the meaning of the Hungarian inflectional markers, fall into the same time frame, that is, produced simultaneously. The next table shows the overall spreading patterns in the corpus.

**Table 14:** Mouthing with Person, Number or Case markers spreading over manual signs (N= 697)

<table>
<thead>
<tr>
<th>Number of signs produced during mouthing</th>
<th>Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 sign</td>
<td>340</td>
</tr>
<tr>
<td>2 signs</td>
<td>295</td>
</tr>
<tr>
<td>3 signs</td>
<td>54</td>
</tr>
<tr>
<td>4 signs</td>
<td>8</td>
</tr>
</tbody>
</table>

As we can see, widely the most common is for signers to produce 1 or 2 signs during these inflected mouthing sequences. This is similar to findings in the NGT corpus as reported by Bank et al. (2013). 3 to 4 signs are rather rare and usually involve repetitions or gestures.

In the following sections a detailed descriptive analysis of the findings is given providing a wide range of examples for the different sign sequences co-occurring with mouthings in the MJNY corpus.

**4.2.1. Research question 1: Patterns of manual co-occurrence**

The first group concerns mouthings with Person–Number markers. These are two abstract categories produced together in one overt morph in spoken Hungarian (Kiefer 2000). 475 occurrences were found for this group that makes up 68% of the 697 mouthings. It suggests that Person–Number is a fairly frequent inflectional marker in the corpus. The table below shows the absolute frequencies of each corpus part and the normalized relative frequencies compared to the signers’ overall mouthings.
Table 15: Absolute and relative frequencies for Person–Number marker

<table>
<thead>
<tr>
<th>Informants</th>
<th>Mouthings</th>
<th>Colligation (Person–Number marking)</th>
<th>Rel. freq. ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>63</td>
<td>53</td>
<td>84%</td>
</tr>
<tr>
<td>S2</td>
<td>441</td>
<td>288</td>
<td>65%</td>
</tr>
<tr>
<td>S3</td>
<td>81</td>
<td>60</td>
<td>74%</td>
</tr>
<tr>
<td>S4</td>
<td>18</td>
<td>14</td>
<td>78%</td>
</tr>
<tr>
<td>S5</td>
<td>36</td>
<td>21</td>
<td>58%</td>
</tr>
<tr>
<td>S6</td>
<td>58</td>
<td>39</td>
<td>67%</td>
</tr>
<tr>
<td>Sum</td>
<td>697</td>
<td>475</td>
<td>68%</td>
</tr>
</tbody>
</table>

The frequencies of this colligation range between 58% (S5) and 84% (S1). It can be said that a large part of each signer’s mouthing is occupied by this inflectional marker, especially in S1, S3 and S4. It also applies for S2, although her 65% and S5’s 58% suggest that they produce somewhat more mouthing with other markers. In sum, the overall frequency of 68% is well-reflected among the informants. The co-occurrence shows high frequency and a rather even distribution, thus can be regarded as strong colligation in the corpus.

Let us look now at signs which co-occur with these mouthing. First, mouthed verbs are shown which indicate inflection, followed by nouns and adverbs with a Person–Number markers.

The next table shows frequency and the value of dispersion (DP) in the more frequent types of manual word class which co-occur with verbal Person–Number markers. The order of these types is based on the DP value.
Table 16: Frequent signs co-occurring with inflected verbs in mouthing (N=352)

<table>
<thead>
<tr>
<th>Sign word class</th>
<th>Freq</th>
<th>DP</th>
<th>Sign word class</th>
<th>Freq</th>
<th>DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verb+Gesture</td>
<td>43</td>
<td>0,146</td>
<td>Verb+Pointing+Gesture</td>
<td>15</td>
<td>0,358</td>
</tr>
<tr>
<td>Verb+Pointing</td>
<td>67</td>
<td>0,151</td>
<td>Verb+AUX</td>
<td>2</td>
<td>0,366</td>
</tr>
<tr>
<td>Verb</td>
<td>154</td>
<td>0,297</td>
<td>Verb+Pointing+Pointing</td>
<td>4</td>
<td>0,463</td>
</tr>
<tr>
<td>Verb+Verb</td>
<td>5</td>
<td>0,344</td>
<td>Cl verb</td>
<td>11</td>
<td>0,478</td>
</tr>
<tr>
<td>Verb+Other</td>
<td>4</td>
<td>0,344</td>
<td>Gesture</td>
<td>4</td>
<td>0,478</td>
</tr>
<tr>
<td>Pointing</td>
<td>11</td>
<td>0,344</td>
<td>Pointing+Gesture</td>
<td>5</td>
<td>0,478</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Verb+Cl noun</td>
<td>6</td>
<td>0,782</td>
</tr>
</tbody>
</table>

Most of the occurrences involve at least a signed verb which is obviously expected. Among the most frequent and best dispersed elements we can see single manual verbs. In these cases, mouthings do not spread. We can also see the combination of verbs with pointing signs or a gestures (mouthings spread over two signs). Verbs with pointing sign or gesture come from all signers; single manual verbs were produced by 5 of the six informants. Cases involving a single manual verb may occur widely the most, however, their proportional dispersion is less; it indicates that these co-occurrences must be produced by 1-2 signers and/or in an unexpected amount. In fact, S2 produces 126, somewhat above the expected, S1 produces 7, more than expected and S4 does not produce it at all. This situation can be attested with the less DP value.

All other occurrences than the aforementioned three are much less frequent and more unevenly dispersed.

The Person-Number markings which appear on noun mouthings (N=94) indicate the possessor of a possessive relationship: for example, *apám* “my father”, *szomszédunk* “our neighbour” etc. Similar to the findings for verbs, if an inflection is produced in mouthings, it comes always along with manual activity. Among the 94 mouthings marking possessor I found 23 different manual configurations which co-occurred with the oral activity. As it was observed in different subset of the data corpus, about the half of these configurations are
one-time occurrences. Those which occurred repeatedly are displayed here.

Table 17: Signs co-occurring with noun mouthing inflected for Person–Number (N=94)

<table>
<thead>
<tr>
<th>Sign word class</th>
<th>Freq</th>
<th>DP</th>
<th>Sign word class</th>
<th>Freq</th>
<th>DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noun+Gesture</td>
<td>4</td>
<td>0.284</td>
<td>Noun+Pointing+Pointing</td>
<td>4</td>
<td>0.832</td>
</tr>
<tr>
<td>Noun</td>
<td>23</td>
<td>0.340</td>
<td>Verb</td>
<td>2</td>
<td>0.865</td>
</tr>
<tr>
<td>Verb+Pointing</td>
<td>4</td>
<td>0.367</td>
<td>Noun+Verb</td>
<td>2</td>
<td>0.884</td>
</tr>
<tr>
<td>Noun+Pointing</td>
<td>35</td>
<td>0.461</td>
<td>Noun+Pointing+Verb</td>
<td>2</td>
<td>0.910</td>
</tr>
<tr>
<td>Noun+CLSAS</td>
<td>3</td>
<td>0.577</td>
<td>Noun+Verb+Other</td>
<td>2</td>
<td>0.974</td>
</tr>
</tbody>
</table>

As one can see, there is only two co-occurrence types with higher frequency, Noun (N=23), produced by 4 signers, and Noun+Pointing (N=35), produced by 5 signers. These two cases have more pervasive presence in the data. All other manual signs or sign combinations have only 2 to 4 instances. In terms of proportional dispersion, most of the examples in the table rank between middle and low values. It means that these manual co-occurrences do not follow exactly the proportions of the different signer’s overall data.

The manual structures in the noun subset shows more individual differences.

The last, comparably small group contains those mouthings which refer to Hungarian adverbs with Person–Number marking: so-called person-marked adverbs (N=28). These word in Hungarian have a case morpheme or postposition as stems and marked for Person and Number, expressing different directional, locational and relational attributes. There are only 6 different case or postposition stems to which Person–Number markers are added. Half of the adverbs (14) have the stem ‘nek’ “to” and form 4 different combinations: 8 ‘nekem’ “to me”, 4 ‘neki’ “to him/her/it”, 1 ‘neked’ “to you” and 1 ‘nekip’ “to them”. The second most frequent stem is ‘vel’ “with” appearing in ‘veli’ “with him/her/it” and 1 “veltem” “with me”. The third is ‘hoz’ “to” as 3 ‘hozzám’ “to me” and 1 ‘hozzánk’ “to us”.

The following paragraphs discuss these adverbs in more detail.

As for the noun subset, the manual co-occurrences have a more individual distribution. The manual structures in this subset shows more specific differences.
Given the small number of the group, the overview table shows all the manual co-occurrences that were found for these mouthings.

Table 18: Signs co-occurring with person-marked adverbs inflected for Person–Number (N=94)

<table>
<thead>
<tr>
<th>Sign word class</th>
<th>Freq</th>
<th>DP</th>
<th>Sign word class</th>
<th>Freq</th>
<th>DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUX</td>
<td>11</td>
<td>0.213</td>
<td>Pointing+_AUX</td>
<td>1</td>
<td>0.903</td>
</tr>
<tr>
<td>Pointing</td>
<td>9</td>
<td>0.296</td>
<td>Verb</td>
<td>1</td>
<td>0.296</td>
</tr>
<tr>
<td>AUX+Gesture</td>
<td>2</td>
<td>0.730</td>
<td>CLnoun+_AUX</td>
<td>1</td>
<td>0.846</td>
</tr>
<tr>
<td>Verb+Pointing</td>
<td>2</td>
<td>0.296</td>
<td>Gesture+Other</td>
<td>1</td>
<td>0.296</td>
</tr>
</tbody>
</table>

It is important to note that this group involves only 4 out of the 6 signers, S1 and S5 did not make use of Hungarian person-marked adverbs in mouthing. Moreover, most of the collocations come from S2, she produces 5 of the 8 manual co-occurrence categories shown in the table. S6 produces 3 collocation categories (5 instances all) while the other two signers contribute only 1 instance each.

As the table shows there are two manual co-occurrences, an auxiliary sign and the pointing sign which were produced most frequently (11 and 10 out of 28 respectively). However, the pointing was only used by S2. The other possibilities with 1-2 occurrences can be considered as exceptions.

If we look at the groups of co-occurrences above, we can see that there are in each one a few patterns which are produced predominantly and characterize the corpus. Beyond that, we see individual variations.

One of the patterns we see that mouthings with Person–Number markers appear time-aligned with single signs of analogue word class (noun or verb respectively). In further usual combinations these signs which are manual counterparts of the mouthings come together with additional pointing or gesture signs or various combinations of these. The person-marked adverbs usually appear with auxiliary signs or pointing.

If some kind of manual correspondence beyond the given time frame of the mouthings were found, these showed similar
patterns. It happens occasionally when the oral and manual channel are not aligned, but, in essence, we see the same phenomenon.

The data presented so far gave a short descriptive overview of types of manual signs which co-occur with mouthings inflected for Person and Number.

The other large group of mouthings under investigation appears with Case marker at the end of the word form. I found 227 such mouthings, that is 29.5% of the 697 occurrences. The table gives an overview of the colligation in signers.

Table 19: Absolute and relative frequencies for Case marker

<table>
<thead>
<tr>
<th>Informants</th>
<th>Mouthings</th>
<th>Colligation (Case marking)</th>
<th>Rel. freq. ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>63</td>
<td>10</td>
<td>16%</td>
</tr>
<tr>
<td>S2</td>
<td>441</td>
<td>156</td>
<td>35%</td>
</tr>
<tr>
<td>S3</td>
<td>81</td>
<td>22</td>
<td>27%</td>
</tr>
<tr>
<td>S4</td>
<td>18</td>
<td>6</td>
<td>33%</td>
</tr>
<tr>
<td>S5</td>
<td>36</td>
<td>9</td>
<td>25%</td>
</tr>
<tr>
<td>S6</td>
<td>58</td>
<td>24</td>
<td>41%</td>
</tr>
<tr>
<td>Sum</td>
<td>697</td>
<td>227</td>
<td>29.5%</td>
</tr>
</tbody>
</table>

Each signer produces Case markers in 16% to 41% of their mouthings, the mean being 29.5%. One can see that all signers make use of the marker and don’t exhibit extreme differences. It is also true for S2. Although the most examples (156) come from her data, which reminds us of her preference for mouthings, the proportion of Case among her mouthings is similar to the other informants. In sum, Case marker is much less present than the Person-Number marker (68% overall) but there is still a subset of about one third of the occurrences which is an amount that deserves closer examination.

In terms of co-occurrences, we can say, manual activity accompanies these mouthings, too. Overall, 226 manual–oral collocations can be identified. There is one single occurrence, the mouthing ‘amit’ “which” with an accusative suffix that is not accompanied by manual activity.
44 different manual signs and sign combinations were identified, most of them one time occurrences as observed in other data subsets as well. In this subset most of the co-occurrences involve a noun in the mouthing, which is the most frequent word class for case in Hungarian. There are also other word classes appearing in the corpus with case in a marginal amount, hence, these are not dealt with in this paper.

The following table offers an overview about the frequent manual co-occurrences (re-occurred 3 or more times) ranked by their proportional dispersion.

**Table 20**: Signs co-occurring with noun mouthing inflected for Case (N=226)

<table>
<thead>
<tr>
<th>Sign word class</th>
<th>Freq</th>
<th>DP</th>
<th>Sign word class</th>
<th>Freq</th>
<th>DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noun+signed Hun</td>
<td>37</td>
<td>0,122</td>
<td>Pointing</td>
<td>19</td>
<td>0,314</td>
</tr>
<tr>
<td>Noun+Pointing</td>
<td>15</td>
<td>0,173</td>
<td>Noun+Verb</td>
<td>11</td>
<td>0,320</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>0,244</td>
<td>Noun+CLverb</td>
<td>5</td>
<td>0,367</td>
</tr>
<tr>
<td>Other+Gesture</td>
<td>3</td>
<td>0,251</td>
<td>Noun+Gesture</td>
<td>6</td>
<td>0,367</td>
</tr>
<tr>
<td>Verb</td>
<td>20</td>
<td>0,251</td>
<td>Pointing+signed Hun</td>
<td>3</td>
<td>0,367</td>
</tr>
<tr>
<td>Noun</td>
<td>37</td>
<td>0,259</td>
<td>Other+signed Hun</td>
<td>7</td>
<td>0,689</td>
</tr>
<tr>
<td>signed Hun</td>
<td>3</td>
<td>0,277</td>
<td>Noun+Verb+Pointing</td>
<td>4</td>
<td>0,698</td>
</tr>
<tr>
<td>AUX</td>
<td>10</td>
<td>0,284</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These 15 manual structures make up 195 of the 226 co-occurrences. The two largest manual occurrences are Noun and Noun+signed Hun (N=37 respectively). They are quite proportionally dispersed in the corpus, roughly falling into the lower range of the DP value (0-0,250), similar to other more frequent elements like Noun+Pointing (N=15) or Verb (N=20). The term *signed-Hun* stands for “signed Hungarian morpheme” and refers to signs which express spoken Hungarian inflection explicitly, usually Case.

There are 18 different cases according to standard Hungarian grammar (Kiefer 2000). Thus, its frequency in the language is quite high. Signs referring to Case made their way into MJNY to some ex-
tent and many of them are used frequently, like: BA “into” in ISKOLA BA JÁR “school to go” meaning go to school.

There are repeated occurrences in the middle range of DP like Pointing (N=19), Noun+Verb (N=11) followed by and the less frequent ones.

Overall, the most occurrences come, of course from S2. Even in proportional view the other signers produce less from this type of co-occurrence than expected based on their amount of overall mouthings. Nevertheless, there are always a few occurrences from other signers, too. Some of them like Noun+sign Hun and Noun+Pointing proportionally follow the amount of full mouthings in signers.

The last group to be discussed involves nominals in mouthings on which plurality is marked (N= 41). The following table shows all the manual co-occurrence patterns found during the production of these mouthings.

**Table 21: Signs co-occurring with nominal mouthing inflected for plural (N=41)**

<table>
<thead>
<tr>
<th>Sign word class</th>
<th>Freq</th>
<th>DP</th>
<th>Sign word class</th>
<th>Freq</th>
<th>DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noun</td>
<td>13</td>
<td>0,250</td>
<td>Noun+Noun</td>
<td>2</td>
<td>0,474</td>
</tr>
<tr>
<td>Adjective</td>
<td>5</td>
<td>0,367</td>
<td>Noun+Pointing</td>
<td>8</td>
<td>0,525</td>
</tr>
<tr>
<td>Noun+Verb</td>
<td>2</td>
<td>0,417</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I found 16 different manual structures in the 41 co-occurrences. 5 of the 16 structures occurred repeatedly and made out most of the subset (30 occurrences out of 41). The rest of 11 occurrences have all different one-time combinations. With other words, we get the same picture as in other subsets of the data corpus. There is a limited number of manual signs which make up the subset to a great extent; and there are other one-time occurrences. These collocations individually have small numbers and are distributed less proportional compared to the overall mouthing productions of the signers.
4.2.2 Research question 2: Congruence in grammatical meaning

The second specific research question was: Do the manual articulators express grammatical meaning which is congruent with the meaning indicated in mouthings (e.g. certain values of Person, Number or Case morphemes)? Let us have a look at the various patterns. The examples are in the same order as above: first Person-Number, then Case followed by Number in function of plurality marker.

**Morphological congruence**

Cases were found in those single MJNY-signs which are capable of showing inflections. These were agreement verbs e.g. AD “give” (N=10) or SEGÍT “help” (N=2).

(16)  
én segít-ek neked  
I help-1SG DAT.2SG  
PT1 HELP.1-x AUX.DAT1-x  
'I help you'

(17)  
ok megad-ta a kettes-t  
ok give-3SG. a two.ACC  
OK GIVE.x-1 NUM-GRADE:2  
'OK, he gave me a two'

In these cases the manual signs indicate the Person and Number of the subject and object. In (2) the 1sg subject marking in the mouthing comes along with the sign HELP which agrees with the first person subject as well (1-x). In (3) a backwards agreement verb GIVE marks the non-first person (or third person) subject as reflected in the mouthing megadta "he gave".

A further case where we see formal morphological alignment between hands and mouth comes in a few instances of verbal classifiers. In (4), the mouthing felálltunk “we stood up” co-occurs with the two-handed sign CL-thumb_stand-up. In this case it can be argued that plural Number is indicated both orally and manually. Plus, the mouth shows the explicit Person–Number reference (1pl. “we
stood up”) and the classifier encodes the spatial relation of two human entities standing up next to each other.

(18) feláll-tunk
we. stand.up-PAST.1SG
CL.THUMB.2hd ‘stand.up’
‘we stood up’

In case of single nouns expressing the possessor, we do not see manual instances which would show grammatical congruence.

In mouthed person-marked adverbs we see co-occurrence with auxiliary signs. Similar to other sign languages, these verbal auxiliaries have the function of indicating the Person and Number of the subject and object. In that, they fulfill the role of agreement verbs as they usually occur together with plain verbs, or in this case, adverbs. The signs AUX-FOR (for or to someone) AUX-WITH (with someone) AUX-TO (to someone) appears repeatedly in the corpus.

Similar to what Rathmann suggests for the DGS sign PAM-FUER (see Rathmann 2003), these signs play the same auxiliary role with the additional meaning of case in the MJNY examples. In this, they can actually correspond to Person, Number and Case of mouthed Hungarian instances like ‘nekem’ “to me”, ‘veled’ “with you”, ‘hozzá’ “to(ward) him/her”. Example can be seen in (5).

(19) nem volt probléma vel-em
not COP.1SG problem INS.1SG
NOT-BEEN PROBLEM AUX-WITHx-1 GESTURE
‘There was no problem with me’

One of the most important addition to nouns, verbs and adverbs is a pointing sign which has to be mentioned here. This is the usual formal strategy used by all 6 signers to indicate what the mouthing shows through inflections.

In verbs, the manual sequence which appears all over the corpus is Verb+Pointing (N=67). Here the pointing contains in 63 of 67 cases a simple indexical sign with a G handshape. There are 2 reflexive pointing signs (PT-REF) and a dual pointing sign (PT-DUAL). With the exception of one spatial verb JÁR “go regularly” all the signs are
plain verbs. The next table shows some of the verbs for the Verb+Pointing co-occurrence.

In nouns 5 of the 6 signers produce repeatedly the Noun+Pointing structure (N= 35).

This strategy in the corpus is the utilization of the noun and a pointing sign indicating the Person and Number of the possessor equivalently to the inflection in the mouthing. Here, the pointing can be a B handshape possessive pronoun showing also the Possession manually. However, the personal pronoun with the G handshape occurs overall more frequently. A dual pronoun can also express the Person and Number.

Table 22: Examples for Verb+Pointing sequences

<table>
<thead>
<tr>
<th>Signs</th>
<th>Freq</th>
<th>Signs</th>
<th>Freq</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUD(_neg) PT1</td>
<td>14</td>
<td>MOND PT</td>
<td>1</td>
</tr>
<tr>
<td>“not know”</td>
<td></td>
<td>“say”</td>
<td></td>
</tr>
<tr>
<td>EMLÉKSZIK.O(_neg) PT1</td>
<td>9</td>
<td>VOLT PT1</td>
<td>3</td>
</tr>
<tr>
<td>“not remember”</td>
<td></td>
<td>“been”</td>
<td></td>
</tr>
<tr>
<td>CSINÁL PT</td>
<td>8</td>
<td>VOLT PT1-NUM:4</td>
<td>1</td>
</tr>
<tr>
<td>“do”</td>
<td></td>
<td>“been”</td>
<td></td>
</tr>
<tr>
<td>AKAR PT1</td>
<td>4</td>
<td>FOGAD PT1</td>
<td>“ac-</td>
</tr>
<tr>
<td>“want”</td>
<td></td>
<td></td>
<td>cept”</td>
</tr>
<tr>
<td>MOND PT1</td>
<td>3</td>
<td>FOGAD PT1-REF</td>
<td>“ac-</td>
</tr>
<tr>
<td>“say”</td>
<td></td>
<td></td>
<td>cept”</td>
</tr>
</tbody>
</table>

(20) any-ám
mother-1SG.(POSS)
PT MOTHER PT1.POSS
‘my mother’

(21) főnök-öm
boss-1SG.(POSS)
BOSS PT1 TEACH1-x
‘my boss taught me’
When it comes to the Case morpheme, congruence is brought about by the collocation consisting of a noun with Case inflection in mouthing and the Noun+signed Hungarian (signed-Hun or sH for short) sequence in the manual channel. The 37 occurrences are almost exclusively one-time combinations of different nouns and signed Hungarian elements. What is more important to show is the kinds of signed Hungarian sign which appear as a manual expression of the Case marking, thus corresponding to the inflection in mouthing, The signed Hungarian elements are generally considered to have their origin in the spoken language. Their status in MJNY is still disputed. As these sequences in the utterances often appear as fully mouthed noun and verbal phrases, it is fair to say that they represent a Hungarian-dominant language production, a sign-to-sign translation of the Hungarian morphological structure. These findings are in correspondence to previous descriptions of Hungarian influence on MJNY.

Racz (2010) found preliminary evidence for different mouthing patterns. Similarly to findings of Schermer (1990) and Lucas-Valli (1992), mouthings which showed stronger Hungarian influence on morphological and syntactic level were accompanied by more Hungarian-based sign structures (2010:46).

Also, Szabo (2013) provides a collection of examples for Hungarian influence on the lexicon, morphology and syntax of MJNY. These include (1) the impact of different fingerspelling systems on MJNY in form of initialized signs, (2) the use of Signed Hungarian morphemes (signed version of spoken Hungarian affixes) and (3) Hungarian word order in MJNY.

13 of the possible 18 Cases of Hungarian occurred in the mouthing sample. The table below shows which of the corresponding signed Hungarian signs are produced as an equivalent for these mouthed case markers.
Table 23: Types of signed-Hungarian items in the corpus

<table>
<thead>
<tr>
<th>Signs</th>
<th>Case value</th>
<th>Freq</th>
<th>Signs</th>
<th>Case value</th>
<th>Freq</th>
</tr>
</thead>
<tbody>
<tr>
<td>sH-TO</td>
<td>Illative:</td>
<td>-ba/-be</td>
<td>4</td>
<td>sH-IN</td>
<td>Inessive:</td>
</tr>
<tr>
<td></td>
<td>“into”</td>
<td></td>
<td></td>
<td>“in”</td>
<td></td>
</tr>
<tr>
<td>sH-FROM</td>
<td>Ablative:</td>
<td>-tól/-től</td>
<td>4</td>
<td>sH-TO</td>
<td>Allative:</td>
</tr>
<tr>
<td></td>
<td>“from”</td>
<td></td>
<td></td>
<td>“to(ward)”</td>
<td></td>
</tr>
<tr>
<td>sH-OUT.OF</td>
<td>Ellative:</td>
<td>-ból/-ből</td>
<td>7</td>
<td>sH-WITH</td>
<td>Instrumental:</td>
</tr>
<tr>
<td></td>
<td>“out.of”</td>
<td></td>
<td></td>
<td>“with”</td>
<td></td>
</tr>
<tr>
<td>sH-ONTO</td>
<td>Sublative:</td>
<td>-ra/-re</td>
<td>3</td>
<td>sH-TO</td>
<td>Terminative:</td>
</tr>
<tr>
<td></td>
<td>“onto”</td>
<td></td>
<td></td>
<td>“to”</td>
<td></td>
</tr>
</tbody>
</table>

I found 8 of the 13 Case values in manual form that were produced in mouthings. The two most frequent were the sH-BÁN with inessive and the sH-BŐL with ellative meaning. (N=7 respectively). The manual signs express the same meaning as the inflection in mouthing.

(25) jó-ban                   rossz-ban
good-INESSIVE       bad-INESSIVE
GOOD sH-IN, BAD sH-IN
'in good and in bad (times)'

(26) történelem    szak-ra                          jelentkez-t-em
history          major-SUBLATIVE       apply-PST-1SG
HISTORY MAJOR sH-FOR APPLY
'I have enrolled in History major'

Signed Hungarian also occurs in other combinations and alone. In 7 cases it appears after different pronouns and numeral signs.

(27) négy-től                          nyolc-ig
four-ABLATIVE          eight-TERMINATIVE
NUM:4 sH-FROM        NUM:8 sH-TO
'from four to eight'
There are other options, too, when it comes to accompanying case-marked mouthings. The next group consists of collocations with pointing signs. There are 15 examples of Noun+Pointing collocations, most of them are one-time occurrences. In most collocations the case marker refers to locative or directional meaning, e.g. ‘iskolában’ ”at school” ‘levelezőre’ “for/to part time enrollement”. The pointing sign in function of a demonstrative pronoun refers to the location or direction of the noun (place etc.).

(28) sarok-ban
   corner-INESSIVE
   CORNER PT
   ‘in the corner’

(29) szövetség-be
   association-ILLATIVE
   ASSOCIATION PT
   ‘(going) to the association’

In one interesting case, the instrumental ‘val’ “with” is used with a dual pointing sign referring to the subject and the indirect object in the utterance.

(30) férjem-mel
   husband-INSTRUMENTAL
   SPOUSE PT1-DUAL
   ‘with my husband’

In 5 cases a verb is added to the manual structure in Noun+Pointing+Verb or Noun+Verb+Pointing structure. The pointing has the same function here as described. The adding of a verb assumedly has temporal coordination reasons as mentioned before.

(31) lány-om
    daughter-1SG(POSS)
    angiá-ban
    England-INESSIVE
    DAUGHTHER
    ENGLAND PT WORK
    ‘my daughter works in England’
Finally, one interesting co-occurrence type has to be mentioned: mouthing spreading over 4 signs. In these collocations the patterns that were discussed in this subsection occur with additional signs. The main reason is assumed to be the length of the full mouthing (4 and 6 syllables) and the temporal coordination of the two channels.

In example 20 the mouthing inclusively the Case morpheme is accompanied by the morph-to-morph translation in signs followed by an adjective in the function of a predicate and a pronominal pointing sign. The only difference to examples discussed so far is the involvement of manual signs beyond those in connection to Case reference.

(32) hallókészülék-től
    hearing.aid-ABLATIVE
    HEARING AID sH-FROM DEAF PT1
    ‘I became deaf from hearing aid’

When it comes to plurality, manual congruence is demonstrated by the combination of Noun+Pointing.

(35) siket-ek    vagy-unk
    deaf-1PL     OP-1PL
    DEAF        PT1.PL
    ‘we are deaf’

In 1026 the adjective in mouthing is temporally aligned with an adjective and a pointing sign, the second indicating the reference to plurality. However, the next mouthing vagyunk “are” is the predicate part of the mouthed structure. The sign could also be interpreted as preceding this Person-Number marking.

(36) rossz-ak    vagy-unk
    bad-1PL      COP-1PL
    BAD          PT1.PL
    ‘we are bad’

In three other cases mouthing expresses plural with inflection and the manual signs with the help of a classifiers. These classifiers depict multiple entities, e.g. in 1046 with CL-sok-ember-néz “many entities look at”.

No grammatical congruence

The larger part of the utterances showed no manual congruence with the inflection. The meaning is only indicated by the mouthing while the signs do not express it or express other content.

The two big groups (single Verb and Noun) demonstrate well that signers often choose not to express the inflectional meaning manually. For example: Most of the verbs produced are plain verbs where only the mouthing shows the different paradigms and values of Hungarian. The MJNY signs, by their formal characteristics (e.g. body-anchored signs) simply do not make reference to morphology. If it happens, that comes with an additional pointing sign or AUX, as mentioned previously, which can express inflectional meaning. For exemplifying this situation in the corpus, we can show here a more frequent plain verb MOND “say” used by all signers which comes along with a variety of inflectional suffixes in the mouthing.

Table 24: the sign MOND “say” co-occurring with various inflected mouthings

<table>
<thead>
<tr>
<th>Mouthing</th>
<th>Person-Number value</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>(el)mondćam</td>
<td>1Sg.</td>
<td>10</td>
</tr>
<tr>
<td>mondom</td>
<td>1 Sg.</td>
<td>9</td>
</tr>
<tr>
<td>mondćta</td>
<td>3 Sg.</td>
<td>8</td>
</tr>
<tr>
<td>mondjáék</td>
<td>3 Pl.</td>
<td>1</td>
</tr>
<tr>
<td>mondja (el)</td>
<td>3 Sg.</td>
<td>2</td>
</tr>
<tr>
<td>mondanám</td>
<td>1 Sg.</td>
<td>1</td>
</tr>
<tr>
<td>mondtáék</td>
<td>3 Pl.</td>
<td>1</td>
</tr>
</tbody>
</table>

The sign MOND “say” occurs 32 times in the corpus together with an inflected form of the Hungarian translational equivalent “mond”. In terms of Person and Number, the 1Sg comes in three forms, 10
How mouthings interplay with sign morphology

(38) nem emléksz-em
    not remember.1SG
    PT1 REMEMBER.NEG GESTURE
    'I do not remember'

Finally, we can see all sorts of additional signs which fall in the time frame of the inflected mouthings. However, they express other parts of the utterance, eg. spatial relations. As an example we can see below, how classifiers are synchronized with inflected mouthings. Such cases confirm prosodic alignments similarly to Crasborn et al. (2008).

(39) emléksz-em
    remember-1SG
    REMEMBER CL-'timeline'
    'I remember'

In this example the MJNY classifier after the verb refers to the period of time of which the signer remembers.

In (40), the object of the verb in form of a SASS (size and shape specifier) classifier refers to a noun of the previous sentence, the wife of the signer. The mouthed verb also indicates third person object, hence, this expression has also a convergent characteristic, however, not in the sense of Person and Number marking.
With the Case morpheme, a main strategy is the use of a noun sign with no grammatical or semantic reference to the case marker in mouthing (N=37). Similarly to examples discussed so far, in such groups the meaning of the inflection is provided only through the mouthing. Almost all the nouns are one-time occurrences mostly produced by S2. An example for three-time collocations is the mouthing ‘családból’ “from family” with CSALÁD “family” and for two-time collocations the mouthing helyet’ “place” with the sign HELY “place”.

(41)  siket   család-ból   származ
deaf     family-ELLATIVE   com.from
       DEAF FAMILY     COME-FROM
' I come from a Deaf family’

(42)  bocsánat már   betölt-ött-ék   ez-t a   hely-et
      sorry already   fill-PST.3PL   this-ACC   place-ACC
      SORRY ALREADY  FILLED        PT1     PLACE
'Sorry, this place has already been filled’

As for plural marker, 13 instances were found without indication for plurality in the manual channel, produced by 4 of 6 signers. These instances involve only 5 different nouns.

Table 25: Noun signs without indication of morphological congruence

<table>
<thead>
<tr>
<th>Signs</th>
<th>Freq</th>
<th>Signs</th>
<th>Freq</th>
</tr>
</thead>
<tbody>
<tr>
<td>BARÁT</td>
<td>3</td>
<td>SIKET</td>
<td>2</td>
</tr>
<tr>
<td>CSALÁD</td>
<td>3</td>
<td>SZÚLŐ</td>
<td>4</td>
</tr>
<tr>
<td>NAGYSZÚLŐ</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The sign BARÁT comes together with both general plural marker -ok: barátok "friends" as well as with the possessive allomorph -i:barátaim "my friends". The signs SIKET “Deaf” co-occurs with the plural marker -ek: siketek "the Deaf". The signs CSALÁD “family” and SZÜLŐ “parents” both appear together with the variations of the same mouthing születí “my parents”, születí “my parents”.

On the five manual adjectives, plurality is not expressed. The same applies to other co-occurrences like Noun+Noun and Noun+Verb. The rest of 11 co-occurrences in this subset are individual cases.

4.3 Summary

The main question of this paper was to what extent the 6 signers from my MJNY corpus synchronize their manual and oral expressions in terms of the inflectional meaning attested in the mouthing. With other words: what do the hands do while the mouth marks inflections? The Hungarian categories Person, Number and Case were under investigation.

The first specific research question focused on the manual patterns by which morphological meaning is expressed.

The qualitative analyses showed that signers can simultaneously express the meaning of Person, Number and Case manually, time-aligned with the inflected mouthings. This can happen by using agreement verbs, pointing or auxiliary signs indicating Person and Number. The Case markers, given the fact that MJNY does not exhibit Case in its inflectional morphology, are echoed by the insertion of signed Hungarian suffixes, which go beyond the core vocabulary of MJNY but nevertheless wide-spread in the MJNY language use. For Case, a pointing sign in function of a demonstrative pronoun can also express the same meaning as the inflection.

The second specific question was whether manual signs show morphological congruence to inflections in mouthings. This has been confirmed in a subset of the overall data (36% of the analyzed corpus).

In most of the 339 utterances, however, we see no morphological alignment. Instead, only the mouthing is used for the Person, Num-
ber and Case markers (64% of the analyzed corpus). If the mouthing spreads over signs, the informants do not express these categories manually; the signs rather show other parts of the utterance, eg. different spatial information (with classifiers) or simply discourse functions e.g. through gestures. The following table summarizes these findings in an overview.

**Table 26: Summary: Hungarian inflectional markers and types of manual co-occurrences**

<table>
<thead>
<tr>
<th>Inflectional markers</th>
<th>Morphological congruence</th>
<th>No congruence</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person–Number</td>
<td>165</td>
<td>308</td>
<td>473</td>
</tr>
<tr>
<td>Case</td>
<td>88</td>
<td>138</td>
<td>226</td>
</tr>
<tr>
<td>Nominal number (plurality)</td>
<td>13</td>
<td>28</td>
<td>41</td>
</tr>
<tr>
<td>Sum</td>
<td>266 (36%)</td>
<td>474 (64%)</td>
<td></td>
</tr>
</tbody>
</table>

The table clearly shows that the corpus indicates the possibility of the proposed morphological congruence: that is, mouthings and manual signs are not only synchronized semantically and prosodically, but also morphologically. Analogue manual constructions appear in sequences where the mouthing is accompanied by one or more signs. These findings have not yet been systematically found in other sign languages. Although we clearly speak about optional strategy, 36% of the 339 utterances exemplify this. It suggests that signers make use of synchronicities in Hungarian and MJNY if the two languages match up together in an utterance so that it makes it possible to express inflectional meaning simultaneously. Although the data suggest individually colored, optional strategy, nevertheless a very interesting one in terms of the language production capacity of sign–spoken bilinguals.

**5. Discussion**

My primary aim in this study was to better understand what the Hungarian data might suggest about the bilingual language use and the spoken influence on MJNY. The insights gained out of this investigation can be summarized as follows.
In essence, this empirical study partially confirmed the idea of the simultaneous marking of inflectional categories in a subset of the corpus. The findings reveal that MJNY users can creatively utilize their different articulators to mark inflectional categories. We can also see a great amount of precise synchronization of mouthings and manual signs. The characteristic of mouthings to spread over signs turned out to be a useful tool to investigate the relevant time frames in the corpus.

It also turned out that manual signs do not refer most of the time to Hungarian inflectional categories explicitly. Instead, Person, Number and Case are displayed only in the mouthings, living the manuals free to express other aspects, like spatial relations etc. In that sense, hands and mouth can often appear in mutual functional disperse, rather than showing redundant expressions. The findings suggest that signers use mouthed inflections in addition to their MJNY utterance and possess high level of control in case they do indicate signs which semantically, prosodically and morphologically fit these instances.

In terms of spoken influence, I recall that mouthings with inflections are often considered to be instances of contact signing or other forms of spoken-language-oriented signing. In my corpus, which can be seen as good example for natural MJNY production, these mouthings appear in a morphosyntactical environment where strong Hungarian impact on the signing is not attested.

An exception can be mentioned in the case of signed Hungarian morphemes like BA, RA, TÓL which are all suffixes. As Szabó (2013) suggest, if these elements appear in MJNY, we can assume a stronger influence from Hungarian. This can be confirmed by my analysis. Signed Hungarian appears dominantly in Signer 2 who generally shows more activation for Hungarian. Demonstrating a high command of Hungarian, she often uses extended, more continuous sequences compared to other signers.

It is important to emphasize the wide range of individual patterns among the manual co-occurrences which made it to be a challenge to summarize the main, rather characteristic types in this paper.
However, there seems to be a few re-occurring patterns, which hint at more typical behavior in MJNY. In case one built a more comprehensive and multi-faceted corpus for MJNY, in which mouthing were part of the data, I would propose that we could see pointing signs to appear aligned with inflected mouthings, as well as some signed-Hungarian translation equivalents and AUX signs. A high level of synchronization between such mouthings and their corresponding manual signs is also expected. Frequency of such inflectional marking would increase the more formal the discourse types get.

If we want to connect these findings to the results of previous work, it can be stated that they are in line with and extension of the implications of the first study (Racz-Engelhardt 2016). Mouthing with Hungarian inflection do appear in informal MJNY discourse. Manual signs can co-occur with these mouthings with the possibility of referring to the inflectional meaning of Person, Number and Case. Due to many idiosyncratic patterns, it is not possible to show exact behavior of these co-occurrences, nor to predict when they appear. However, they usually follow prosodic structures of mouthings.

The findings imply that a bilingual language user can incorporate even grammatically meaningful markers from a spoken language into the signed utterances. Plus, they can be used intertwined with manual signs. We see sequences where these mouthings are strongly entangled with the manual structure in terms of inflection, but many cases where they appear as „add-ons”, insertions from spoken grammar (cp. Bank et al 2011) and do not seem to affect the MJNY morphosyntactic structure.

Instead of posing the question whether these instances constitute part of MJNY or not, I would like to draw the reader’s attention to the fact that these findings are in line with the linguistic reality in Deaf communities. Various studies stated that on the one hand mouthings are omnipresent, on the other hand their formal characteristics are highly variable, not consistent in use, thus hardly predictable (Keller 2001). This also applies to the Hungarian data. In fact, sign language users, like other bilinguals, make use of many mixed patterns, which underlie episodic, dynamic changes in these signing discourses.
If we take a bilingual perspective here, we could argue that all elements belong to one usage-based “feature bubble”. Let us call it the bilingual repertoire, an expression of the unique linguistic configuration of the users. Here we look at language as practice rather than language as system.

With this perspective we can understand that it is absolutely possible for a sign language to exploit communicative resources of another linguistic system, if it fits the user’s sociocultural needs and seems to be supported by some kind of communicative economy. This paper suggests that mouthing with inflection and with its specific manual co-occurrence patterns, is an example of the multimodal nature of human communication.

This brings us a step further toward theoretical implications. From the beginning of the corpus analysis up to date, I interpreted the findings in a language contact framework. I argued – following Grosjean’s view (2008) – that signers’ bilingual repertoire can be seen as a third system with unique patterns, coming from two source languages, Hungarian and MJNY, and being dynamically applied in use.

However, as Racz-Egelhardt (2016) showed there could not be given any detailed theoretical explanation for these findings based on classical language contact models. It may imply that we should extend our horizon if we want to account for such semiotic phenomena like mouthings and such complex but highly coordinated linguistic behavior as the bilingual and cross-modal language use in Deaf communities.

Research on language contact, functional linguistics and the accumulating evidence coming from the study of multimodality of linguistic expressions fundamentally challenge the traditions of Saussure and Chomsky confronting us with a different picture of language. This paper also encourages us to revisit some fundamental questions in linguistics that might challenge the way we used to think about human language.

Research on sign languages, gestures, multilingual and multimodal settings is providing a growing body of evidence that supports the idea that language is based on an inextricable polysemantic entanglement of visual and verbal modes and drives on interactional
and discursive functions. This draws a picture of language as a much more malleable, context dependent set of semiotic features rather than a consistent system within itself.

However, despite strong empirical foundation, the conceptual landscape of contemporary research still reveals the unsolved root conflict which is exemplified by the very distinction of language and communication. We are still in lack of a general acceptance of a theoretical framework which acknowledges multimodal and expressive aspects of language and can even integrate the so called verbal and non-verbal properties in one overarching model. Such a model could shape our understanding of language by drawing attention to the essential role of visual properties and multi-channeled expressions, advocating an approach that acknowledges primary, embodied language as multimodal.

6. References


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How mouthings interplay with sign morphology


