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# Towards a Classification of Weak Hand Holds

**Abstract:** The two symmetrical manual articulators (the hands) in signed languages are a striking modality-specific phonetic property. The weak hand can maintain the end position of an articulation while the other articulator continues to produce additional signs. This weak hand spreading (hold) has been analysed from various perspectives, highlighting its prosodic, syntactic, or discourse properties. The present study investigates corpus data from Sign Language of the Netherlands (NGT) and Russian Sign Language (RSL), two unrelated sign languages, in order to question the necessity of a sign-language specific notion of 'buoy' introduced in the discourse analysis of American Sign Language by Liddell (2003). Buoys are defined as weak hand holds that serve as a visible landmark throughout a stretch of discourse, and several types are distinguished based on their function and form. In the analysis of nearly two and a half hours of narratives and conversations from NGT and RSL, we found over 600 weak hand holds. We show that these holds can be analysed in terms of regular phonetic, syntactic, semantic, or discourse notions (or a combination thereof) familiar from the linguistic study of spoken languages, without the need for a sign language-specific notion of 'buoy'.

## 1 Introduction

One important difference between signed and spoken languages is in the use of articulators. For sign languages, the hands are the main articulators. Among other things, hands are independently movable, and this property gives them the potential to express different pieces of information simultaneously – something that is not possible in speech. It may be argued that a more appropriate comparison is between signing and audio-visual speech (including gesture), and from this perspective, spoken language also exhibits simultaneous articulation. Speech is accompanied by gestures of the hands and face, and even within the auditory signal segmental and suprasegmental features are produced simultaneously. However, a clear difference is that the vocal-auditory channel does not afford the simultaneous production of distinct lexical items (i.e., two words at the same time), but this is possible in the manual channel. In Figure 1 a signed utterance meaning 'he is offended' in Russian Sign Language (RSL) is depicted; the two signs are realised with the two hands simultaneously.

Although possible in principle, the fully simultaneous articulation of several signs is for the most part restricted to poetry and word play (e.g., Crasborn 2006). However, another type of manual simultaneity is common in casual signing in most sign languages described so far (but see Nyst 2007 on the lack of simultaneity in Adamorobe Sign Language). In a simultaneous manual hold, the movement of the two hands is not

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fully simultaneous, but rather one sign is articulated first (by one or both hands) and then one hand (the strong hand) continues signing while the other (the weak hand) maintains the end state of the first sign[1]. This latter type of simultaneity has been described for a number of sign languages, and has been referred to as 'simultaneous construction' (Vermeerbergen et al. 2007), 'weak hand spreading' (Van der Hulst 1996), 'non-dominant hand spreading' (Sandler 2006), and 'buoy' (Liddell 2003) – although these authors in part refer to different phenomena or look at different aspects of the same phenomena.



**Figure 1.** The equivalent of the English sentence "He is offended" in Russian Sign Language (RSL) with the pronoun on the left hand and the sign offended on the right hand.

The first peak of interest[2] in the topic of manual simultaneity was in 1994, which marked the publication of several papers. Miller (1994a, 1994b) discussed manual simultaneity in Quebec Sign Language (LSQ). In his first paper, he described the following formal types of simultaneous constructions in LSQ (Miller 1994a):
1. pointing sign simultaneous with other signs
2. perseveration of a previous sign
3. enumeration sign, that is, a numeral handshape held to represent a particular number of referents, where individual digits can be pointed at
4. fully simultaneous articulation, when two full signs are articulated together

Miller came to the conclusion that the main function of simultaneous constructions was to background information: the central piece of information is presented with the strong hand, while the peripheral piece is held on the weak hand. In his second paper, Miller (1994b) argued that some complex predicates (namely classifier constructions) in LSQ have morphemic parts (expressed by the weak hand) and that this hand can be held and used as morphemes in the following signs.

Engberg-Pedersen (1994) analysed simultaneous constructions in Danish Sign Language, focusing on simultaneous constructions involving classifier predicates. She identified several functions of simultaneity, including expressing spatial relations between referents (which she considers the central type of simultaneous constructions), backgrounding of information, and expressing morphological relations.

A few years later, Miller (2000) proposed a more elaborate analysis of weak hand holds in LSQ. He made an attempt to classify holds into categories according to their functions and forms, which resulted in the following list:
1. Locative constructions
2. Holds of verbs or predicative adjectives to encode simultaneous events
3. Holds of nouns to encode topical elements
4. Holds of pronominals and determiners to encode a syntactic relationship (between a subject and a predicate or a determiner and a noun)
5. "Oppositive/synthetic" constructions to encode contrast between elements[3]

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**1** Apart from the terms "weak hand" and "strong hand" used here, others have used terms "dominant" and "non-dominant" hand, although these terms are not always used interchangeably.
**2** As an anonymous reviewer correctly pointed out, other researchers had discussed weak hand holds earlier (Frishberg 1985), but 1994 was the first year when several papers devoted specifically to holds appeared.
**3** First discussed by Frishberg (1985).

Miller used this classification to argue that a syntactic account of holds should be developed. He hypothesised that sign languages may have a procedure of linearization different from spoken languages and that simultaneous constructions may derive from the notion of c-command (for a related proposal see Kimmelman 2015).

While the analyses of Miller and Engberg-Pedersen focused on syntactic processes, other authors offer a prosodic perspective on some weak hand holds. Nespor and Sandler (1999), for example, argue that in Israeli Sign Language there are weak hand holds that have a rhythmic function and are restricted to the phonological phrase. A similar proposal within a slightly different model of sign language phonology is offered in Van der Hulst (1996). More recently, Brentari and Crossley (2002) analysed data from ASL in similar terms and came to the conclusion that weak hand holds are indeed indications of prosodic boundaries, although not only of prosodic words but of larger units as well.

Perhaps the most widely known approach to weak hand holds is the analysis first developed by Liddell (2003; Liddell, Vogt-Svendsen, and Bergman 2007), who emphasised the role of holds in the structuring of discourse. He introduced the now widely used notion of buoys: formally defined as weak hand holds which have discourse-related functional properties. He suggested the following types of buoys:

1. *Pointer buoys* are holds of pointing signs used to emphasise important referents.
2. *List buoys* occur when the fingers of the weak hand are associated with referents and the hand is used for enumeration.
3. In the case of *theme buoys*, an index finger extended upwards is held to highlight the importance of a part of discourse.
4. *Fragment buoys* occur when other types of signs are held; "fragment" refers to the fact that not the sign as a whole but only its location, orientation, and handshape are preserved by the weak hand as a sort of fragment left over from the production of the full sign. No specific function is attributed to this type of buoy, making them similar to the type of spreading discussed by Sandler (1999) for ISL and Brentari and Crossley (2002) for ASL.
5. *Depicting buoys* are part of what Liddell (2003) calls a depicting space.

The list of buoys was further extended in Vogt-Svendsen and Bergman (2007) with the description of *point buoys*, where a pointing sign serves as a locative or temporal anchor.

There are two important interconnected properties of Liddell's approach that are relevant to the rest of this article. Firstly, the different types of buoys are distinguished based on both function and form. For instance, pointer buoys involve pointing signs (form) and refer to important referents (function); list buoys involve numerals (form) and are used to enumerate (function); theme buoy involves pointing upwards (form) and is used to signal importance of what is being said (function). Secondly, the notion itself is modality-specific: there are no parallels to this notion in spoken languages, and not just formally (there is no second independent articulator), but also functionally, that is, there is no single grammatical marker in spoken languages that expresses the bundle of meanings expressed by buoys.[4] Based on our analysis of RSL and NGT data, we will question both of those features of the notion of buoy, because while we see that there are some form-meaning correspondences (albeit much less strict that in Liddell's analysis), we suggest they are better analysed in terms of standard grammatical terms, not using the buoy metaphor as a label that suggests something modality-specific that we believe is not there.

If we compare Miller's (2000) proposal with Liddell's (2003) typology of buoys, we can see that their categories of weak hand holds do not exactly correspond to each other. While Liddell's theory focuses on the overall discourse function of highlighting and backgrounding and categorising holds according to the type of the sign on the weak hand that is involved, Miller agrees with the overall semantic functions of holds, but goes beyond this in trying to categorise functions in terms of grammatical structure (Table 1).

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**4** As we demonstrate throughout the paper, the meanings of different subtypes all have parallels in spoken languages, so our claim here is that the collection of meanings of buoys is not expressed by a single grammatical category in spoken languages.

**Table 1.** Comparison of two attempts at categorizing weak hand holds, one focusing on form, the other on function.

| Liddell 2003, Liddell et al. 2007 on ASL | Miller 2000 on LSQ |
| --- | --- |
| pointer buoys | pronominals and determiners |
| list buoys | pronominals |
| point buoys | locative constructions |
| fragment buoys | verbs or predicative adjectives nouns |
| theme buoys | |
| | "Oppositive/synthetic" constructions |

The same types of holds are treated differently by these two approaches. For instance, pointing signs according to Liddell and his colleagues are used either to emphasise important referents or for temporal and spatial anchoring, while for Miller they are used to express syntactic relations. Liddell's theme buoy and Miller's "oppositive/synthetic" constructions do not have counterparts in the other approach.

In the present paper, we address the question whether we need a notion like 'buoy' that is unknown for spoken languages, or whether we can categorise weak hand holds in a way similar to Miller's analysis for LSQ, using terminology familiar from the analysis of spoken languages. Thus, although the ability to maintain a lexical item while producing another one is specific to the manual modality, the functions of these phenomena are not modality-specific. To do this, we investigate weak hand holds in corpus data from two unrelated sign languages, Sign Language of the Netherlands and Russian Sign Language. In our analysis, we try to categorise holds in terms of their linguistic source, that is, the category of the sign that is being held, and the functions of the hold. Our overall conclusion will be that an analysis in terms of well-known linguistic properties is possible, and that a sign-language-specific notion of 'buoy' is not needed. We will argue that holds are modality-specific because they exist due to the presence of two partially independent articulators, but that sign languages exploit them to express linguistic information that is itself independent of modality.

## 2 Methodology[5]

We first present the data sources that were used (section 2.1), then introduce the participants and describe their sociolinguistic characteristics (2.2), and finally explain the annotation procedure (2.3).

### 2.1 Data sources

The data analysed in this paper comes from recordings that were initially collected and annotated for other purposes. Before we present the data, we briefly introduce the two languages included in the study.

Sign Language of the Netherlands is a language used by deaf and hard of hearing people in the Netherlands. According to the estimation of Wheatley and Pabsch (2012), it is used as a first or preferred language by approximately 7,500 people. Russian Sign Language is a language used by deaf and hard of hearing people in Russia. According to the latest census organised in 2010, it is used by 120,000 people in the Russian Federation. Despite the differences in the number of speakers, the languages have some similarities: they both are approximately 200 years old, and since they are both used in Europe, they also share some common history. For both languages, a connection to French Sign Language has been reported, but this connection is not certain (especially so for RSL, see Bickford 2005). RSL and NGT have not been in active contact at any time. At least at the lexical level, the languages do not show much similarity. Therefore, it is informative to compare them with respect to weak hand holds.

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**5** Note that in this section there might be a textual overlap with Sáfár & Kimmelman (2015), as these two papers originate from the same project and the same methodology has been used.

### 2.1.1 Sign Language of the Netherlands

The NGT data used in this study comprised selected sessions from the Corpus NGT, recorded between 2006 and 2008 (Crasborn et al. 2008, Crasborn and Zwitserlood 2008). The sessions included in this study were selected in two phases. A set of cartoon descriptions and personal stories were selected for a project on information structure. A second set of recordings containing conversational data were selected from the same signers specifically for the study of weak hand holds. As a result, the NGT data set amounts to a total of 1 hour and 32 minutes of recordings from 15 signers, as summarised in Table 2. While data from narratives are available for all 15 signers, conversational data are available for 12 signers. As two-handed signs were annotated with two glosses (on separate tiers for the left and the right hand), the number of signs is smaller than the number of glosses (see section 2.3.1 below on annotation).

**Table 2.** Summary of the data set. Number of signs is an approximation based on preferred hand glosses.

| Language | Genre | Duration | Number of signers | Number of sessions | Number of glosses | Number of signs |
|---|---|---|---|---|---|---|
| NGT | Conversation | 31 mins. | 12 | 13 | 4226 | 3085 |
| NGT | Narrative | 61 mins. | 15 | 41 | 7736 | 5248 |
| RSL | Narrative | 51 mins. | 6 | 38 | 8361 | 5513 |

In the cartoon retelling task, signers watched short cartoon clips from Canary Row (Freleng, 1950), a cartoon for children with a cat and a bird as the main protagonists, which has been widely used in sign language and gesture studies. Afterwards, their task was to describe the events in the clip to the other signer, who had not seen the clip. In the personal stories task, signers presented private recollections; the topics were not specified beforehand. In the conversation sessions, signers were asked questions related to deafness (for example, "Do you think deafness is a handicap?") that served as discussion starters. The questions were presented in the form of pre-recorded clips, in which a deaf signer presented an issue and asked questions related to it. Depending on the ensuing conversation, these sessions are typically around 3 minutes in length, but can be longer (up to 10 minutes).

### 2.1.2 Russian Sign Language

The Russian Sign Language data were collected in 2011. The corpus contains approximately one hour of signing by 6 deaf signers. Participants were filmed in pairs as they engaged in semi-spontaneous story telling based on memorable experiences, as well as describing short films to each other. Here, too, the topics were not specified in advance. The tasks used in the collection of the corpus were a subset of the tasks used in Corpus NGT, namely the cartoon retelling task and the personal story task. Thus, the RSL and the NGT corpora are comparable in terms of their content and how they were recorded, with the exception that conversational data, similar to the conversations in the Corpus NGT, was not available for RSL.

## 2.2 Participants

For both data sets, participants are all deaf signers who use NGT or RSL as their primary language. For the RSL corpus, data from six signers were collected. The mean age of the signers at the time of recording was 45 years, and the range was from 30 to 58 years. Two of the signers are male, and four are female. They all come from Moscow and have always lived and worked in Moscow. Five of the six signers can be classified as native signers, as they were exposed to RSL from birth; the sixth signer learned RSL before the age of 4.

NGT signers constitute a larger and, in some respects, more varied group. As mentioned above, 15 participants were included from the Corpus NGT, four men and eleven women. All signers are from the region of Amsterdam. Signers' mean age at the time of recording was 53, and ranged between 17 and 81 years. Seven

participants reported having at least one deaf parent, resulting in early exposure to NGT. Four signers were exposed to sign language before the age of 3, three signers between 3–6 years of age. One NGT signer reported late exposure to sign language (at 14 years of age).

## 2.3 Annotation

### 2.3.1 Pre-existing annotations

The Russian Sign Language data had already been annotated by the first author (with the help of RSL signers) prior to the study of weak hand holds reported here, including gloss annotations, sentence level translations, and aspects of information structure. The identification of clauses was based on semantics (a clause consists of a predicate with all its arguments and adjuncts) and prosody (clauses usually form one prosodic unit). For more details on the issue of identifying clauses and sentences in sign languages, see Ormel and Crasborn (2012). NGT narratives had been glossed in part by the Corpus NGT team and in part by the first author (again with the help of fluent NGT signers), while clause-level translations were completed by the first author in the same manner as with the RSL data. The conversational part of the dataset, consisting of conversation sessions from the Corpus NGT, included gloss annotations that were created up until 2008.

Gloss annotations were similar for both sign languages. Annotations were created for each sign on two gloss tiers, representing the right and left hand respectively. The glosses reflected the meaning of the sign. In line with the annotation conventions of the Corpus NGT, the activity of the each hand was annotated separately, so that – crucially for this project – if a hand was maintained in the same configuration after executing a sign, the length of the gloss annotation reflected this. One-handed signs were annotated on the tier corresponding to the hand articulating the sign, while two-handed signs received an annotation on each of the two hand-tiers (fully or partially overlapping, depending on the level of synchronization between the two hands) (see Figure 2).



**Figure 2** Screenshot of an ELAN annotation with each hand glossed separately.

As a result of this two-tiered approach to gloss annotation, the number of signs can be approximated by taking the number of glosses on the tier corresponding to the preferred hand of the signer (the hand used more often to articulate one-handed signs). For a discussion and analysis of the data in terms of handedness, we refer to Sáfár and Kimmelman (2015).

### 2.3.2 Annotations created for the present study

The annotation procedure involved coding weak hand holds[6] on multiple tiers. First, all holds were identified using a simple definition:

> The location and handshape of a sign are maintained on one hand while the other hand articulates at least one full sign.

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6 A note on terminology: in what follows, we use formulations such as "a hold of a nominal sign" as a shorthand for "a hold of the manual articulator of the nominal sign".

On one tier, called *hold*, the formal properties of the holds were described: handedness of the sign participating in the hold (whether it was one-handed, two-handed symmetric, or two-handed asymmetric; Battison 1978) and whether the hold was progressive (spreading forwards) or regressive. On a separate tier, called *hold right boundary*, we marked whether the right boundary of the hold coincided with a new sign on the same hand or not, that is, whether the hold ended because the hand that had been held participated in a new sign. We analyse these formal properties of holds in RSL and NGT in Sáfár and Kimmelman (2015).

Finally, on the last tier, named *hold function*, we listed the functions of holds in terms of categories we developed for this study. An initial set of categories was established based on the literature and adjusted during the first round of annotations. Next, the first and second author discussed the categories and established a final set of functions, which will be described in the next section. Annotations were then adjusted in accordance with the final set of categories.

The weak hand holds in the RSL corpus were annotated by the first author, and the holds in the NGT corpus by the second author. In order to ensure agreement, the annotations of each annotator were checked by the other annotator. The final dataset included only holds which the annotators agreed on (which constituted the majority of all potential holds).

The annotation of the full dataset resulted in 621 weak hand holds recognised by both annotators in the complete dataset of nearly 2.5 hours of signing from the two sign languages, excluding holds of listing signs (11 tokens) and palm-up gestures (34 tokens), as the analysis of the functions of these signs is beyond the scope of this study. Table 3 shows for each language and genre the number of potential holds and the number of holds included in the analysis.

**Table 3** Number of weak hand holds across genres

| Language | Genre | No. of glosses | holds |
|---|---|---|---|
| RSL | Narrative | 8361 | 350 |
| NGT | Narrative | 7736 | 171 |
| | Conversation | 4226 | 100 |
| **Total** | | 20323 | 621 |

# 3 Categories of holds

In this section, we describe the categories of holds based on the analysis of the data presented in section 2. We propose to categorise holds into four groups based on motivation: phonetic (section 3.1), syntactic (3.2), iconic semantic (3.3), and discourse-related (3.4). We use the term motivation as a general term reflecting our view that holds are not arbitrary: since it takes effort to maintain a hand in a particular location and configuration, something must motivate a hold. Furthermore, holds may be motivated by articulatory reasons (phonetic holds), or they may express a linguistic feature at some level (syntax, semantic, or discourse) – in the latter case we speak of a function of the hold. In the following subsections these types are further divided into categories and examples are provided. Phonetic holds are usually related to ease of articulation. Syntactic holds include holds of subjects, objects and verbs across the whole sentence, as well as holds of a nominal sign across the whole noun phrase. Holds with iconic semantic function often but not always appear in inter-clausal contexts and include holds expressing simultaneity and locative relations between objects. Discourse-related holds occur in intra-clausal contexts and have discourse-related functions such as marking a discourse topic or semantic relations between sentences.

These four groups are not mutually exclusive: a hold can have multiple motivations and functions. Below, for instance, we will discuss an example where a hold is used in the context of doubling (which we analyse as a phonetic motivation), but the held sign is also the head of a noun phrase. It is possible to look at the motivations and functions that we discuss above as different perspectives on the role of holds or different facets of holds. However, there are several reasons why we continue to use the terms motivations

and functions. First, we thus emphasise our view that holds occur in order to express linguistic features. Second, not all of the functions are compatible with each other. Finally and most importantly, in the quantitative part of our study reported in Sáfár and Kimmelman (2015) we found that 75% of holds in our sample can be assigned a single type, so it is definitely not the case that all holds have a phonetic, syntactic, semantic, and discourse function simultaneously. In this paper we focus on the classification of the functions of holds, while the issue of the possible combinations of functions is left for future research.

In addition to demonstrating the different types of holds, we also discuss the lexical source of the hold: whether it is a one- or a two-handed sign, and whether it is a lexical sign, a classifier, or a pointing sign.

## 3.1 Phonetic holds

Some of the holds clearly cannot be assigned a semantic interpretation, nor are they related to linguistic structure at some level: they appear for articulatory phonetic reasons.[7] A phonetic hold is usually a short hold during which the hand is held in some configuration for ease of articulation. For instance, a hand can be held because it is reused as a part of the following sign: in (1) the base hand of the sign SEVEN is immediately reused in the following sign EIGHT.[8] In these cases the weak hand does not lower or relax between the two signs, but handshape, orientation and location are maintained during the transitional movement of the strong hand.

(1)    [RSL:s2:s20 starts at 00:06.969]



H1:    APPROXIMATELY        SEVEN[9]—————————————————————————

H2:    APPROXIMATELY        SEVEN                        EIGHT      YEAR

'[He was] approximately seven or eight years old.'

Another reason for a hold to occur can be doubling. A hold for doubling may surface in a situation in which some sign appears twice in the utterance (with one or more other signs between the occurrences), and one hand is held from the first occurrence to the second one (2). One can say that the hold is phonetic in this case as well: the signer anticipates the second occurrence of the sign so the configuration and the location of the sign are preserved on the weak hand. For instance, in (2) the sign PIPE appears twice with the sign

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**7**  As we already mentioned, some holds have a syntactic, semantic, or pragmatic function, but in addition they can be phonetic in the sense that they are also related to ease of articulation. But there are also cases where no reason apart from ease of articulation can be found.

**8**  Glossing conventions: signs are glossed in SMALL.CAPS; if a sign is translated with more than one word, a full stop separates the words; in fingerspelled words, letters are separated with dashes (W-O-R-D). IX stands for index (pointing sign); -1, -2 stand for second and third person; CL: for a classifier. We use a two-line notation with separate lines for each hand (H1 and H2), and the line −− is used to show the scope of a weak hand hold. + is used to express simultaneous signs on two hands when a one-line notation is used in captions.

**9**  The signs SEVEN and EIGHT both use the base hand in the shape of B or 5 which can be analysed as expressing the meaning 'five'; however, the same base hand is used in numbers 15-17 where it cannot mean 'five', and also the passive hand in SEVEN and EIGHT has a different orientation from the sign FIVE, and often has the B-handshape which is not possible in FIVE, so we decided not to decompose the sign into meaningful parts FIVE and TWO/THREE.

WATER in between, so while signing water the weak hand of PIPE is held in anticipation of the second occurrence.[10]

(2)    [CNGT1774 S074 starts at 00:13.370]



H1:    PIPE                          WATER                          PIPE

H2:    PIPE————————————————————————————————————————————————————

       'water pipe'

Of course, for phonetic holds the lexical source of the hold type is of no importance: pointing signs, classifiers, and fully lexical signs can all be held for articulatory reasons. In addition, both one- and two-handed signs can participate in such holds.

Phonetic holds are mechanistic in nature: they are not used to convey a meaning or fulfil another linguistic function.[11] However, in many other cases the motivation for the hold is not mechanistic. Rather, the fact that the hand is held in such cases is meaningful, because there is a meaningful relation between the information expressed by the two hands, or functional, in that the hold contributes to expressing syntactic structures. We suggest that in these cases the hold is motivated by its function. Three such functions are discussed in the following three sections. We do not, however, wish to claim that these two opposites (meaningful/functional vs. meaningless/functionless holds) are mutually exclusive.

## 3.2  Marking a syntactic domain

Some holds in our data can be classified in syntactic terms. Note that we do not presuppose a particular syntactic framework here but instead appeal to basic descriptive linguistic notions, such as parts of speech (noun, verb, etc.), constituents (such as noun phrase), and grammatical functions (subject, object, etc.). We also consider the noun to be the head of a noun phrase, which is a common position in descriptive linguistics and typology. For a more explicit syntactic analysis of some holds, see Kimmelman (2015).

A common type of weak hand hold is when a head or a dependent in a syntactic constituent spreads across this constituent. The various contexts in which such holds occur are discussed below. The function of this hold type is to emphasise the corresponding syntactic domain. By definition, these holds therefore never spread across sentence boundaries.

Within noun phrases, a part of the head of the constituent (the nominal sign) can spread across its dependents (adjectives and pointing signs, which can be determiners or demonstratives), or a modifier (an adjective) can spread across the head noun (although this was not frequently observed). For instance, in (3) the noun cat spreads across the following pointing sign ix, while in (4) the adjective other spreads across the fingerspelled noun R-E-I-S 'flight'.

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**10**  Note that phonetic functions can combine with other functions; for instance, in this example the hold can also be characterised as syntactic (see next section).
**11**  An anonymous reviewer suggests that even in the cases where phonetic holds do not appear to have a function they probably would not cross sentence boundaries and thus can mark syntactic domain. However, the majority of the holds which we analysed as purely phonetic spread across short parts of sentences, not across complete syntactic domains. This is how we systematically distinguished purely phonetic holds from syntactic ones.

(3)      [CNGT0019 S003 starts at 00:11.345]



H1:   CAT                                    IX

H2:   CAT————————————————————

      'the cat'

(4)      [RSL:s1:s10 starts at 03:28.760]



H1:   OTHER                           R-E-I-S ('flight')

H2:   OTHER——————————————————————————

      'another flight'

Both one-handed (5) and two-handed (as in the examples above) nouns can be held in such a construction. As for the type of signs that could be held, they are usually lexical signs. In general, classifier constructions with the exception of size and shape specifiers (examples of which we did not have), are not nominal, so they would not occur in this hold type. Pointing signs can be nominal, but pointing signs are very unlikely to be modified, so again, they would not occur in this type of hold. Thus, holds marking a noun phrase originate in lexical signs, but this constraint is explained by factors not related to the hold itself.

(5)      [RSL:cr7:s12 starts at 00:04.662]

      H1:   WINDOW—————

      H2:                IX

      'The window'

At the clause level, the verb (being the head of the clause) can spread across its arguments and adjuncts – as in (6) where the verb FLEE spreads across the adjunct IX-UP – but also the nominal sign serving as the subject,[12] the object or a sign serving as adverb can spread across the verb, as in (7) where the nominal sign MONKEY in subject position spreads across the verb DESIRE. Unlike spreading within noun phrases, spreading of dependents across the head at the clause-level is quite common.

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**12** A subject, an object etc. can be a noun phrase containing multiple signs. In such cases it is the head of the noun phrase (the nominal sign) that would be held and spread across the verb at the clause level.

(6)    [CNGT0092 S002 starts at 00:21.800]
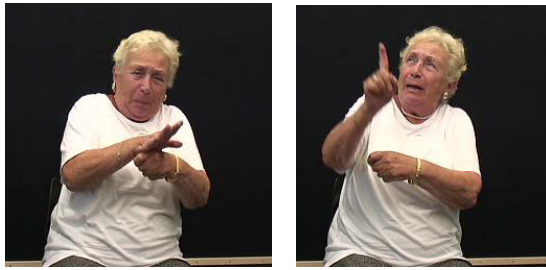


H1:    IX FRIEND    FLEE                IX-UP

H2:       FRIEND    FLEE———————————————————

'The friend runs away up there.'

(7)    [RSL:cr4:s18 starts at 00:25.736]



H1:    MONKEY                      DESIRE

H2:    MONKEY——————————————————————

'The monkey wants it very much.'

Again, it is possible to show that the lexical source of the hold can have various properties. The held sign can be two-handed (as in the examples above), or one-handed (8). This example also shows that for instance a subject held across the whole sentence can be a pointing sign, while it can also be a fully lexical sign as in (7). Example (6) demonstrated that the held verb can be a lexical verb; example (9) demonstrates that it can be a classifier construction as well.

(8)    [CNGT0094 S001 starts at 01:58.133]

    H1:    IX-1————————

    H2:         DEAF

     'I'm deaf.'

(9)    [CNGT0024 S003 starts at 00:37.895]

    H1:    CL:OPEN.WINDOW       OLD

    H2:    CL:OPEN.WINDOW————————

     'The old woman opens the window.'

Furthermore, sometimes a verb spreads across one or more verbs following it. In many cases, it is possible to say that we observe a serial-verb construction (Aikhenvald 2006), so the verbs belong to one clause and refer

to one complex action. In (10) the verb LOOK.IN.TELESCOPE spreads across the following semantically related verb LOOK. In (10) the held sign is a classifier construction, but (11) also shows that a lexical sign can be held.

(10)  [CNGT1712 S071 starts at 00:15.285]



H1:  CL:LOOK.IN.TELESCOPE                LOOK

H2:  CL:LOOK.IN.TELESCOPE――――――――――――――――――

'He looks through the telescope.'

(11)  [RSL:cr2:s16 starts at 00:04.500]

H1:  PLAN          THINK

H2:  PLAN――――――――――

'He plans.'

We also found other examples that can be subsumed under syntactic holds, namely the spreading of a wh-word across the whole sentence, and spreading of a preposition (such as TOGETHER in RSL) across its dependent. However, holds in these contexts were not frequent in our sample.

Nespor and Sandler (1999) looking at similar holds in a different sign language (Israeli Sign Language, ISL) argued that at least some holds in ISL do not appear to have a function, but only serve to make visible the rhythmic structure of sentences. In particular, they suggest that holds may mark the level of phonological phrases in the prosodic hierarchy. For instance, in (12) the verb BAKE and the subject IX-1 constitute one phonological phrase and this is also the domain of the weak hand hold.

(12)  [ISL]

H1:  IX-1 BAKE

H2:  ―――BAKE

'I bake' (adapted from Nespor and Sandler 1999:163).

Note, however, that the domain of spreading in (12) can be also described in syntactic terms: the verbal predicate is held across the whole clause. In our own two data sets, we have not been able to find holds that only relate to rhythmic units, and thus are generated by the prosodic level of phonology. Rather, all holds seem to fulfil one of the four functions outlined in this paper. Their phonological appearance is likely to often align with prosodic domains, much as in the examples in Nespor and Sandler (1999).

For the moment, we conclude that the RSL and NGT data on weak hand holds are compatible with the hypothesis that intra-clausal holds can be used to mark syntactic constituents (noun phrases, VPs, clauses). However, we do not exclude the possibility that further research will show that at least some of the holds analysed here as syntactic are better accounted for in prosodic terms.[13]

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**13**  In particular, if by analysing larger datasets, a systematic pattern is found where a prosodic unit (e.g. a phonological phrase) is not aligned with a syntactic unit (e.g. an NP or a VP), and the weak hand hold aligns with the prosodic but not syntactic boundaries, this could serve as evidence for a prosodic analysis of the holds discussed in this subsection. An opposite pattern (alignment of weak hand holds with syntactic units which are not isomorphic to prosodic ones) would be an argument in favor of a syntactic analysis.

Note that the function (unlike the form) of syntactic holds is not unique to the visual modality. According to some theories (Seidl 2001; Elordieta 2008), intonation in spoken languages is also used to mark boundaries of syntactic units. Other markers of syntactic units in spoken languages include complementisers, wh-words and question particles that often mark sentence boundaries. Smaller units can also be marked by bracketing constructions, that is, doubling (see Kimmelman 2014: ch. 5 for a discussion).

## 3.3 Iconic semantic functions

We also found holds whose contribution is primarily semantic: they express a particular meaning. As we will show in this section, these holds can also be characterised as being iconic, as they iconically represent spatial or temporal relations. The fact that these holds are iconic is of course due to the affordances of the visual modality. However, the meanings expressed by these holds are in no way unique to sign languages.[14] Moreover, one might expect to find other non-iconic semantic holds in future research.

Holds with iconic semantic functions appear both in intra-clausal and inter-clausal contexts. In the intra-clausal cases, there does not appear to be a supplementary syntactic function for the hold, and for that reason we classify it as 'semantic'. Note that it is of course possible in principle to describe these holds in syntactic terms in particular frameworks (see Kimmelman 2015 for one such analysis). However, descriptively these holds are semantic. We have so far identified two types of semantic functions, each iconic in nature: *background in a locative construction* and *simultaneity* (cf. Sáfár and Kimmelman 2015).

### 3.3.1 Background in a locative construction

Probably the clearest instance of an iconic semantic function is what we call *background in a locative construction*. In this type of hold, the weak hand represents an entity that is located in space, forming the background. While the weak hand is held, the other hand signs the figure and/or the locative relation between the two referents. For instance, in (13a), the grandmother is located with respect to the open window, which is expressed through the hold of the verb WINDOW.OPEN. In (13b), the location of the cat getting into the pipe is described with the help of holding the sign PIPE. In such cases, the backgrounding function of the weak hand takes effect because a topographic relation is created between the two hands which in turn is interpreted as the locative relation between the referents that the two hands represent.

(13a)          [RSL:cr5:s20 starts at 00:32.962]
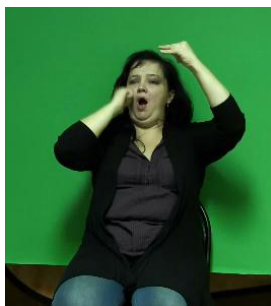


| H1: | CL:WINDOW.OPEN | GRANNY | IX |
|---|---|---|---|
| H2: | CL:WINDOW.OPEN————————————————————————————— | | |

'The window opens. The granny is there.'

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**14** Although it is true that in general any meaning can be expressed in any language, it is not true that all languages express the same meanings by regular constructions or words/signs (that is, by lexical or grammatical means), and it is not unimaginable that sign languages might grammaticalise some meanings that spoken languages do not.

b.          [CNGT1774 S074 starts at 00:15.535]
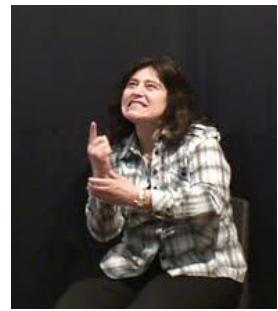
H1:          IX                          CL:GET.IN                     CL:CLIMB.UP

H2:          PIPE————————————————————————————————————————————

'He climbs into the pipe'

Again, as with the previous categories, there are different signs that can be the source of such a hold. (13a) illustrates a two-handed sign, but a one-handed sign can be held as well, as illustrated in (14) and (15). In (13a) the held sign is a part of a classifier construction; in (14) the lexical sign WINDOW is held, while in (15) the pointing sign ix fulfils the function of the background in a locative construction, referring to a place mentioned previously.

(14)    [RSL:cr1:s10 starts at 00:14.341]

H1:                    CL:HEAD.STICK.OUT

H2:    WINDOW————————————————

'A head appears in the window.'

(15)    [RSL:s1:s10 starts at 03:41.857]

H1:    IX—————————

H2:         NEARBY

'Near that place...'

### 3.3.2 Simultaneity

Another category related to iconicity is that of *simultaneity*. We used this category to describe cases where (typically) a verb that is usually combined with role shift is held, while the strong hand goes on and signs the next sentence. The verb on the weak hand does not stand in a structural relationship to the following sentence. Rather, what links the hold to the signs articulated by the other hands is the simultaneity of events that are described.[15] In (16), the cat offers the banana and simultaneously calls the monkey; the verb OFFER is held across the following verb CALL. The simultaneity of two events is thus expressed in an iconic manner by the (partially) simultaneous articulations of the two hands. It is the presence of the hold itself that is responsible for the meaning of simultaneity of actions. If the hold were not there, the actions could

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**15** In addition, as suggested by an anonymous reviewer, a locative relation between the hands might also be expressed. Thus it might be the case that this and similar examples combine both semantic iconic functions.

still have been interpreted as occurring simultaneously, but this meaning would not have been expressed by linguistic means and would have to be inferred by the interlocutor.[16]

(16)         [CNGT1715 S072 starts at 00:23.130]



H1:        BANANA                        CL:OFFER−−−−−

H2:                                              CALL

        'He offers the banana and calls [the monkey].'

It is worth noting that, in our data, holds expressing the meaning of simultaneity almost always occur in the context of role shift. The first sentence that introduces the sign that will be held consecutively usually contains a role shift that also spreads across the second sentence. For instance, in example (16), the signer takes the role of the cat while signing CL:OFFER, and the shift continues in the next sentence CALL.

    If we look at the properties of the held signs, they can be different as in the previous cases. In (16) the held sign CL:OFFER is one-handed, but in (17) the held sign CL:LOOK.IN.BINOCULARS is two-handed. In both (16) and (17) the held signs are classifier constructions, but in (18) the lexical verb PLAN is held to express simultaneity.

(17)    [RSL:cr1:s16 starts at 00:04.160]

    H1:    CL:LOOK.IN.BINOCULARS    SEE BIRD SEE

    H2:    CL:LOOK.IN.BINOCULARS−−−−−−−−−−−−

        'He looks in the binoculars and through them sees a bird.'


(18)    [RSL:cr4:s16 starts at 00:04.190]

    H1:    PLAN    CL:WALK.IN.CIRCLES

    H2:    PLAN−−−−−−−−−−−−−−−−−−

        'He plans while walking in circles.'


## 3.4 Discourse-related functions

We identified four functions of holds that are discourse-related, namely *verb as sentence topic*, *noun as topic*, *anchoring a referent,* and *parenthesis.* However, they occur in different contexts: while *anchoring a referent* is mostly clause-internal, the other ones are clause-external. In the verb as sentence topic case,

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**16** An anonymous reviewer suggested that even when there is no hold, simultaneity of events might be linguistically expressed, for instance by marking one of the event descriptions with parenthetical non-manuals. Although such non-manuals would indeed give a clue to the addressee that the event marked this way is in some sense subordinate to the other event, simultaneity would not be directly expressed, as there are other relations that could be expressed this way, such as a causal relation. For instance, (16) without a hold but with some parenthetical marking on call might be interpreted as 'He offers the banana in order to attract the monkey.'

two clauses following each other are in some logical relation; this can be specified by saying that the first clause as a whole is the topic of the following clause. In this case, the verb over 'to finish, to stop' can spread across (a part of) the following clause IX FINALLY MAY GO.OUT (19). The function of this hold is to show that the clauses are semantically related to each other, namely that he (the son) was finally allowed to go out *because* his illness was over.[17]

(19)     [CNGT0170 S010 starts at 04:34.840]



|  | OVER | OVER+FINALLY | OVER+GO.OUT |
|---|---|---|---|
| H1: | NOW IX | OVER. | IX FINALLY MAY GO.OUT |
| H2: |  | OVER———————————————————————————————— |  |

'Now it was over. So he finally was allowed to go out.'

In (19) the held sign is a lexical sign, and it is two-handed. Interestingly, we do not find one-handed signs in this function, which might be due to the low number of examples of this category in our corpus. Classifier constructions can occur as hold as well in this category, as (20) shows. Note that (20) is an instance of the so-called wh-cleft construction (Wilbur 1996, see also Caponigro and Davidson 2011 for a different analysis of this type of construction), where the first clause is often analysed as being topical, and the second clause as being focal, that is, commenting on the first clause.

(20)     [RSL:cr8:s19 starts at 00:33.854]

    H1:   IX CL:DRIVE      WHO GRANNY  BIRD

    H2:   IX CL:DRIVE————————————BIRD

        'Who drives the tram? The granny and the bird.'

Brentari and Crossley (2002) discuss similar types of holds in ASL and claim that they represent the phenomenon of Forward-Referencing. In spoken languages there are intonational means to show that two Intonational Phrases are semantically related to each other, and Brentari and Crossley argue that the weak hand hold in this case is a similar process. Therefore, the function of the hold is not modality-specific, but the form is.

Another hold type that crosses clause boundaries is *noun as topic,* which means that a noun prominent for some stretch of discourse (i.e. a discourse topic) is held across several clauses. One should also note that most often the noun is actually realised as a pronoun, which is to be expected because nominal topics are often pronominalised. Example (21) shows that the pronoun IX can have different syntactic functions in different sentences: it can be subject or object, but in all clauses following the first, it is the topic of the clause. The function of such holds is to mark a discourse topic: although any part of discourse potentially

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**17** The + character is used to gloss simultaneous signs in one line notation so that OVER+FINALLY means that these two signs are realised simultaneously.

contains a discourse topic, or theme, it does not have to be marked. As with the case of iconic simultaneity above, the hold serves the purpose of making visible what would otherwise need to be inferred.

In (21) the sign held is one-handed, and it is a pointing sign. This is the most typical situation, as topical referents are usually referred to by pointing signs. However, lexical nouns can be held in this function as well, as in (22). Two-handed signs can of course fulfil this function, too.

(21)        [RSL:cr4:s10 starts at 01:03.111]



| MONKEY+IX | LOOK+IX | NICE+IX |

H1:     THINK     MONKEY. LOOK. NICE.

H2:        IX––––––––––––––––––––

        'She thinks it is a monkey. She looks at it. It is nice!'

(22)        [RSL:cr4:s18 starts at 00:36.680]

        H1:                              FINE

        H2:     THINK MONKEY–––––

        'She thinks it's a monkey. It's fine.'

Although the form of *noun as topic* marking in sign languages is of course modality-specific, the function of marking a discourse topic is by no means so. All languages employ a variety of strategies to show topic continuity. The fact that the topic of this sentence is the same as the topic of the previous one is often expressed by choosing a smaller expression (pro-drop if possible, or a pronoun in contrast to a full NP) (Givón 1983). Some languages also have the grammaticalized device known as switch reference that is used to signal change in subjects between clauses, but which according to Givon (1983) is also employed to mark topic (dis)continuity.

It is possible that the first two types of discourse-related holds in fact represent one phenomenon – holds expressing a topic-comment relationship.[18] In the case of noun as topic, it is the noun phrase which is topical, while in case of verb as topic, it is the whole clause. In both cases, the head constituent (respectively the noun and the verb) of the topic is held. A potential difference might be that nouns are often held across several clauses, thus representing discourse topics, while clausal topics are usually sentence-level topics in the sense that one clause is a topic of another (single) clause within one sentence. However, a larger dataset might contain examples of the latter type of hold spreading across several clauses. If this is the case, these types of discourse holds should be collapsed.

The third type of discourse-related holds (anchoring a referent) usually does not cross clause boundaries. Formally speaking, it can be analysed as a syntactic hold. However, unlike most syntactic holds it appears to also have a discourse function, and this function is different from just assigning a location to a referent. Sometimes when a referent is mentioned for the first time, a pointing sign is used to anchor this referent in discourse and it is often held while the other hand signs the noun and its dependents. In (23) the referent BIRD

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**18** We thank an anonymous reviewer for this suggestion.

is actually articulated simultaneously with the pointing sign that anchors it, and this pointing sign is held while the other hand signs another IX and a fingerspelled sequence further identifying the referent.

(23)    [RSL:cr1:s10 starts at 00:23.772]



BIRD+IX                    IX+IX                    IX+K-A-N-A-R-E-Y-K-A

H1:    APPEAR    CANARY IX K-A-N-A-R-E-Y-K-A

H2:                 IX————————————————

   'There appears a canary.'

It might seem that the function of the pointing sign is to establish a locus for a new referent. However, a pointing sign without a hold could fulfil the same function as well. In addition, in (23) the pointing sign which is held points to a location different from the other pointing sign in the sentence. The canary which is described in this example is actually located above the signer, so the non-held pointing sign is the one which establishes the locus. Therefore, the function of the held pointing sign is better described as marking an important referent in discourse, and this is why, in the end, we treat this type of hold separately from syntactic holds of pointing signs within a noun phrase.

   Interestingly, Johnston (2013) also describes a similar type of holds in Australian Sign Language, and argues that the held pointing sign is a determiner, which in his definition means that the noun phrase refers to a known previously introduced referent. It thus appears that the function of such holds in Auslan vs. RSL and NGT is different.

   Unlike most other holds, this type of hold is restricted by definition: only pointing signs are held, and therefore the source sign is also always one-handed.

   In addition, sometimes holds occur due to discourse-regulating mechanisms, namely *parenthesis* or *repair*. For instance, in (24) the signer reacts, on the active hand, to the question of the addressee that was asked simultaneously with PORTRAIT THIRD, holding the last sign from the main storyline THIRD on the weak hand and signing the answer to the question N-A-T-U-R-M-O-R-T with the active hand.
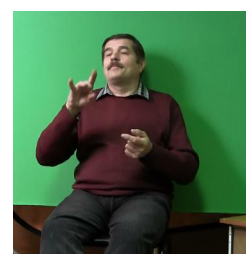
(24)    [RSL:s3:s18 starts at 00:24.809]



H1:    PORTRAIT            THIRD            N-A-T-U-R-M-O-R-T ('still.life')

H2:    PORTRAIT            THIRD—————————————————————————————

   'Thirdly, [I can draw] portraits. Still lifes [I said before].'

Due to the small number of such cases, we only have holds originating in lexical two-handed signs, similar to (24) above; however, there seems to be no particular reason why one-handed signs and classifiers would be excluded from such a construction.

# 4  Discussion

In the previous section we outlined our analysis of different functions of holds in RSL and NGT, based on semi-spontaneous signing taken from larger corpora. The most important consequence of our analysis is that it is not possible to analyse holds in terms of fixed form-function units, similar to Liddell's (2003) buoys. We discuss this issue further in section 4.1. In addition, the striking similarity in the functions of holds in RSL and NGT is briefly addressed in section 4.2.

## 4.1  Form and function relations

It has been argued previously (Liddell 2003) that some weak hand holds are actually fixed form-function units called buoys. For instance, pointer buoys and list buoys were proposed by Liddell (2003), and a new category called point buoys was proposed by Vogt-Svendsen and Bergman (2007). In each case, a sign or type of sign is related to a particular discourse function. Our analysis of RSL and NGT holds shows that the categories of buoys might be too strictly defined. Moreover, since the types of holds can be described in traditional linguistic terms, the modality-specific notion of buoy becomes less attractive.

The pointer buoy, according to Liddell, is a pointing sign held on the weak hand to refer to the discourse topic. The point buoy is also a pointing sign but used to refer not to a referent but to a point in space or time with respect to which some other elements are located. However, we have seen that pointing signs can be held with many different functions: they can be subjects or objects spreading across the verb, they can represent a discourse topic, and they can be used to anchor a new referent. Furthermore, the point buoy, in our view, is actually an instantiation of the more general function of background in locative construction. Thus, the holds involving pointing signs can have different functions, but these functions are not unique to pointing – nouns can be held in the same functions as well (see Figure 3). The only exception is pointing to anchor a referent – this function appears indeed to be unique to pointing holds. Therefore we have to conclude that the term "pointer buoys" and "point buoys" are notions created by conflating the form and function of holds.
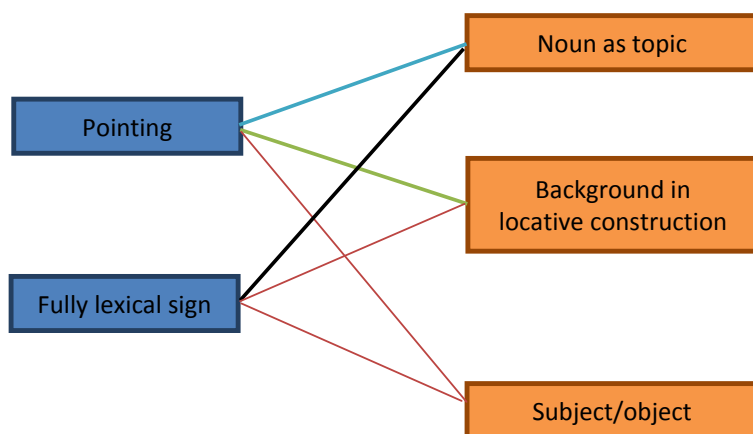


**Figure 3** Relation between forms and functions of holds in RSL and NGT. The blue line represents a pointer buoy in Liddell's terminology; the green line represents a point buoy; the black line would be characterised as a fragment buoy; the other lines are not accounted for in terms of buoys.

The limited explanatory power of the various types of buoys is even more obvious in the case of the so-called "fragment buoys" which is a cover term for all the different types of non-pointing holds that we have discussed. It is obvious that different "fragments" have different functions and therefore they should not be analysed as one category.

Our proposal seems to be closer to Miller's (2000), who classified holds according to their functions. However, there are some differences. For instance, he suggests the following two categories: holds of nouns used to encode topical elements and holds of pronouns and determiners to encode syntactic relationship (between a subject and a predicate or a determiner and a noun). Again we think that these particular mappings of form and function are misguided as they blur important distinctions between different functions that a hold of a particular form (i.e. a pointing sign) can have.[19] In our data, topical elements can be nominal and pronominal (and maybe even clausal), and subjects and objects can be nominal and pronominal as well.

Finally, we need to mention that sometimes a hold can have more than one function or combine functions and other motivations. First, sometimes a hold that occurs in a doubling context (which we classified as a mechanistic hold above) can have some function, such as the head of a noun phrase, or background in locative construction (recall example (2) where the hold can be caused by doubling but also has a function of the noun phrase head spreading across its dependent). Furthermore, noun as topic can be characterised as a hold of a subject or an object inside each of the relevant clauses (see example (21)).

In Table 4, we summarise the functions of weak hand holds in RSL and NGT, and the forms of the holds. Remember that in Liddell's analysis there should be a clear difference between different forms with respect to the functions they can fulfil as holds. The table makes it clear that the buoy labels proposed by Liddell cannot capture the variety of functions that the holds have. The fact that some of the functions are associated with one formal type of signs is usually explained by factors unrelated to holds, as discussed above for noun phrase heads and anchoring a referent.

**Table 4** Forms and functions of holds in RSL and NGT

| Domain | Function | Form |
|---|---|---|
| Syntactic | object | pointing, lexical sign |
| | subject | pointing, lexical sign |
| | verb/predicate | lexical sign, classifier |
| | serial-verb construction | lexical sign, classifier |
| | noun phrase head | lexical sign |
| | adjective (noun phrase modifier) | lexical sign |
| | adverb (clause modifier) | lexical sign |
| | wh-word | lexical sign |
| | preposition | lexical sign |
| Discourse | anchoring a referent | pointing |
| | noun as topic | pointing, lexical sign |
| | verb as sentence topic | lexical sign, classifier |
| | parenthesis, repair | (pointing), lexical sign, (classifier) |
| Iconic | simultaneity | lexical sign, classifier |
| | background in locative construction | pointing, lexical sign, classifier |

There are some other functions that we do not describe here because of the scarcity of data in our corpora. Firstly, both RSL and NGT have holds which can be called list buoys (see Liddell 2003, Pinsonneault and Lelièvre 1994 for some discussion of this type of holds in other sign languages), but the corpora analysed provide us with only a few examples. We hypothesise that list buoys, too, have different functions, including

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**19**  As an anonymous reviewer pointed out, Miller did not explicitly claim his categories to be mutually exclusive, so the difference between our approach and his might be limited to the fact that we clearly demonstrate that signs of the same type (e.g. pointing signs, lexical signs) can have different functions, while he focused on some examples where a particular type of the sign was associated with a particular function.

syntactic ones (representing a subject, an object or an NP head), discourse functions (representing thematic referents), and also a function not mentioned in the table, namely expressing conjunction and disjunction (Davidson 2012). Further research is needed to test this hypothesis. Secondly, the hold of the palm-up sign can likewise have many functions as well that are not discussed in this paper. It has been convincingly argued that palm-up is a multifunctional sign (e.g. McKee and Wallingford 2011 on New Zealand Sign Language), so holds involving this sign are likely to have many different functions as well. Analysing these signs and their functions falls out of the scope of this paper.

Since the RSL and NGT data cast doubt on the different types of buoys, this also leads us to question the necessity of the notion itself. We have demonstrated that holds can be described in traditional linguistic terms, so a modality-specific notion that presupposes the fixed relation between the form and the function of the hold is less attractive. The notion of buoy itself is a useful metaphor that describes the connection between the form (holding an articulator as a part of a sign in the visual field of the addressee) and the meaning (preservation of a referent in the discourse space); however, we showed that this metaphor applies to only some types of holds (mostly discourse and iconic ones[20]).

## 4.2  Comparison of RSL and NGT

One of the important findings of this research is that the same types of holds can be found in RSL and NGT. This finding is striking and thus of importance, because RSL and NGT are not related to each other and have not been in intensive contact with each other at any time. Although the functions of the holds in RSL and NGT are the same, the overall frequency of holds in RSL is significantly higher than in NGT in our sample. This fact and some possible explanations for it are discussed in Sáfár and Kimmelman (2015) in detail.

As for the similarities in functions between RSL and NGT, a possible explanation is related to the visual-spatial modality of sign languages and the clear modality-specific character of weak hand holds. Holds are modality-specific because they are based on the use of two partially independent articulators; cognitive and motor constraints allow for partial independence only, that is, only one of the hands can be active which results in the more passive role of the other hand which can also be instantiated as a hold. Sign languages use the affordances of the visual modality to convey linguistic meanings, and the meanings associated with holds seem to arise naturally from the formal properties of holds.

First, phonetic holds are present for articulatory reasons, the hypothesis being that they constitute a reduction of articulatory effort compared to non-hold realisations of the same string of signs. Second, holds are natural boundary-markers, as the hold visually emphasises a constituent by being temporally aligned with either the left or the right boundary of a constituent, or both. Therefore, they are used to mark syntactic constituents. Thirdly, holds are used to express semantic elements in an iconic way because they represent spatial arrangements and simultaneity in a very transparent manner: the spatial arrangement of referents is mirrored in the spatial arrangement of hands, and the simultaneity of events is mirrored in (partial) simultaneity of the produced signs. Finally, the importance of a discourse referent can be emphasised by the longer act of referring to this referent (=holding the sign), and the relation between clauses can be emphasised by an overlap between them, again realised as a hold.

In other words, with the exception of phonetic holds, all the functions of holds are non-arbitrary and motivated by the natural interpretations that can be connected to the act of holding a hand as a part of a sign. All in all, the fact that sign languages, including RSL and NGT, are similar to each other in the functions of holds is less surprising than one may initially think.

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**20**  As suggested by an anonymous reviewer, if syntactic holds are construed as boundary-markers (see next section), the metaphor could be applied to them as well. Even if this is the case, the metaphor applies to a lesser extent, as the role of the held sign is different: rather than its meaning, only the fact of holding something while producing a syntactic unit is important.

# 5 Conclusions

Using data from two unrelated sign languages, we have provided evidence for an alternative analysis to Liddell's (2003) notion of 'buoy' (formally defined as weak hand holds which have discourse-related functional properties) for holds of the non-dominant hand. In this first analysis of new data from two corpora of unrelated sign languages, it appears that some holds are mediated by syntactic or discourse structure, while others are more directly linked to semantic features of a message. In all cases, they can be analysed without the need for a new concept like 'buoy' that is unknown in the linguistics of spoken languages. In addition, the corpus data that were analysed for NGT and RSL show that in these languages, there is no straightforward mapping between the type of sign and the function of the hold in the way that Liddell and others have argued for ASL, Swedish Sign Language and Norwegian Sign Language (Liddell 2003, Liddell, Vogt-Svendsen and Bergman 2007, Vogt-Svendsen and Bergman 2007, Nilsson 2010).

The resulting analysis of the various holds is not unlike that of Miller (2000). In particular, he demonstrated the existence of holds with different functions: holds in locative constructions (similar to our holds for *background in a locative construction*); holds of verbs to encode simultaneous events (similar to our iconic semantic holds for simultaneity); holds of nouns to encode topical elements (our *noun as topic* holds), and holds of pronominals and determiners to encode a syntactic relationship (similar to some of our syntactic holds). However, there is still an important difference between our analysis and Miller's: we argued that the relation between functions and the type of sign that is being held is less strict. For instance, not only nouns can be held to encode topical elements, but also pronouns. Likewise, syntactic holds are not limited to nouns and pronouns only. In addition, we identified more different functions of holds than in Miller's analysis. Since Miller's research was the first and preliminary exploration of the functions of holds, our findings might be not entirely surprising, but they demonstrate the necessity of further cross-linguistic research on the topic.

It will be clear that this analysis raises many new questions, including how phonetic holds come about in the phonetic spell-out of syntactic structure (Crasborn and van der Kooij, in prep; Crasborn and Sáfár, in prep.). Our analysis of holds as expressing features of linguistic structure and semantics does not preclude an analysis of holds in prosodic terms. On the contrary, holds are a phonetic-phonological phenomenon above the word, and therefore are by definition prosodic in nature, as the traditional notion of prosody for spoken languages encompasses all phonological phenomena above the segment. It does remain an open question whether or not all phenomena we have encountered in the two corpora lend themselves to an analysis in terms of prosodic domains in the spirit of Nespor and Vogel (1986) and Nespor and Sandler (1999). A clearer view of the functions of holds, like the one we have outlined here, combined with a detailed study of the prosodic level may however help to establish how prosodic domains are derived from and related to syntactic domains.

Another interesting question concerns the combinations of functions and motivations that a hold can have. As we demonstrated above, holds in our data often have different functions or motivations; however, we have not conducted a systematic analysis of different possible combinations; a much larger dataset will be necessary to investigate this issue.

Finally, since our research is based on two sign languages, and we found only quantitative, but not qualitative differences between weak hand holds in them (see Sáfár and Kimmelman 2015 for a detailed discussion of the differences), it would be interesting to investigate whether the types of holds we identified are universally applicable to sign languages. On the one hand, the holds described in the collection of works in Vermeerbergen et al. (2007) easily lend themselves to an analysis in the terms proposed here. On the other hand, Nyst (2007) argued that Adamorobe Sign Language does not productively use holds. Further cross-linguistic research is thus necessary.

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