

- Stavans, Anat
 1996 One, Two, or More: The Expression of Number in Israeli Sign Language. In: *International Review of Sign Linguistics* 1, 95–114.
- Sutton-Spence, Rachel/Woll, Bencie
 1999 *The Linguistics of British Sign Language: An Introduction*. Cambridge: Cambridge University Press.
- Valli, Clayton/Lucas, Ceil
 1992 *Linguistics of American Sign Language: An Introduction*. Washington, DC: Gallaudet University Press.
- Wilbur, Ronnie
 1987 *American Sign Language: Linguistic and Applied Dimensions*. Boston: Little, Brown & Co.
- Wilbur, Ronnie
 2010 The Semantics-Phonology Interface. In: Brentari, Diane (ed.), *Sign Languages (Cambridge Language Surveys)*. Cambridge: Cambridge University Press, 357–382.
- Zeshan, Ulrike
 2000 *Sign Language in Indo-Pakistan: A Description of a Signed Language*. Amsterdam: Benjamins.
- Zwitserslood, Inge
 2003 *Classifying Hand Configurations in Nederlandse Gebarentaal*. Utrecht: LOT.
- Zwitserslood, Inge/Perniss, Pamela/Aslı Özyürek
 2011 *An Empirical Investigation of Plural Expression in Turkish Sign Language (TID): Are There Modality Effects?* Manuscript, Radboud University Nijmegen and Max Planck Institute for Psycholinguistics, Nijmegen.

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7. Verb agreement

1. Introduction
2. Background on agreement
3. Realization of agreement
4. Candidacy for agreement
5. Conclusion: agreement in sign and spoken languages
6. Literature

Abstract

This chapter compares several theoretical approaches to the phenomenon often labeled ‘verb agreement’ in sign languages. The overall picture that emerges is that cross-modally, there are both similarities and differences with respect to agreement. Sign languages seem to be similar to spoken languages in that they realize the person and number features of the arguments of the verbs through agreement, suggesting an agreement process that is

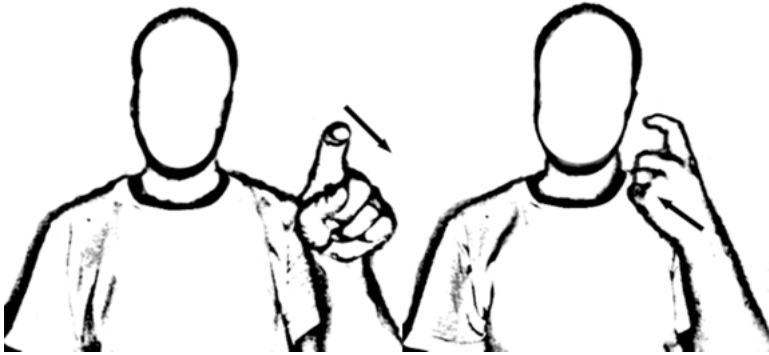


Fig. 7.1: Forms of ASK in ASL. The form on the left corresponds to 'I ask you' while the form on the right corresponds to 'you ask me'.

available to both modalities. However, there are two important cross-modal differences. First, the agreement process in sign languages is restricted to a smaller set of verbs than seen in many spoken languages. This difference may be resolved if this restriction is taken to be parallel to other restrictions that have been noted in many spoken languages. Second, the properties of agreement are more uniform across many sign languages than across spoken languages. This peculiarity can be derived from yet another cross-modal difference: certain agreement forms in sign languages require interaction with gestural space. Thus, while the cross-modal differences are rooted in the visual-manual modality of sign languages, sign and spoken languages are ultimately similar in that they both draw on the agreement process.

1. Introduction

Figure 7.1 shows two forms of the verb ASK in American Sign Language (ASL). The form on the left means 'I ask you' while the form on the right means 'you ask me'. Both forms have similar handshape (crooking index finger) and similar shape of the path of movement (straight), which constitutes the basic, lexical form for ASK. The only difference between these two forms lies in the orientation of the hand and the direction of movement: the form on the left is oriented and moves towards an area to the signer's left, while the form on the right is oriented and moves towards the signer's chest.

The phenomenon illustrated in Figure 7.1 is well documented in many sign languages, including, but not limited to, ASL (Padden 1983), Argentine Sign Language (Massone/Curiel 2004), Australian Sign Language (Johnston/Schembri 2007), Brazilian Sign Language (Quadros 1999), British Sign Language (Sutton-Spence/Woll 1999), Catalan Sign Language (Quer/Frigola 2006), German Sign Language (Rathmann 2000), Greek Sign Language (Sapountzaki 2005), Indo-Pakistani Sign Language (Zeshan 2000), Israeli Sign Language (Meir 1998), Japanese Sign Language (Fischer 1996), Korean Sign Language (Hong 2008), Sign Language of the Netherlands (Bos 1994; Zwitserlood/Van Gijn 2006), and Taiwanese Sign Language (Smith 1990).

Some researchers have considered the change in orientation and direction of movement to mark verb agreement, since the difference between the two forms corresponds

to a difference in meaning that is often marked in spoken languages by person agreement with the subject and object. However, such an analysis remains controversial and has occupied a significant portion of the field of sign linguistics.

Labeling this phenomenon as ‘verb agreement’ comes with many theoretical assumptions. In exploring these theoretical assumptions, this chapter addresses the core issue of whether this phenomenon can indeed qualify as ‘verb agreement’ by taking a particular angle: whether the phenomenon can be explained as the morphological realization of verb agreement in sign languages.

For the purpose of this chapter, the following working definition of agreement is adopted from Steele (1978): “The term *agreement* commonly refers to some systematic covariance between a semantic or formal property of one element and a formal property of another.” Corbett (2006) expands on this definition by specifying that there are four main components to the systematic covariance, as listed in (1).

- (1) Main components of agreement (Corbett 2006, 1)
 - (i) controller (an element which determines agreement)
 - (ii) target (an element whose form is determined by agreement)
 - (iii) domain (the syntactic environment within which agreement occurs)
 - (iv) features (the properties that the controller agrees with the target in)

To examine whether the phenomenon in sign languages can be analyzed as verb agreement, the chapter first provides a brief background on the phenomenon depicted in Figure 7.1. Then, the following section discusses whether this phenomenon can be analyzed as the morphological realization of person and number features and compares several theoretical approaches to this issue. Next, on the assumption that the phenomenon is indeed the realization of person and number features, the chapter considers cases when the features are not completely realized and focuses on the issue of determining which verbs realize these features. Again, this section takes into account the latest theoretical analyses of this issue. The phenomenon is ultimately used as a case study to identify linguistic properties that are common to both spoken and sign languages and to understand the effects of language modality on these properties.

2. Background on agreement

This section provides a brief background on verb agreement in sign languages for those unfamiliar with the phenomenon. There are many detailed descriptions of the phenomenon available (see, for example, Lillo-Martin/Meier (2011) and Mathur/Rathmann (2010) for a comprehensive description). Due to space, the description is necessarily condensed here.

First, not all verbs undergo a change in orientation and/or direction of movement to show a corresponding change in meaning. As Padden (1983) observes for ASL, there are three classes of verbs which she labels ‘plain verbs’, ‘agreeing verbs’, and ‘spatial verbs’, respectively. The above example of ASK falls into the class of agreeing verbs, which undergo the above-described phonological changes to reflect a change in meaning (specifically, who is doing the action to whom). Spatial verbs, like, for exam-

ple, MOVE, PUT, and DRIVE, change the path of movement to show the endpoints of the motion (e.g. *I moved the piece of paper from here to there*). Plain verbs may be inflected for aspect, but otherwise cannot be changed in the same way as agreeing and spatial verbs. Two ASL examples are COOK and BUY. The same tri-partite classification of verbs has been confirmed in many other documented sign languages.

Within the class of ‘agreeing verbs’, verbs manifest the phenomenon shown in Figure 7.1 in different ways depending on their phonological shape. Some verbs like TELL mark only the indirect/direct object (called ‘single agreement’), while others like GIVE mark both the subject and indirect/direct object (called ‘double agreement’) (Meier 1982). Some verbs mark the subject and indirect/direct object by changing the orientation of the hands only (e.g. PITY in ASL), while others show the change in meaning by changing only the direction of movement (e.g. HELP in ASL), and yet others show the change through both orientation and direction of movement (e.g. ASK shown in Figure 7.1) (Mathur 2000; Mathur/Rathmann 2006). The various ways of manifesting the phenomenon in Figure 7.1 have sometimes been subsumed under the term ‘directionality’.

In addition to marking the changes in meaning through a change in the orientation and/or direction of movement (i.e. through manual changes), other researchers have claimed that it can also be marked non-manually through a change in eye gaze and head tilt co-occurring with the verb phrase (Aarons et al. 1992; Bahan 1996; Neidle et al. 2000). They claim in particular that eye gaze and head tilt mark object and subject agreement respectively, while noting that these non-manual forms of agreement are optional. Thompson, Emmorey, and Kluender (2006) sought to evaluate the claims made by Neidle et al. (2000) by conducting an eye-tracking study. They found that eye gaze was directed toward the area associated with the object referent for 74 % of agreeing verbs and for 11 % of plain verbs. Since eye gaze did not consistently co-occur with plain verbs as predicted by Neidle et al. (2000), Thompson et al. were led to conclude that eye gaze does not obligatorily mark object agreement.

3. Realization of agreement

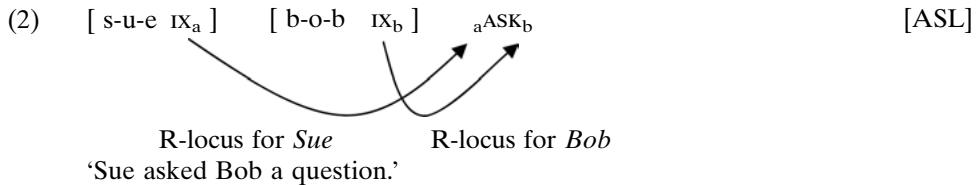
One foundational issue concerning the phenomenon illustrated in Figure 7.1 is whether it can be understood as the realization of verb agreement, and if so, what are the relevant features in the realization. There have been three general approaches to this issue: the R-locus analysis (as articulated by Lillo-Martin/Klima 1990), the indicating analysis (Liddell 2003), and the featural analysis (Padden 1983; Rathmann/Mathur 2008). For each approach, the section considers how the approach understands the mechanics behind the realization of agreement (e.g. if it is considered ‘agreement’, which elements agree with which elements in what features). The issue of how the phenomenon interacts with signing space is also discussed, as well as the implications of this interaction for cross-linguistic uniformity.

3.1. R-locus analysis

The R-locus analysis was originally inspired by Lacy (1974). It was further articulated by Lillo-Martin and Klima (1990) in the case of pronouns, applied by Meir (1998, 2002)

and Aronoff, Sandler, and Meir (2005) to the phenomenon under discussion, and further elaborated on by Lillo-Martin and Meier (2011). In this analysis, each noun phrase is associated with an abstract referential index. The index is a variable in the linguistic system which receives its value from discourse and functions to keep the referent of the noun phrase distinct from referents of other noun phrases. The index is realized in the form of a locus, a point in signing space that is associated with the referent of the noun phrase. This locus is referred to as a ‘referential locus’ or R-locus for short. There are theoretically an infinite number of R-loci in signing space. By separating the referential index, an abstract variable, from the R-locus, the analysis avoids the listability issue, that is, it avoids the issue of listing each R-locus as a potential form in the lexicon. For further discussion of the distinction between the referential index and the R-locus, see Sandler and Lillo-Martin (2006) and Lillo-Martin and Meier (2011).

Following Meir (1998, 2002), Aronoff, Meir, and Sandler (2005) have extended the R-locus analysis to the phenomenon in Israeli Sign Language (Israeli SL) and ASL and compare it to literal alliterative agreement in spoken languages like Bainouk, a Niger-Congo language, and Arapesh, a language spoken in Papua New Guinea. The mechanics of alliterative agreement is one of a copying mechanism. As an example, an initial consonant-vowel syllable of the noun phrase is copied onto an adjective or a verb as an expression of agreement. Similarly, in Israeli SL and ASL, the R-loci of the noun phrases are copied onto the verb as an expression of agreement. The ASL example constructed below illustrates how the copying mechanism works.



Under this analysis, the phenomenon is understood as ‘agreement’ between a noun phrase and a verb in the sense that they share a referential index, which is realized overtly as an R-locus. At the same time, Aronoff, Meir, and Sandler (2005, 321) concede one difference from literal alliterative agreement in spoken languages: the R-loci that (the referents of) nouns are associated with “are not part of their phonological representations and are not lexical properties of the nouns in any way. Rather, they are assigned to nouns anew in every discourse.”

While Aronoff et al. (2005) do not explicitly relate the mechanism to the realization of person and number features, the analysis is compatible with the use of such features if the features are assumed to be encoded as part of the referential index. One question is how the analysis would handle the realization of the number feature if it has a plural value (for plural see also chapter 6). The plural feature can be realized in many sign languages in two ways: (i) reduplication along an arc (called the ‘exhaustive’ form by Klima/Bellugi (1979)), which results in a distributive meaning, and (ii) movement along an arc without reduplication (labeled as the ‘multiple’ form by Klima/Bellugi), which results in a collective meaning. For the first type of realization, the analysis would need to posit separate R-loci for each of the referents associated with the plural noun phrase, while for the second type of realization, the entities referred to by the noun phrase would be associated as a group with a single R-locus.

Cormier, Wechsler, and Meier (1998) use the theoretical framework of Head-driven Phrase Structure Grammar (HPSG, Pollard/Sag 1994), a lexical-based approach, to provide an explicit analysis of agreement as index-sharing. In this framework, the noun phrase (NP) has a lexical entry which specifies the value of its index. The index is defined with respect to the locus (a location in signing space), and the locus can be one of three: the location directly in front of the signer's chest (*S*), the location associated with the addressee (*A*), or 'other'. This last category is further divided into distinct locations in neutral space that are labeled as *i*, *j*, *k*, and so forth. Thus, they view the locus as a phi-feature in ASL, which is a value of the index. The listability issue is resolved if it is assumed that the index allows an infinite number of values. The possible values for the index are summarized in (3).

- (3) Index values in sign languages in HPSG framework (Cormier et al. 1998)
index: [LOCUS *locus*]
 Partition of *locus*: *S*, *A*, *other*
 Partition of *other*: *i*, *j*, *k*, ...

According to Cormier, Wechsler, and Meier (1998), a verb has a lexical entry that is sorted according to single or double agreement and that includes specifications for phonology (PHON) and syntax and semantics (SYNSEM). The SYNSEM component contains the verb's argument structure (ARG-ST) and co-indexes the noun phrases with their respective semantic roles in CONTENT. For example, the verb SEE has an argument structure of <NP₁, NP₂> and the content of [SEER₁ and SEEN₂]. NP₁ is co-indexed with SEER, and NP₂ with SEEN by virtue of the underlined indexes. This lexical entry is then expanded by a declaration specific to the verb's sort (single- or double-agreement), which specifies the phonological form according to the values of the loci associated with the noun phrases in the argument structure (see Hahm (2006) for a more recent discussion of person and number features within the HPSG framework and Steinbach (2011) for a recent HPSG analysis of sign language agreement).

Neidle et al. (2000) have similarly suggested that phi-features are the relevant features for agreement, and that phi-features are realized by such loci. They envision agreement as a feature-checking process as opposed to an index-copying or -sharing process in the sense of Aronoff, Meir, and Sandler (2005) or Cormier, Wechsler, and Meier (1998). McBurney (2002) describes the phenomenon for pronouns in a similar way, although she reaches a different conclusion regarding the status of the phenomenon (see chapter 11 for discussion of pronouns).

A more recent perspective on the R-locus analysis comes from Lillo Martin and Meier (2011, 122), who argue "that directionality is a grammatical phenomenon for person marking" and refer to "index-sharing analyses of it. The index which is shared by the verb and its argument is realized through a kind of pointing to locations which are determined on the surface by connection to para-linguistic gesture."

3.2. Indicating analysis

Liddell (1990, 1995, 2000, 2003) challenges the R-locus analysis, arguing that verbs which display the phenomenon illustrated in Figure 7.1 are best understood as being

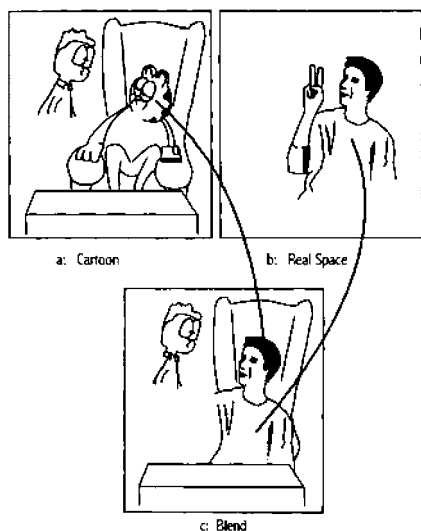


Fig. 7.2: Liddell and Metzger's (1998, 669) illustration of the mappings between three mental spaces (cartoon space, Real space, and grounded blend). Copyright © 1998 by Elsevier. Reprinted with permission.

directed to entities in mental spaces. Since these entities do not belong to the linguistic system proper, Liddell does not consider the phenomenon to be an instance of verb agreement. Rather, he calls such verbs 'indicating verbs', because the verbs 'indicate' or point to referents just as one might gesture toward an item when saying "I would like to buy *this*". Other sign language researchers such as Johnston and Schembri (2007) have adopted Liddell's analysis in their treatment of similar phenomena in Australian Sign Language (Auslan).

Two key points have inspired Liddell to develop the 'indicating analysis'. First, it is not possible to list an infinite number of loci as agreement morphemes in the lexicon. Second, an ASL sign like 'GIVE-to-tall person' is directed higher in the signing space, while 'GIVE-to-child' is directed lower, as first noted by Fischer and Gough (1978).

The indicating analysis draws on mental space theory (Fauconnier 1985, 1997) to generate connections between linguistic elements and mental entities. To illustrate the mechanics of the indicating analysis, an example provided by Liddell and Metzger (1998, 669) is given in Figure 7.2 and is reviewed here. Three mental spaces are required to account for one instance of LOOK-AT in ASL: a 'cartoon space' where the interaction between the seated cat Garfield and his owner takes place; a Real space containing mental representations of oneself and other entities in the immediate physical environment; and a grounded blend, which blends elements of the two spaces. In this blended space, the 'owner' and 'Garfield' are mapped respectively from the 'owner' and 'Garfield' in the cartoon space. From Real space, the 'signer' is mapped onto 'Garfield' in the blended space.

Liddell (2003) assumes that verbs are lexically marked for whether they indicate a single entity corresponding to the object (notated as $\text{VERB}^{\rightarrow y}$) or two entities corresponding to the subject and the object, respectively (notated as $\text{VERB}^{x \rightarrow y}$). He pro-

poses a similar notation for other forms involving plurality, as well as for spatial verbs ($\text{VERB} \rightarrow^L$, where L stands for location). Similarly, constraints on the process of agreement, such as the restriction of the multiple form to the object, would have to be encoded in the lexicon. The indicating analysis could account for the uniformity of the properties surrounding the phenomenon across various sign languages by tying the phenomenon to the act of gesturing toward entities, which is universally available to every signer.

The indicating analysis does not assume a morphemic analysis of the phenomenon in Figure 7.1 in terms of person and number features, yet lexicalizes them on some verb entries, e.g. those involving plurality. If a large number of verbs display such forms, the indicating analysis would need to explain why it is necessary to lexicalize the forms rather than treating the realization of the plural feature as a morphological process.

3.3. Featural analysis

Rathmann and Mathur (2002, 2008) provide another kind of analysis that is somewhat a hybrid of the R-locus and indicating analyses. In a sense, the featural analysis harks back to the original analysis of Padden (1983) and suggests that verbs agree with the subject and the object in the morphosyntactic features of person and number (cf. Neidle et al. (2000) for a similar view). Rathmann and Mathur (2008) propose that the features are realized as follows.

- (4) Morphosyntactic features (Rathmann/Mathur 2008)
 - a. Person
 - First: $[+1] \leftrightarrow$ on/near chest (marked)
 - Non-first: $[-1] \leftrightarrow \emptyset$
 - b. Number
 - i. Features
 - Plural (collective): $[+pl] \leftrightarrow$ horizontal arc (marked)
 - Singular: $[-pl] \leftrightarrow \emptyset$
 - ii. Reduplication: exhaustive (distributive), dual

The features for the category of person follow Meier (1990). First person is realized as a location on or near the chest, while non-first person is realized as a zero form. Following Rathmann and Mathur (2002), the zero morpheme for non-first person may be matched with a deictic gesture within an interface between spatio-temporal conceptual structure and the articulatory-phonetic system in the architecture of grammar as articulated by Jackendoff (2002). This interface is manifested through signing space or gestural space (as it is called by Rathmann and Mathur). The realization of person features takes place through a process called ‘alignment’ (Mathur 2000), which is an instance of a readjustment process (Rathmann/Mathur 2002).

With respect to the category of number, two features are assumed. The plural feature, which is marked and encodes the collective reading, is realized as the multiple form. The possibility that the other plural forms are reduced to reduplication of the singular form is left for further investigation. The singular feature is unmarked and

realized as a zero form. We suggest that the realization of the multiple form occurs through affixal insertion, as evidenced by the fact that the morphological realization of number features is necessarily ordered after the realization of person features (Mathur 2002). See chapter 6, Plurality, for further discussion of plurality as it is marked on verbs.

3.4. Interface with gesture

The three approaches are now compared on the basis of how they account for the interaction of verb agreement with gestural space. As mentioned earlier, the linguistic system cannot directly refer to areas within gestural space (Lillo-Martin/Klima 1990; Liddell 1995). Otherwise, one runs into the trouble of listing an infinite number of areas in gestural space in the lexicon, an issue which Liddell (2000) raises and which Rathmann and Mathur (2002) describe in greater detail and call the listability issue. For example, the claim that certain verbs ‘agree’ with areas in gestural space is problematic, because that would require the impossible task of listing each area in gestural space as a possible agreement morpheme in the lexicon (Liddell 2000).

The above analyses have approached the issue of listability in different ways. The R-locus analysis avoids the listability issue by separating the R-locus from the R-index (Lillo-Martin/Klima 1990; Meir 1998, 2002). The linguistic system refers to the R-index and not to the R-locus. The connection between the R-index and the R-locus is mediated by discourse: the R-index receives its value from discourse and links to a referent, which is in turn associated with an R-locus. While the R-locus approach is clear about how non-first person is realized, the analysis leaves open the point at which the phonological content of the R-locus enters the linguistic system. On this question, Lillo-Martin and Meier (2011, 122) clarify that phonological specification of the R-index is not necessary; the specification is “determined on the surface by connection to paralinguistic gesture”.

The indicating analysis (Liddell 2003) takes the listability issue as a signal to avoid an analysis in terms of agreement. Through mental space theory, Liddell maintains a formal separation between linguistic elements and gestural elements but permits them to interact through the blending of mental space entities. At the same time, he proposes that one must memorize which verbs are mapped with mental entities for first person forms, for non-first person forms, and for plural forms. One implication is that singular forms are mapped with mental entities to the same extent as plural forms. On the other hand, Cormier (2002) has found multiple forms to be less indexical than singular forms, suggesting that plural forms are not always mapped with mental entities in the way expected by Liddell.

Another approach is the featural analysis of Rathmann and Mathur (2008), which agrees with the R-locus analysis in that the phenomenon constitutes agreement. The featural analysis sees agreement as being mediated through the features of the noun phrase instead of index-sharing or -copying. The set of features is finite – consisting just of person and number – and each feature has a finite number of values as well. Importantly, the non-first person feature is realized as a zero morpheme. Neidle et al. (2000) also recognize the importance of features in the process of agreement. They separate person from number and offer some contrasts under the feature of number.

Whereas they assume many person distinctions under the value of non-first person, the featural analysis assumes only one, namely a zero morpheme. The use of a zero morpheme is the featural analysis's solution to the listability issue.

The different approaches are compatible in several ways. First, while the R-locus analysis emphasizes the referential index and the featural analysis emphasizes features, they can be made compatible by connecting the index directly to features as has been done in spoken languages (cf. Cormier, Wechsler, and Meier 1998). Then the process of agreement can refer to these indices and features in syntax and morphology. The indicating analysis, on the other hand, rejects any process of agreement and places any person and number distinctions in the lexicon. The lexicon is one place where the indicating analysis and the featural analysis could be compatible: in the featural analysis, features are realized as morphemes which are stored in a 'vocabulary list' which is similar to the lexicon; if one assumes that verbs are combined with inflectional morphemes in the lexicon before syntax (and before they are combined with a gesture), the featural analysis and the indicating analysis would converge. However, the featural analysis as it stands does not assume that the lexicon generates fully inflected verbs; rather, verbs are inflected as part of syntax and spelled out through a post-lexical morphological component.

Otherwise, all approaches agree that linguistic elements must be allowed to interface with gestural elements. Whereas the R-locus analysis sees the interface as occurring in discourse (the R-index is linked to a discourse referent which is associated with an R-locus), and whereas the indicating analysis sees the interface as a blending of mental space entities with linguistic elements, the featural analysis sees the interface as linking spatio-temporal conceptual structure and articulatory-phonetic systems through gestural space.

There are then different ways to understand how the process of verb agreement interacts with gestural space. By investigating the different contexts in which verb agreement interfaces with gestural space, and by identifying constraints on this interface, we can begin to distinguish among predictions made by the various approaches to the issue of listability.

3.5. Cross-linguistic uniformity and variation

As mentioned in section 2, there is a tri-partite classification of verbs depending on whether they show agreement. Moreover, verbs that show agreement vary between single and double agreement. Then, the way that verbs mark agreement is through a change in orientation and/or direction of movement, and finally, they interact with gestural space. It turns that all of these properties, along with other properties, are attested in many of the sign languages documented to date, as observed by Newport and Supalla (2000) (see also the references provided in section 1).

To explain the uniformity of these properties across sign languages, the featural analysis looks to the development of the agreement process. Rathmann and Mathur (2008) suggest that the process of verb agreement emerges in many sign languages as a linguistic innovation, meaning that the process takes on the ability to interface with gestural space and then remains tied to this interface. Consequently, the process does

not become lexicalized, unlike the affixation of segmental morphemes which have potential to diverge in form across languages.

While mature sign languages are relatively uniform with respect to the properties discussed above, there is also some cross-linguistic variation. For instance, sign languages vary in whether they use an auxiliary-like element to mark agreement whenever the main verb is incapable of doing so due to phonological or pragmatic reasons (Rathmann 2000; see chapter 10 for discussion of agreement auxiliaries). Then, some sign languages, e.g. those in East Asia such as Japanese Sign Language (NS), use a kind of buoy (in the sense of Liddell 2003) to direct the form to. The buoy is realized by the non-dominant hand, and instead of the dominant hand being oriented/directed to an area within gestural space, the dominant hand is oriented/directed to the buoy. The buoy could represent an argument, and could take a -handshape (or a - or -handshape in NS for male and female referents, respectively). Finally, there are sign languages which have been claimed not to show the range of agreement patterns discussed above, such as Al-Sayyid Bedouin Sign Language, a sign language used in a village in the Negev desert in Israel (Aronoff et al. 2004), and Kata Kolok, a village sign language of Bali (Marsaja 2008) (see chapter 24, Shared Sign Languages, for further discussion of these sign languages).

The cross-linguistic variation across sign languages can again be accounted for by the diachronic development of the agreement process. Meier (2002) and Rathmann and Mathur (2008) discuss several studies (e.g. Engberg-Pedersen 1993; Supalla 1997; Senghas/Coppola 2001) which suggest that verb agreement becomes more sophisticated over time, in the sense that a language starts out by marking no or few person and number features and then progresses to marking more person and number features. That is, the grammaticalization of verb agreement seems to run in the direction of increasing complexity. Pfau and Steinbach (2006) have likewise outlined a path of grammaticalization for agreement, in which agreement marking and auxiliaries emerge only at the end of the path. The cross-linguistic variation across sign languages with respect to certain properties of verb agreement then can be explained by positing that the sign languages are at different points along the path of grammaticalization.

4. Candidacy for agreement

Even when morphological realization of person and number features is predicted, it does not always occur. This section seeks to explain why such realization does not always occur. Rathmann and Mathur (2005) demonstrate that phonetic/phonological constraints are not the only reason that morphological realization fails to occur. Another reason is that it takes time for some verbs to become grammaticalized to realize the features of agreement (for further discussion of grammaticalization, see chapter 34).

If a feature is not overtly realized on the verb, a sign language may use one of several strategies to encode the featural information. One way is to use overt pronouns (see chapter 11 on pronouns). Another way is to use word order (Fischer 1975). Yet another strategy is the insertion of an auxiliary-like element, a Person Agreement Marker (Rathmann 2000) (see chapter 10 on agreement auxiliaries).

This section focuses on the issue of how to determine which verbs participate in the process of agreement, since across sign languages only a small set of verbs participate in this process. Several approaches to this issue are considered: Padden (1983), Janis (1992, 1995), Meir (1998, 2002), Rathmann and Mathur (2002), and Quadros and Quer (2008).

4.1. Padden (1983)

Padden (1983) takes a lexical approach to determining which verbs participate in agreement: verbs are marked in the lexicon as agreeing, spatial, or plain, and only those verbs that are marked as agreeing participate in the process of agreement. Cormier, Wechsler, and Meir (1998) follow this approach within the HPSG framework: each verb is sorted by its lexical entry as plain, spatial, or agreeing. If the verb is agreeing, it is further sorted as single agreement or double agreement. Liddell (2003) takes a similar approach in relegating class membership to the lexicon, as verbs are marked with diacritic symbols indicating whether they require blending with a mental entity.

Such a lexical approach faces several problems. First, some verbs change their status over time. Some verbs start as plain and become agreeing over time (e.g. ASL TEST). Other verbs start as spatial and become agreeing (e.g. MOVE-A-PIECE-OF-PAPER becomes GIVE in ASL). The lexical approach misses the generalization that the boundaries between the classes are not fixed, and that verbs can migrate from one class to another in principled ways.

A second issue is that some verbs have dual status. That is, a verb can be agreeing in one context (cf. TEACH FRIEND) and plain in another context (cf. TEACH LINGUISTICS). (All examples in this paragraph are from ASL.) Likewise, a verb can be agreeing in some contexts (e.g. LOOK-AT FRIEND) or spatial in other contexts (LOOK-AT (ACROSS) BANNER). There are also verbs which seem spatial sometimes (DRIVE-TO SCHOOL) and plain other times (DRIVE-TO EVERYDAY). Under a lexical approach, a verb would either receive two specifications or a verb would have to be listed twice, each with a unique specification. The lexical approach then raises the issue of learnability, placing the burden on the child to learn both specifications (for the acquisition of agreement, see chapter 28). The lexical approach also leaves open the issue of when to use one of these verbs in a given context.

Since the lexical approach assumes that the class membership of each verb is unpredictable, it allows the possibility that each sign language assigns different verbs to each class. In fact, sign languages are largely similar with respect to the verbs that belong in each class. Thus, the lexical approach does not capture the generalization that verbs in each class share certain properties in common.

4.2. Janis (1992, 1995)

Recognizing the issues that a lexical approach to the class membership of verbs is faced with, Janis (1992, 1995) has developed an account that seeks to relate the conditions

on verb agreement to the case properties of the controller using the agreement hierarchy in (5).

- (5) Agreement Hierarchy (Janis 1995)
- | | |
|-------|---|
| case: | direct case < locative case |
| | |
| | GR: subject < direct object < indirect object |
| | SR: agent, experiencer', patient", recipient |
| | ' only with a verb that is not body-anchored |
| | " only if animate |

Janis (1992, 1995) distinguishes between agreement in ‘agreeing’ verbs and that in spatial verbs. She links the distinction to the case of the nominal controlling agreement. A nominal receives locative case “if it can be perceived either as a location or as being at a location that affects how the action or state expressed by the verb is characterized” (Janis 1995, 219). Otherwise, it receives direct case. If a nominal receives direct case, it controls agreement only if it has a feature from the list of grammatical roles (GR) as well as a feature from the list of semantic roles (SR). This requirement is indicated by a line connecting direct case to the two lists. In contrast, a nominal with locative case does not have to meet this requirement and can control agreement in any condition.

If a verb has only one agreement slot (i.e. if there is single agreement), and there are two competing controllers, the higher ranked nominal controls agreement. For example, in a sentence with a subject and a direct object, the direct object will control agreement because it is ranked above the subject in the agreement hierarchy. To account for optional subject agreement (as in double agreement), Janis (1995, 219) stipulates another condition as follows: “The lowest ranked controller cannot be the sole controller of agreement.” The lowest ranked controller in the above hierarchy is the subject. Thus, the effect of this condition is that whenever the subject controls an agreement slot, another nominal (e.g. the direct object) must control another agreement slot.

The agreement hierarchy proposed by Janis (1992, 1995) comes closer to capturing the conditions under which agreement occurs. At the same time, there are at least two issues facing this approach. First, the hierarchy is complex and contains a number of conditions that are difficult to motivate. For example, the hierarchy references not only case but also grammatical roles and semantic roles. Then, the hierarchy includes stipulations like “an experiencer controls agreement only with a verb that is not body-anchored” or “a patient controls agreement only if it is animate”. A second issue is that agreement has similar properties across many sign languages. To account for this fact, the hierarchy can be claimed to be universal for the family of sign languages. Yet it remains unexplained how the hierarchy has come into being for each sign language and why it is universal for this particular family.

4.3. Meir (1998, 2002)

To simplify the constraints on the process of verb agreement in sign languages, Meir (1998, 2002) developed another account that is inspired by the distinction between

regular and backwards verbs. As mentioned earlier in the chapter, the direction of movement in many verbs displaying agreement is from the area associated with the subject referent to the area associated with the object referent. However, there is a small set of verbs that show the opposite pattern. That is, the direction of movement is from the area associated with the object referent to the area associated with the subject referent.

There have been several attempts to account for the distinction between regular and backwards verbs, starting with Friedman (1976) and continuing with Padden (1983), Shepard-Kegl (1985), Brentari (1988), Janis (1992, 1995), Meir (1998, 2002), Mathur (2000), Rathmann and Mathur (2002), and Quadros and Quer (2008), among others. In short, Friedman (1976) and Shepard-Kegl (1985) propose a semantic analysis unifying regular and backwards verbs: both sets of verbs agree with the argument bearing the semantic role of *source* and the argument bearing the role of *goal*.

Padden (1983) points out that such verbs do not always agree with the goal, as in ASL FRIEND₁ INVITE₃ PARTY ('My friend invited me to a party'), where PARTY is the goal yet the verb agrees with the implicit object *me*. This led Padden (1983) to argue for a syntactic analysis on which the verb generally agrees with the subject and the object and the backwards verbs are lexically marked for showing the agreement in a different way than regular verbs.

Brentari (1988, 1998) and Janis (1992) hypothesize that a hybrid of semantic and syntactic factors is necessary to explain the distinction. Brentari (1988), for example, proposes a Direction of Transfer Rule which states that the path movement of the verb is away from the locus associated with the referent of the subject (syntactic) if the theme is transferred away from the subject (semantic), or else the movement is toward the locus of the subject referent.

Meir (1998, 2002) expands on the hybrid view and proposes the two Principles of Sign Language Agreement Morphology given in (6).

- (6) Principles of Sign Language Agreement Morphology (Meir 2002, 425)
 - (i) The direction of the path movement of agreement verbs is determined by the thematic roles of the arguments: it is from the R-locus of the source argument to the R-locus of the goal argument.
 - (ii) The facing of the hand(s) is determined by the syntactic role of the arguments: the facing is towards the object of the verb (indirect object in the case of ditransitive agreement verbs).

According to Meir, the direction of movement realizes the morpheme DIR which also appears with spatial verbs like ASL MOVE, PUT, and DRIVE-TO and reflects the semantic analysis. This element unifies regular and backwards verbs, since they both move from the R-locus of the source to the R-locus of the goal (in most cases). The facing of the hand(s) realizes a case-assigning morpheme and represents the syntactic analysis. The case assigner also unifies regular and backwards verbs, since both face the R-locus of the object. The difference between regular and backwards verbs lies in the alignment between the thematic and syntactic roles: in regular verbs, the source and goal are aligned with the subject and the object respectively, while it is the other way around for backwards verbs.

The analysis using the DIR morpheme and the case-assigning morpheme provides a straightforward way to categorize verbs with respect to whether they display agree-

ment. Plain verbs are those that do not have DIR or the case-assigning morpheme, while spatial verbs have only DIR and agreeing verbs have both. Since the case assigner is related to the notion of affectedness in the sense of Jackendoff (1987, 1990), it is predicted that only those verbs which select for an affected possessor show agreement. The analysis accounts for the uniformity of the properties of verb agreement across sign languages by attributing iconic roots to the morpheme DIR, which uses gestural space to show spatial relations, whether concrete or abstract. Presumably, the case-assigning morpheme has iconic roots such that the patterns of agreeing verbs (along with spatial verbs) are also universal.

4.4. Rathmann and Mathur (2002)

To predict which verbs participate in agreement, Rathmann and Mathur (2002) propose an animacy analysis, inspired by Janis (1992, 1995), that imposes a condition on the process of verb agreement: only those verbs which select for two animate arguments may participate in the process. The featural analysis refers to Rathmann and Mathur (2008), which focuses on the features that are involved in agreement and the emergence of agreement as a process, while the animacy analysis refers to Rathmann and Mathur (2002), which seeks to characterize the set of verbs that participate in agreement and the modality differences between sign and spoken languages with respect to agreement. To support the animacy analysis, they offer a number of diagnostic tests independent of argument structure to determine whether a verb participates in the process of agreement: the ability to display the first person object form (reversibility), the ability to display the multiple form, and the ability to co-occur with PAM (Person Agreement Marker, an auxiliary-like element) in sign languages that use such an element.

The animacy analysis predicts that regular verbs like ASL ASK and HELP and backwards verbs like TAKE and COPY participate in agreement. It also predicts that verbs like ASL BUY or THINK which select for only one animate argument do not participate in agreement. It also correctly predicts that a verb like ASL TEACH or LOOK-AT can participate in agreement only if the two arguments are animate. This suggests that agreement is not tied to specific classes of lexical items but relates to their use in particular sentences. Thus it is possible to use the multiple form with these verbs only in a sentence like *I taught many students* or *I looked at many students* but not in a sentence like *I taught many subjects* or *I looked across a banner*. While the latter sentences look similar to the agreement forms in that the orientation and direction of movement in the verbs reflect areas associated with a referent (as in *I looked at a book*), they are claimed to involve a different process than agreement, since they do not take the multiple form or co-occur with PAM.

To account for backwards verbs, the animacy analysis assumes that the backwards movement in those verbs is lexically fixed, which may be motivated by an account like Meir (1998) or Taub (2001). When the process of agreement applies to this lexically fixed movement, the resulting form yields the correct direction of movement and orientation. Further factors such as discourse considerations, phonetic and phonological constraints, and historical circumstances determine whether the agreement form in both regular and backwards verbs is ultimately realized.

Whereas the thematic analysis of Meir (1998, 2002) takes the DIR morpheme and the case-assigning morpheme to participate in the process of agreement, the animacy analysis assumes that verbs themselves participate in the process of agreement and that they do not require a complex morphological structure to do so.

4.5. Quadros and Quer (2008)

Quadros and Quer (2008) revisit the conditions on verb agreement by considering the properties of backwards verbs and auxiliaries in Brazilian Sign Language (LSB) and Catalan Sign Language (LSC). They argue against a thematic account of agreement in light of examples from LSB and LSC that share the same lexical conceptual structure but have lexicalized movements that run in the opposite direction: for instance, *ASK* is regular in LSB but backwards in LSC, and *ASK-FOR* is backwards in LSB but regular in LSC. In addition, they note that the same lexical conceptual structure in the same language can show both agreeing and non-agreeing forms, e.g. *BORROW* in LSC. Moreover, they claim that Rathmann and Mathur's (2008) diagnostics for distinguishing between agreeing and spatial verbs do not work in LSB and LSC, leading Quadros and Quer to question whether it is necessary to distinguish between agreeing and spatial verbs. This question will need to be addressed by carefully re-examining the diagnostic criteria for agreeing and spatial verbs across sign languages.

Quadros and Quer (2008) offer an alternative view in which two classes of verbs can be distinguished according to their syntactic properties: agreeing and non-agreeing. Their class of agreeing verbs includes what have been called agreeing and spatial verbs in Padden's (1983) typology. Semantic factors distinguish between agreeing and spatial verbs; thus, agreeing verbs (in the sense of Padden 1983) agree with R-loci which manifest person and number features, while spatial verbs agree with spatial features. Otherwise, the agreement form in both types of verbs is realized as a path. To support this view, they claim that it is possible for a verb to agree with both a nominal and a locative. By unifying the process of agreement across agreeing and spatial verbs, they remove the need for a special condition on the process of agreement.

Quadros and Quer provide two pieces of evidence that agreement with R-loci constitutes syntactic agreement. First, along with Rathmann and Mathur (2008), they observe that when an auxiliary appears with a backwards verb, the direction of movement in the auxiliary is from the area associated with the subject referent to the area associated with the object referent, even when the direction of movement in the backwards verb is the opposite. Second, they note with Rathmann and Mathur (2008) that auxiliaries appear only with those backwards verbs that take animate objects and not with backwards verbs that take inanimate objects.

Quadros and Quer (2008) take a view on backwards verbs that is different from that of Meir (1998) and Rathmann and Mathur (2008): they treat backwards verbs as handling verbs with a path that agrees with locations as opposed to syntactic arguments; that is, they treat them as spatial verbs. Otherwise, backwards verbs are still grouped together with regular verbs, because they adopt a broader view of verb agreement in sign languages: it is not just restricted to person and number features but also occurs with spatial features. While this broader view can explain cross-linguistic similarities with respect to properties of verb agreement, it has yet to overcome the

issue of listability. It is possible to resolve the listability issue with person and number issues by having a minimum of two contrastive values. It is, however, less clear whether it is possible to do the same with spatial features.

4.6. Discussion

Several approaches regarding the conditions on agreement have been presented. One approach, exemplified by Padden (1983) and Liddell (2003), lets the lexicon predict when a verb participates in agreement. Janis (1992) argues that an agreement hierarchy based on case and other grammatical properties determines which verbs display agreement. Meir (1998) seeks to simplify this mechanism through a thematic approach: verbs that contain a DIR morpheme and a case-assigning morpheme qualify for agreement. Rathmann and Mathur (2008) suggest doing away with the case-assigning morpheme and restricting the process of agreement to those verbs that select for two animate arguments. Quadros and Quer (2008), on the other hand, group backwards verbs with spatial verbs and agreeing verbs with spatial verbs, thus removing the need for a special condition. Another possibility, which has recently been proposed by Steinbach (2011), is that verb agreement should be considered as part of a unified agreement process along with role shift and classifier agreement.

The issue of whether verb agreement in sign languages needs a particular condition awaits further empirical investigation of the argument structure of verbs that undergo agreement and those that do not across a number of sign languages. If it turns out that there is a condition (however it is formulated) on the process of agreement, as argued by Janis (1992), Meir (1998), and Rathmann and Mathur (2008), this would be one instance in which verb agreement in sign languages differs from that in spoken languages.

5. Conclusion: agreement in sign and spoken languages

We now go back to the questions raised at the beginning and consider how sign languages compare with one another and with spoken languages with respect to the realization of person and number features or the lack thereof. The preceding sections suggest the following picture.

With regard to similarities across signed and spoken languages, the requirement that the set of person and number features of the arguments be realized in some way appears to be universal. The realization of person and number features can be explained through an agreement process that is common to both modalities. The agreement process, as well as the features underlying the process, may be made available by universal principles of grammar, so that it appears in both signed and spoken languages.

At the same time, there are important differences between signed and spoken languages with regard to agreement. First, the agreement process in sign languages is restricted to a smaller set of verbs, whereas agreement in spoken languages, if it is marked at all, is usually marked on the whole set of verbs (setting aside exceptions).

This cross-modal difference could be resolved if the agreement process in sign languages is understood to be one of several distinct agreement processes available to sign languages, and that the choice of a particular agreement process depends on the argument structure of the verb. If that is the case, and if one takes into account that there are likewise restrictions on the agreement process in many spoken languages (Corbett 2006), sign languages are no different to spoken languages in this regard.

Another cross-modal difference is that the properties of agreement are more uniform across sign languages than across spoken languages. This difference can be explained by yet another cross-modal difference: specific agreement forms in sign languages, in particular the non-first person singular form, require interaction with gestural space, whereas this interaction is optional for spoken languages. Since gestural space is universally available to all languages, and since it is involved in the realization of certain person and number features in sign languages, these considerations would explain why verb agreement looks remarkably similar across mature sign languages.

The cross-modal similarities can then be traced to universal principles of grammar, while the cross-modal differences are rooted in the visual-manual modality of sign languages.

6. Literature

- Aarons, Debra/Bahan, Ben/Kegl, Judy/Neidle, Carol
 1992 Clausal Structure and a Tier for Grammatical Marking in American Sign Language. In: *Nordic Journal of Linguistics* 15, 103–142.
- Aronoff, Mark/Meir, Irit/Sandler, Wendy
 2005 The Paradox of Sign Language Morphology. In: *Language* 81, 301–344.
- Aronoff, Mark/Padden, Carol/Meir, Irit/Sandler, Wendy
 2004 Morphological Universals and the Sign Language Type. In: Booij, Geert/Marle, Jaap van (eds.), *Yearbook of Morphology 2004*. Dordrecht: Kluwer Academic Publishers, 19–40.
- Bahan, Ben
 1996 *Non-manual Realization of Agreement in American Sign Language*. PhD Dissertation, Boston University.
- Bos, Heleen
 1994 An Auxiliary Verb in Sign Language of the Netherlands. In: Ahlgren, Inger/Bergman, Brita/Brennan, Mary (eds.), *Perspectives on Sign Language Structure: Papers from the Fifth International Symposium on Sign Language Research, Vol. 1*. Durham: International Sign Linguistic Association, 37–53.
- Brentari, Diane
 1988 Backwards Verbs in ASL: Agreement Re-opened. In: MacLeod, Lynn (ed.), *Parasession on Agreement in Grammatical Theory (CLS 24, Vol. 2)*. Chicago: Chicago Linguistic Society, 16–27.
- Cormier, Kearsy
 2002 *Grammaticization of Indexic Signs: How American Sign Language Expresses Numerosity*. PhD Dissertation, The University of Texas at Austin.
- Cormier, Kearsy/Wechsler, Stephen/Meier, Richard
 1998 Locus Agreement in American Sign Language. In: Webelhuth, Gert/Koenig, Jean-Pierre/Kathol, Andreas (eds.), *Lexical and Constructional Aspects of Linguistic Explanation*. Stanford, CA: CSLI, 215–229.

- Engberg-Pedersen, Elisabeth
 1993 *Space in Danish Sign Language: The Semantics and Morphosyntax of the Use of Space in a Visual Language*. Hamburg: Signum.
- Fauconnier, Gilles
 1985 *Mental Spaces: Aspects of Meaning Construction in Natural Language*. Cambridge, MA: MIT Press.
- Fauconnier, Gilles
 1997 *Mappings in Thought and Language*. Cambridge: Cambridge University Press.
- Fischer, Susan
 1975 Influences on Word Order Change in American Sign Language. In: Li, Charles (ed.), *Word Order and Word Order Change*. Austin, TX: The University of Texas Press, 1–25.
- Fischer, Susan
 1996 The Role of Agreement and Auxiliaries in Sign Languages. *Lingua* 98, 103–120.
- Fischer, Susan/Gough, Bonnie
 1978 Verbs in American Sign Language. *Sign Language Studies* 18, 17–48.
- Friedman, Lynn
 1976 The Manifestation of Subject, Object, and Topic in the American Sign Language. In: Li, Charles (ed.), *Subject and Topic*. New York, NY: Academic Press, 125–148.
- Hahm, Hyun-Jong
 2006 Person and Number Agreement in American Sign Language. In: Müller, Stefan (ed.), *Proceedings of the 13th International Conference on Head-Driven Phrase Structure Grammar*. Stanford, CA: CSLI, 195–211.
- Hong, Sung-Eun
 2008 *Eine Empirische Untersuchung zu Kongruenzverben in der Koreanischen Gebärdensprache*. Hamburg: Signum.
- Jackendoff, Ray
 2002 *Foundations of Language: Brain, Meaning, Grammar, Evolution*. Oxford: Oxford University Press.
- Janis, Wynne
 1992 *Morphosyntax of ASL Verb Phrase*. PhD Dissertation, State University of New York, Buffalo.
- Janis, Wynne
 1995 A Cross-linguistic Perspective on ASL Verb Agreement. In: Emmorey, Karen/Reilly, Judy (eds.), *Language, Gesture, and Space*. Hillsdale, NJ: Lawrence Erlbaum, 195–223.
- Johnston, Trevor/Schembri, Adam
 2007 *Australian Sign Language: An Introduction to Sign Language Linguistics*. Cambridge: Cambridge University Press.
- Klima, Edward/Bellugi, Ursula
 1979 *The Signs of Language*. Cambridge, MA: Harvard University Press.
- Lacy, Richard
 1974 Putting Some of the Syntax Back Into Semantics. Paper Presented at the *Annual Meeting of the Linguistic Society of America*, New York.
- Liddell, Scott
 1990 Four Functions of a Locus: Re-examining the Structure of Space in ASL. In: Lucas, Ceil (ed.), *Sign Language Research: Theoretical Issues*. Washington, DC: Gallaudet University Press, 176–198.
- Liddell, Scott
 1995 Real, Surrogate, and Token Space: Grammatical Consequences in ASL. In: Emmorey, Karen/Reilly, Judy (eds.), *Language, Gesture, and Space*. Hillsdale, NJ: Lawrence Erlbaum, 19–42.
- Liddell, Scott
 2000 Indicating Verbs and Pronouns: Pointing Away from Agreement. In: Emmorey, Karen/Lane, Harlan (eds.), *The Signs of Language Revisited: An Anthology to Honor Ursula Bellugi and Edward Klima*. Mahwah, NJ: Lawrence Erlbaum, 303–320.

- Liddell, Scott
2003 *Grammar, Gesture and Meaning in American Sign Language*. Cambridge: Cambridge University Press.
- Liddell, Scott/Metzger, Melanie
1998 Gesture in Sign Language Discourse. In: *Journal of Pragmatics* 30, 657–697.
- Lillo-Martin, Diane/Klima, Edward
1990 Pointing out Differences: ASL Pronouns in Syntactic Theory. In: Fischer, Susan/Siple, Patricia (eds.), *Theoretical Issues in Sign Language Research, Vol. 1: Linguistics*. Chicago: University of Chicago Press, 191–210.
- Lillo-Martin, Diane/Meier, Richard
2011 On the Linguistic Status of ‘Agreement’ in Sign Languages. In: *Theoretical Linguistics* 37, 95–141.
- Marsaja, I Gede
2008 *Desa Kolok – A Deaf Village and Its Sign Language in Bali, Indonesia*. Nijmegen: Ishara Press.
- Massone, Maria I./Curiel, Monica
2004 Sign Order in Argentine Sign Language. In: *Sign Language Studies* 5, 63–93.
- Mathur, Gaurav
2000 *Verb Agreement as Alignment in Signed Languages*. PhD Dissertation, Massachusetts Institute of Technology.
- Mathur, Gaurav
2002 Number and Agreement in Signed Languages. Paper Presented at the *Linguistics Association of Great Britain Spring Meeting*, Liverpool.
- Mathur, Gaurav/Rathmann, Christian
2006 Variability in Verb Agreement Forms Across Four Sign Languages. In: Goldstein, Louis/Best, Catherine/Whalen, Douglas (eds.), *Laboratory Phonology VIII: Varieties of Phonological Competence*. Berlin: Mouton de Gruyter, 285–314.
- Mathur, Gaurav/Rathmann, Christian
2010 Verb Agreement in Sign Language Morphology. In: Brentari, Diane (ed.), *Sign Languages: A Cambridge Language Survey*. Cambridge: Cambridge University Press, 173–196.
- McBurney, Susan
2002 Pronominal Reference in Signed and Spoken Language: Are Grammatical Categories Modality-dependent? In: Meier, Richard/Cormier, Kearsy/Quinto-Pozos, David (eds.), *Modality and Structure in Signed and Spoken Languages*. Cambridge: Cambridge University Press, 329–369.
- Meier, Richard
1982 *Icons, Analogues, and Morphemes: The Acquisition of Verb Agreement in American Sign Language*. PhD Dissertation, University of California, San Diego.
- Meier, Richard
1990 Person Deixis in American Sign Language. In: Fischer, Susan/Siple, Patricia (eds.), *Theoretical Issues in Sign Language Research, Vol. 1: Linguistics*. Chicago: University of Chicago Press, 175–190.
- Meir, Irit
1998 *Thematic Structure and Verb Agreement in Israeli Sign Language*. PhD Dissertation, The Hebrew University of Jerusalem.
- Meir, Irit
2002 A Cross-modality Perspective on Verb Agreement. In: *Natural Language and Linguistic Theory* 20, 413–450.
- Neidle, Carol/Kegl, Judy/MacLaughlin, Dawn/Bahan, Ben/Lee, Robert
2000 *The Syntax of American Sign Language: Functional Categories and Hierarchical Structure*. Cambridge, MA: MIT Press.

- Newport, Elissa/Supalla, Ted
 2000 Sign Language Research at the Millennium. In: Emmorey, Karen/Lane, Harlan (eds.), *The Signs of Language Revisited: An Anthology to Honor Ursula Bellugi and Edward Klima*. Mahwah, NJ: Lawrence Erlbaum, 103–114
- Padden, Carol
 1983 *Interaction of Morphology and Syntax in American Sign Language*. PhD Dissertation, University of California, San Diego [Published 1988 by Garland Outstanding Dissertations in Linguistics, New York].
- Pfau, Roland/Steinbach, Markus
 2006 Modality-independent and Modality-specific Aspects of Grammaticalization in Sign Languages. In: *Linguistics in Potsdam* 24, 5–98.
- Pollard, Carl/Sag, Ivan
 1994 *Head-Driven Phrase Structure Grammar*. Chicago: University of Chicago Press.
- Quadros, Ronice de
 1999 *Phrase Structure of Brazilian Sign Language*. PhD Dissertation, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre.
- Quadros, Ronice de/Quer, Josep
 2008 Back to Back(wards) and Moving on: On Agreement, Auxiliaries and Verb Classes. In: Quadros, Ronice M. de (ed.), *Sign Languages: Spinning and Unraveling the Past, Present, and Future. Forty-five Papers and Three Posters from the 9th Theoretical Issues in Sign Language Research Conference, Florianopolis, Brazil, December 2006*. Petrópolis: Editora Arara Azul.
 [Available at: www.editora-arara-azul.com.br/EstudosSurdos.php].
- Quer, Josep/Frigola, Santiago
 2006 Cross-linguistic Research and Particular Grammars: A Case Study on Auxiliary Predicates in Catalan Sign Language (LSC). Paper Presented at *Workshop on Cross-linguistic Sign Language Research*, Max Planck Institute for Psycholinguistics, Nijmegen.
- Rathmann, Christian
 2000 *The Optionality of Agreement Phrase: Evidence from Signed Languages*. MA Thesis, The University of Texas at Austin.
- Rathmann, Christian/Mathur, Gaurav
 2002 Is Verb Agreement the Same Cross-modally? In: Meier, Richard/Cormier, Kearsy/Quinto-Pozos, David (eds.), *Modality and Structure in Signed and Spoken Languages*. Cambridge: Cambridge University Press, 370–404.
- Rathmann, Christian/Mathur, Gaurav
 2005 Unexpressed Features of Verb Agreement in Signed Languages. In: Booij, Geert/Guevara, Emiliano/Ralli, Angela/Sgroi, Salvatore/Scalise, Sergio (eds.), *Morphology and Linguistic Typology. On-line Proceedings of the 4th Mediterranean Morphology Meeting (MMM4)*. Università degli Studi di Bologna, 235–250.
- Rathmann, Christian/Mathur, Gaurav
 2008 Verb Agreement as a Linguistic Innovation in Signed Languages. In: Quer, Josep (ed.), *Signs of the Time: Selected Papers from TISLR 2004*. Hamburg: Signum, 191–216.
- Sandler, Wendy/Lillo-Martin, Diane
 2006 *Sign Language and Linguistic Universals*. Cambridge: Cambridge University Press.
- Sapountzaki, Galini
 2005 *Free Functional Elements of Tense, Aspect, Modality and Agreement as Possible Auxiliaries in Greek Sign Language*. PhD Dissertation, University of Bristol.
- Senghas, Ann/Coppola, Marie
 2001 Children Creating Language: How Nicaraguan Sign Language Acquired a Spatial Grammar. In: *Psychological Science* 12, 323–328.
- Shepard-Kegl, Judy
 1985 *Locative Relations in American Sign Language: Word Formation, Syntax, and Discourse*. PhD Dissertation, Massachusetts Institute of Technology.

Smith, Wayne

- 1990 Evidence for Auxiliaries in Taiwan Sign Language. In: Fischer, Susan/Siple, Patricia (eds.), *Theoretical Issues in Sign Language Research, Vol. 1: Linguistics*. Chicago: University of Chicago Press, 211–228.

Steinbach, Markus

- 2011 Dimensions of Sign Language Agreement: From Phonology to Semantics. Invited Lecture at *Formal and Experimental Advances in Sign Language Theory (FEAST)*, Venice.

Supalla, Ted

- 1997 An Implicational Hierarchy in Verb Agreement in American Sign Language. Manuscript, University of Rochester.

Sutton-Spence, Rachel/Woll, Bencie

- 1999 *The Linguistics of British Sign Language: An Introduction*. Cambridge: Cambridge University Press.

Taub, Sarah

- 2001 *Language from the Body: Iconicity and Metaphor in American Sign Language*. Cambridge: Cambridge University Press.

Thompson, Robin/Emmorey, Karen/Kluender, Robert

- 2006 The Relationship Between Eye Gaze and Agreement in American Sign Language: An Eye-tracking Study. In: *Natural Language and Linguistic Theory* 24, 571–604.

Zeshan, Ulrike

- 2000 *Sign Language in Indopakistan: A Description of a Signed Language*. Amsterdam: Benjamins.

Zwitserslood, Inge/Gijn, Ingeborg van

- 2006 Agreement Phenomena in Sign Language of the Netherlands. In: Ackema, Peter/Brandt, Patrick/Schoorlemmer, Maaïke/Weerman, Fred (eds.), *Arguments and Agreement*. Oxford: Oxford University Press, 195–229.

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