

III. Syntax

12. Word order

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Abstract

This chapter explores issues relating to word order and sign languages. We begin by sketching an outline of the key issues involved in tackling word order matters, regardless of modality of language. These include the functional aspect of word order, the articulatory issues associated with simultaneity in sign languages, and the question of whether one can identify a basic word order. Though the term ‘constituent order’ is more accurate, we will for convenience continue to use the term ‘word order’ given its historical importance in the literature. We go on to discuss the relationship between signs and words before providing a historically-based survey of research on word order in sign languages. We follow Woll’s (2003) identification of three important phases of research: the first concentrating on similarities between sign and spoken languages; the second focussing on the modality of sign languages; and the third switching the emphasis to typological studies. We touch on the importance of such issues as non-manual features, simultaneity, and pragmatic processes like topicalisation. The theoretical stances of scholars cited include functional grammar, cognitive grammar, and generative grammar.

1. Word order – some background issues

In our discussion of word order, we follow Bouchard and Dubuisson (1995), who identify three aspects important to word order:

- (i) a functional aspect, where the order of items provides information about the combination of words and which, in turn, provides guidance on how to interpret the sentence (section 1.1);
- (ii) an articulatory aspect which (for spoken languages) arises because generally, it is impossible to articulate more than one sound at a time (section 1.2);
- (iii) the presumption of the existence of a basic word order (section 1.3).

1.1. The functional aspect

Based on the identification of discrete constituents, which we discuss in the next section, cross-linguistic and typological research has identified a range of associations between specific orders in languages and particular functions. For example, ordering relations have been identified between a verb and its arguments, whether expressed as affixes or separate phrases, which identify the propositional structure of the clause. We may refer to a language that exhibits this behaviour as *argument configurational*. This may be achieved indirectly through a system of grammatical relations (subject, object, etc.) or directly via semantic roles (agent, patient, etc.). Greenberg's (1966) well-known work on word order typology, which characterises languages as SVO, SOV, etc., assumes the ubiquity of this role of order in the determination of propositional meaning. However, scholars working on other spoken languages like Chinese (LaPolla 1995) or Hungarian (Kiss 2002) have argued that the primary role of order in these languages is to mark information structure distinctions such as focus and topic. Such languages have been termed *discourse configurational* (Kiss 1995). There have also been claims that some spoken languages have free word order, for example Warlpiri (Hale 1983) and Jingulu (Pensalfini 2003). These languages, which have been termed *non-configurational*, are said not to employ order for any discernible linguistic function. In the Generative Grammar literature, surface non-configurationality is often countered by positing more abstract hierarchical structure (see Sandler/Lillo-Martin (2006, 301–308) for this strategy applied to sign languages).

These distinct ordering patterns of argument configurational, discourse configurational, and non-configurational have also been identified for sign languages. Following Liddell's (1980) early descriptions of word order in American Sign Language (ASL), Valli, Lucas, and Mulrooney (2006) identify ASL as argument configurational, reflecting grammatical relations such as subject and object (also see Wilbur 1987, Neidle et al. 2000). Similar claims have been made for Italian Sign Language (LIS, Volterra et al. 1984), German Sign Language (DGS, Glück/Pfau 1998), and Brazilian Sign Language (LSB, de Quadros 1999). On the other hand, various scholars have argued for discourse configurational accounts, for example, Deuchar (1983) writing on British Sign Language (BSL), Engberg-Pedersen (1994) on Danish Sign Language (DSL), and Nadeau and Desouvrey (1994) on Quebec Sign Language (LSQ).

1.2. The articulatory aspect

The articulatory aspect raises issues about chronological sequence and discreteness and links directly to the issue of modality. The fact that sign languages can express different aspects of information at the same time differentiates them from spoken languages (even when taking into account prosodic elements such as tone) in terms of the degree of simultaneity. Simultaneity can be encoded both non-manually and manually. As for the former type of simultaneity, there is a striking amount of similarity across described sign languages regarding non-manuals marking interrogatives (including wh-questions and yes/no-questions), negation, topic-comment structure, conditionals, etc. (see, for example, Vermeerbergen/Leeson/Crasborn 2007). Vermeerbergen and Leeson (2011)

note that the similarities documented to date go beyond functionality: form is also highly similar. Across unrelated sign languages, *wh*-questions, for example, are marked by a clustering of non-manual features (NMFs) of which furrowed brows are most salient, while for *yes-no* questions, raised brows are the most salient feature (see chapter 14, *Sentence Types*, for discussion). The fact that sign languages, due to the availability of two articulators (the two hands), also allow for manual simultaneity compounds the issue, and is one we return to again in section 2.

Given all this, it is probably not surprising that the issue of word order, when assumed as a chronologically linear concept, is controversial for studies of sign languages. Indeed, it is from consideration of *wh*-questions that Bouchard and Dubuisson (1995) make their argument against the existence of a basic word order for sign languages (also see Bouchard (1997)). On this point, Perniss, Pfau, and Steinbach (2007) note that there seems to be a greater degree of variance across sign language interrogatives with respect to manual marking (e.g. question word paradigms, question particles, word order) than for non-manual marking, although differences in terms of the form and scope of non-manual marking are also attested.

1.3. Basic word order

In many discussions of the mappings between orders and functions, there is a presumption that one order is more basic than others. In this view, the basic word order is then changed to communicate other functions. Such changed orders may be seen as ‘marked’ or ‘atypical’ in some way. More elaborate versions of this approach might identify a range of order-function pairings, within each of which there may occur marked or atypical orders. Generally, the criteria for identifying basic word order include the following (Brennan 1994, 19, also see Dryer 2007):

- (i) the order that is most frequent;
- (ii) the word order of simple, declarative, active clauses with no complex words or noun phrases;
- (iii) the word order that requires the simplest syntactic description;
- (iv) the order that is accompanied by the least morphological marking;
- (v) the order that is most neutral, i.e. that is the least pragmatically marked.

Based on these criteria, some scholars have argued for the existence of a basic word order in certain sign languages. Basic SVO order has been identified in, for instance, ASL and LSB, while LIS and DGS have been argued to have basic SOV order. These two word order patterns are illustrated by the ASL and LIS examples in (1), taken from Liddell (1980, 19) and Cecchetto/Geraci/Zucchi (2009, 282), respectively.

- | | | |
|-----|-------------------------------|-------|
| (1) | a. WOMAN FORGET PURSE | [ASL] |
| | ‘The woman forgot the purse.’ | |
| | b. GIANNI MARIA LOVE | [LIS] |
| | ‘Gianni loves Maria.’ | |

However, as noted above, some scholars question the universality of basic word order. Bouchard and Dubuisson (1995), for example, argue that “only languages in which

word order has an important functional role will exhibit a basic order” (1995, 100). Their argument is that the modality of sign languages reduces the importance of order as “there are other means that a language can use to indicate what elements combine” (1995, 132). The notion of basic word order usually underlies the identification of functional type in that the type is usually based on a postulated basic word order, which then may undergo changes for pragmatic reasons or to serve other functions. Massone and Curiel (2004), for instance, identify Argentine Sign Language (LSA) as argument configurational (SOV) in its basic word order but describe pragmatic rules such as topicalisation that may alter this basic order (see section 3.2 for further discussion).

2. Word order and sign languages

We might start by asking whether it is appropriate to term the ordering of constituents in a sign language as ‘word order’. Brennan (1994) concludes that while there are difficulties with terms that originate in the examination of spoken languages, the unit that is known as ‘the sign’ in sign languages

clearly functions as the linguistic unit that we know as the word. We do not usually exploit a separate term for this unit in relation to written as opposed to spoken language, even though notions of written word and spoken word are not totally congruous.

(Brennan 1994, 13)

Brennan thus uses the term ‘word’ in a general sense to incorporate spoken, sign, and written language. She uses the term ‘sign’ when referring only to sign languages, taking as given that ‘signs’ are equivalent to ‘words’ in terms of grammatical role. However, in the same volume, Coerts (1994a,b), investigating word order in Sign Language of the Netherlands (NGT), refers explicitly to constituent structure. She does not explicitly motivate her choice of terminology (a problem that impacts on attempts at later typological work; see, for example, Johnston et al. (2007)), but it seems that as she is concerned with the ordering of elements within a fixed set of parameters, the discussion of constituents seems more appropriate.

Leaving this debate regarding terminology aside, we can say that the issue of identifying a basic constituent order(s) in a sign language is complex. However, given the fact that sign languages are expressed in another modality, one which makes use of three-dimensional space and can employ simultaneous production of signs using the major articulators (i.e. the arms and hands), we also encounter questions that are unique to research on sign languages. These include questions regarding the degree and extent of simultaneous patterning, the extent of iconicity at syntactic and lexical levels, and the applicability to sign languages of a dichotomy between languages whose constituent orders reflect syntactic functions and those whose orders reflect pragmatic functions (after Brennan 1994, 29f.).

The challenge posed by simultaneity is illustrated by the examples in (2). In the NGT example in (2a), we observe full simultaneity of the verb and the direct object (which is expressed by a classifier); it is therefore impossible to decide whether we are dealing with SVO or SOV order (Coerts 1994b, 78). The Jordanian Sign Language (LIU) example in (2b) is even more complex (Hendriks 2008, 142f.; note that the

signer is left-handed). The Figure (the subject ‘car’) and the Ground (the locative object ‘bridge’) are introduced simultaneously by classifiers. Subsequently, the classifier representing the car is first held in place, then moved with respect to the Ground, and then held in place again, taking on different grammatical roles in subsequent clauses. Clearly, it would be challenging, if not impossible, to determine word order in this example (see Miller (1994) and papers in Vermeerbergen/Leeson/Crasborn (2007) for discussion of different types of simultaneity; also see example (7) below),

- (2) a. R: WOMAN CUT_{3b} [NGT]
 L: CL(thread)_{3b}
 ‘The woman cuts the thread.’
- b. R: CL:VEHICLE_{forward hold backward-forward hold} [LIU]
 L: CL:BRIDGE KNOW CL:BRIDGE STAY WHAT
 R: hold
 L: CL:VEHICLE_{move forward repeatedly} INDEX_{CL:vehicle}
 ‘The car passed under the bridge, you get it? It passed under the bridge and stayed there. What (could he do)? That parked car was passed by other cars.’

In relation to the ordering of constituents within sign languages, Brennan notes that

there is a reasonable body of evidence to indicate that sequential ordering of signs does express such relationships, at least some of the time, in all of the signed languages so far studied. However, we also know from the studies available that there are other possible ways. (Brennan 1994, 31)

Among these “other possible ways”, we can list the addition of specific morphemes to the form of the verb, which allows for the expression of the verb plus its arguments (see section 4.3). Brennan makes the point that we cannot talk about SVO or SOV or VSO ordering if the verb and its arguments are expressed simultaneously within the production of a single sign, as is, for example, the case in classifier constructions (see chapter 8 for discussion). This, and other issues related to the expression of simultaneity are taken up in Vermeerbergen, Leeson, and Crasborn (2007).

3. A timeline for sign linguistic research: how does word order work fit in?

Woll (2003) has described research on sign languages as falling into three broad categories: (i) the modern period, (ii) the post-modern period, and (iii) typological research (see chapter 38 for the history of sign linguistic research). We suggest that work on word order can be mapped onto this categorization, bearing in mind that the categories suggested by Woll are not absolute. For example, while ASL research may have entered into the post-modern stage in the early 1980s, the fact that for many other under-described sign languages, the point of reference for comparative purposes has frequently been ASL or BSL implies that for these languages, some degree of cross-linguistic work has always been embedded in their approach to description. However,

the conscious move towards typological research, taking on board findings from the field of gesture research and awareness of the scope of simultaneity in word order, is very much a hallmark of early twenty-first century research. We address work that can be associated with the modern and post-modern period in the following two subsections and turn to typological research in section 4.

3.1. The modern period and word order research

Early research tended to focus on the description of individual sign languages with reference to the literature on word order in spoken languages, and concentrated mostly on what made sign languages similar to spoken languages rather than on what differentiated them from each other. This links to Woll's 'modern period'. For example, early research focused on the linearity of expression in sign languages without reference to modality-related features of sign languages like manual simultaneity, iconicity, etc. (e.g., Fischer 1975; Liddell 1977). Fischer (1975), for instance, describes ASL as having an underlying SVO pattern at the clause level, but also notes that alternative orders exist (such as the use of topic constructions in certain instances, yielding OSV order). In contrast, Friedman (1976) claims that word order in ASL is relatively free with a general tendency for verbs to appear sentence-finally, also arguing that the subject is not present in the majority of her examples. However, Liddell (1977) and Wilbur (1987) questioned Friedman's analysis, criticising that she did not recognise the ways in which ASL verbs inflect to mark agreement, a point of differentiation between spoken and sign languages, which we can align with Woll's post-modern period of research.

3.2. The post-modern period and word order research

In the post-modern period, which Woll pinpoints as having its beginnings in the 1980s, researchers began to look at the points of differentiation between sign and spoken languages, leading to work focussing on the impact of language modality on syntax. The beginnings of work on word order in BSL, for example, fall into this timeframe. As with the work on ASL reviewed above, Deuchar (1983) raises the question of whether BSL is an SVO language but argues that a more functional topic-comment analysis might more fully account for the data than one that limits itself to sign order *per se*. Deuchar drew on Li and Thompson's (1976) work on the definition of topics, demonstrating links to the functionalist view on language. Her work also seeks to compare BSL with ASL, thus representing an early nod towards typological work for sign languages. For example, in exploring the function of topics in BSL, Deuchar did not find the slight backward head tilt being used as a marker of topicalisation in BSL which had been described by Liddell (1980) for ASL. However, she found that NMFs marked the separation of topic and comment in her data: topics were marked by raised eyebrows while the comments were marked by a headnod (a description which also differs slightly from that given by Baker-Shenk and Cokely (1980) for ASL).

By the late 1980s and into the 1990s, work on ASL also began to make greater reference to topic marking and other points of differentiation such as simultaneity (e.g., Miller 1994). We note here that Miller also looked at LSQ, thus marking a move towards cross-linguistic, typological studies.

Work that addresses the word order issue from a functionalist-cognitive viewpoint argues that topic-comment structure reflects basic ordering in ASL (and probably other sign languages) and is pervasive across ASL discourse (e.g., Janzen 1998, 1999), noting, however, that this sense of pervasiveness is lost when topic-comment structure is considered as just one of several sentence types that arises. Janzen presents evidence from a range of historical and contemporary ASL monologues that suggests that topics grammaticalized from yes/no-question structure and argues that topics function as ‘pivots’ in the organisation of discourse. He suggests that topics in ASL arise in pragmatic, syntactic, and textual domains, but that in all cases, their prototypical characteristic is one of being ‘backward looking’ to a previous identifiable experience or portion of the text, or being ‘forward looking’, serving as the ground for a portion of discourse that follows. The examples in (3) illustrate different pragmatic discourse motivations for topicalisation (Janzen 1999, 276 f., glosses slightly adapted). In example (3a), the string *I’ll see Bill* is new information while the topicalised temporal phrase *NEXT-WEEK* situates the event within a temporal framework. In (3b), the object functions as topic because “the signer does not feel he can proceed with the proposition until it is clear that certain information has become activated for the addressee”.

- Another, yet related, theoretical strand influencing work on aspects of constituent ordering is that of cognitive linguistics, which emphasises the relationship between cognitive processes and language use (Langacker 1991). Work in this genre has pushed forward new views on aspects of verbal valence such as detransitivisation and passive constructions (Janzen/O'Dea/Shaffer 2001; Leeson 2001). Cognitive linguistics accounts typically frame the discussion of word order in terms of issues of categorisation, prototype theory, the influence of gesture and iconicity with respect to the relationship between form and meaning, and particularly the idea of iconicity at the level of grammar. The identification of underlying principles of cognition evidenced by sign language structures is an important goal. Work in this domain is founded on that of authors such as Jackendoff (1990) and Fauconnier (1985, 1997) and has led to a growing body of work by sign linguists working on a range of sign languages; for work on ASL, see, for instance, Liddell (2003), Armstrong and Wilcox (2007), Dudis (2004), S. Wilcox (2004), P. Wilcox (2000), Janzen (1999, 2005), Shaffer (2004), Taub (2001), and Taub and Galvan (2001); for Swedish Sign Language (SSL), see Bergman and Wallin (1985) and Nilsson (2010); for DGS, see Perniss (2007); for Icelandic Sign Language, see Thorvaldsdottir (2007); for Irish Sign Language (Irish SL), see Leeson and Saeed (2007, 2012) and Leeson (2001); for French Sign Language (LSF), see Cuxac (2000), Sallandre (2007), and Risler (2007); and for Israeli Sign Language (Israeli SL), see Meir (1998).

3.2.2. Generative approaches to word order

In contrast, other accounts lean towards generative views on language. Fischer (1990), for instance, observes that both head-first and head-final structures appear in ASL and notes a clear relationship between definiteness and topicalisation. She also notes inconsistency in terms of head-ordering within all types of phrases and attempts to account for this pattern in terms of topicalisation: heads usually precede their complements except where complements are definite – in such cases, a complement can precede the head. This leads Fischer to claim that ASL is like Japanese in structure insofar as ASL allows for multiple topics to occur.

Similarly, Neidle et al. (2000) explore a wide range of clauses and noun phrases as used by ASL native signers within a generativist framework. They conclude (like Fischer and Liddell before them) that ASL has a basic hierarchical word order, which is SVO, basing their claims on the analysis of both naturalistic and elicited data. Working within a Minimalist Program perspective (Chomsky 1995), they state that derivations from this basic order can be explained in terms of movement operations, that is, they reflect derived orders. Neidle et al. make some very interesting descriptive claims for ASL: they argue that topics, tags, and pronominal right dislocations are not fundamental to the clause in ASL. They treat these constituents as being external to the clause (i.e. the Complementizer Phrase (CP) and argue that once such clause-external elements are identified, it becomes evident that the basic word order in ASL is SVO. For example, in (4a), the object has been moved from its post-verbal base position (indicated by ‘t’ for ‘trace’) to a sentence-initial topic position – the specifier of a Topic Phrase in their model – resulting in OSV order at the surface (Neidle et al. 2000, 50). Note that according to criterion (v) introduced in section 1.3 (pragmatic neutrality), example (4a) would probably not be considered basic either.

- | | | |
|-----|---|-------|
| | <u>top</u> | |
| (4) | a. JOHN _i , MARY LOVE t _i | [ASL] |
| | ‘John, Mary loves.’ | |
| | b. <i>pro</i> BOOK BUY IX _{3a} | [NGT] |
| | ‘He buys a book.’ | |

Along similar lines, the OVS order observed in the NGT example in (4b) is taken to be the result of two syntactic mechanisms: pronominal right dislocation of the subject pronoun (pronoun copy) accompanied by pro-drop (Perniss/Pfau/Steinbach 2007, 15).

Neidle et al. (2000) further argue that the distribution of syntactic non-manual markings (which spread over c-command domains) lends additional support for the existence of hierarchically organized constituents, thus further supporting their claim that the underlying word order of ASL is SVO. They conclude that previous claims that ASL utilised free word order are unfounded.

Another issue of concern first raised in the post-modern period and now gaining more attention in the age of typological research is that of modality, with the similarities and differences between sign languages attracting increased attention. Amongst other things, this period led to work on simultaneity in all its guises (see examples in (2) above), and some questioning of how this phenomenon impacted on descriptions

of basic word order (e.g., Brennan 1994; Miller 1994). Clearly, simultaneity is highly problematic for a framework that assumes that hierarchical structure is mapped onto linear order.

4. Towards a typology of sign languages

In today's climate, researchers are drawing on the results of work emanating from the modern and post-modern periods, consolidating knowledge and re-thinking theoretical assumptions with reference to cross-linguistic studies on aspects of syntax, semantics, and pragmatics (e.g., Perniss/Pfau/Steinbach 2007; Vermeerbergen/Leeson/Crasborn 2007).

In the late twentieth century and early twenty-first century, work has tended to be cross-linguistic in nature, considering the modality effects as a point of differentiation between spoken and sign languages. Moreover, studies sought to identify points that differentiate between sign languages, while also acknowledging the impact that articulation in the visual-spatial modality seems to have for sign languages, which leads to a certain level of similarity in certain areas. This phase of research maps onto Woll's third phase, that of 'typological research' and has led to a significant leap forward in terms of our understanding of the relationship between sign languages and the ways in which sign languages are structured.

4.1. Cross-linguistic comparison based on picture elicitation

Early work which we might consider as mapping onto a typological framework, and which still has relevance today, involves the picture elicitation tasks first used by Volterra et al. (1984) for LIS (see chapter 42, Data Collection, for details). This study, which focused on eliciting data to reflect transitive utterances has since been replicated for many sign languages including work by Boyes Braem et al. (1990) for Swiss-German Sign Language, Coerts (1994a,b) for NGT, Saeed, Sutton-Spence, and Leeson (2000) for Irish SL and BSL, Leeson (2001) for Irish SL, Sze (2003) for Hong Kong Sign Language (HKSL), Kimmelman (2011) for Russian Sign Language (RSL), and, more recently, comparative work on Australian Sign Language (Auslan), Flemish Sign Language (VGT), and Irish SL (Johnston et al. 2007) as well as on VGT and South African Sign Language (Vermeerbergen et al. 2007). These studies attempt to employ the same framework in their analysis of comparative word order patterning across sign languages, using the same set of sentence/story elicitation tasks, meant to elicit the same range of orders and strategies in the languages examined. Three kinds of declarative utterances were explored in particular: non-reversible sentences (i.e. where only one referent can be the possible Actor/Agent in the utterance; e.g. *The boy eats a piece of cake*), reversible sentences (i.e. where both referents could act as the semantic Agent; e.g. *The boy hugs his grandmother*), and locative sentences (these presented the positions of two referents relative to one another; e.g. *The cat sits on the chair*).

Unsurprisingly, results have been varied. For example, Italian subjects tended to mention the Agent first in their sentences while Swiss informants "tended to prefer to

set up what we have called a visual context with the utilisation of many typical sign language techniques such as spatial referencing, use of handshape proforms, role, etc.” (Boyes-Braem et al. 1990, 119). For many of the sign languages examined, it was found that reversibility of the situation could have an influence on word order in that reversible sentences favoured SVO order while SOV order was observed more often in non-reversible sentences; this appeared to be the case in, for instance, LIS (Volterra et al. 1984) and VGT (Vermeerbergen et al. 2007). In Auslan, Irish SL, and HKSL, however, reversibility was not found to influence word order (Johnston et al. 2007, Sze 2003). Moreover, results from many of these studies suggest that locative sentences favour a different word order, namely Ground – Figure – locative predicate, a pattern that is likely to be influenced by the visual modality of sign languages. A representative example from NGT is provided in (5) (Coerts 1994a, 65), but see (7) for an alternative structure.

- (5) TABLE BALL CL‘ball under the table’ [NGT]
 ‘The ball is under the table.’

Another study that made use of the same Volterra et al. elicitation materials is Vermeerbergen’s (1998) analysis of VGT. Using 14 subjects aged between 20 and 84 years, Vermeerbergen found that VGT exhibits systematic ordering of constituents in declarative utterances that contain two (reversible or non-reversible) arguments. What is notable in Vermeerbergen’s study is the clear definition of subject applied (work preceding Coerts (1994a,b) does not typically include definitions of terms used). Vermeerbergen interprets subject as a ‘psychological subject’, that is “the particular about whom/which knowledge is added will be called a subject”. Similarly, her references to object are based on a definition of object as “the constituent naming the referent affected by what is expressed by the verb (the action, condition)” (1998, 4). However, we should note that this is a ‘mixed’ pair of definitions: object is defined in terms of semantic role (Patient/Theme) while subject is given a pragmatic definition (something like topic).

Vermeerbergen found that SVO ordering occurred most frequently in her elicited data, although older informants tended to avoid this patterning. Analysing spontaneous data, with the aim of examining whether SVO and SOV occurred as systematically outside of her elicited data corpus, she found that actually only a small number of clauses contained verbs accompanied by explicit referents, particularly in clauses where two interacting animate referents were expressed. She notes that

Flemish signers seem to avoid combining one single verb and more than one of the interacting arguments. To this end, they may use mechanisms that clarify the relationship between the verb and the arguments while at the same time allowing for one of the arguments not to be overtly expressed (e.g. verb agreement, the use of both hands simultaneously, shifted attribution of expressive elements, etc.).
 (Vermeerbergen 1998, 2)

4.2. Semantic roles and animacy

Building on earlier studies, Coerts’ (1994a,b) work on NGT is one of the first attempts to explicitly list semantic roles as a mechanism that may influence argument relations.

Her objective was to determine whether or not NGT had a preferred constituent order. On this basis, she labelled argument positions for semantic function, including Agent, Positioner (the entity controlling a position), Zero (the entity primarily involved in a State), Patient, Recipient, Location, Direction, etc. Following Dik's Functional Grammar approach (Dik 1989), Coerts divided texts into clauses and extra-clausal constituents, where a clause was defined as any main or subordinate clause as generally described in traditional grammar.

Boyes-Braem et al. (1990) and Volterra et al. (1984) had identified what they referred to as 'split sentences', which Boyes-Braem describes as sentences that are broken into two parts, where "the first sentence in these utterances seem to function as 'setting up a visual context' for the action expressed in the second sentence" (Boyes-Braem et al. 1990, 116). A LIS utterance exemplifying this type of structure is provided in (6); the picture that elicited this utterance showed a woman combing a girl's hair (Volterra et al. 1984; note that the example is glossed in Italian in the original article).

- (6) CHILD SEATED, MOTHER COMB [LIS]
 'The child is seated, and the mother combs (her hair).'

Coerts (1994a) identified similar structures in her NGT data, and argues that these should be analysed as two separate clauses where the first clause functions as a 'Setting' for the second clause. Coerts found that most of the clauses she examined contained two-place predicates where the first argument slot (A1) was typically filled by the semantic Agent argument (in Action predicates), Positioner (in Position predicates), Process or Force (in Process predicates), or Zero (in State predicates). The second argument slot (A2) tended to be filled by the semantic Patient role (in Action, Position, and State predicates) or Direction/Source (in Action, Position, and Process predicates). First arguments were considered more central than second predicates given that "first arguments are the only semantic arguments in one place predicates. That is, semantically defined, there can be no Action without an Agent, no Position without a Positioner, etc., but there can be an Action without a Patient and also a Position without a Location et cetera" (Coerts 1994a, 53). For locative utterances, as in (7) below, the general pattern identified was A1 V/A2 (Coerts 1994a, 56). In this example, the first argument (CAR) is signed first, followed by a simultaneous construction with the verbal predicate signed by the right hand and the second argument (the location BRIDGE) by the left hand.

- (7) R: (2h)CAR _{3a}DRIVE-CL'car'_{3b} [NGT]
 L: BRIDGE ctr.up _____
 R: Agent Agent-Verb
 L: Loc
 A1 V/A2
 'The car goes under the bridge'.

This analytical approach mirrors work from the Functional and Cognitive Linguistics fields, which suggests a general tendency within word order across languages, claiming a natural link between form and meaning, with properties of meaning influencing and shaping form (e.g., Tomlin 1986). Of specific interest here is the Animated First Princi-

ple, whereby in basic transitive sentences, the most Agent-like element comes first. That is, there is a tendency for volitional actors to precede less active or less volitional participants. Coerts' findings and that of others have identified this principle for several sign languages (e.g., Boyes-Braem et al. 1990; Leeson 2001; Kimmelman 2011). Significantly, Coerts found that sentence type was relevant to discussion of constituent order in NGT. She writes that

From the analyses of the three sentence types, it emerges that the relation between the arguments in a clause can also be expressed by means of a verb inflection, classifier incorporation and lexical marking of the second argument and that the preferred constituent order can be influenced by semantic factors, especially the features Animate/Inanimate and Mobile/Immobile. (Coerts 1994a, 61)

The cross-linguistic study conducted by Saeed, Sutton-Spence and Leeson (2000), which compares BSL and Irish SL, builds on previous work by Volterra et al. (1984) and Coerts (1994a,b). This very small-scale study looked at a set of data elicited following the same elicitation procedure used by Volterra et al. (1984). Saeed, Sutton-Spence, and Leeson report finding the same types of structures as reported in studies on other sign languages that used the same elicitation materials and methodology, including split sentences, which they account for using Coerts' (1994a,b) implementation of a Functional Grammar framework. Despite such striking similarities across languages, Saeed, Sutton-Spence, and Leeson also report differences between BSL and Irish SL in terms of use of particular features. For example, different patterns emerged with respect to how signers of BSL and Irish SL used simultaneous constructions, with their use being more prevalent among the BSL informants. It was also found that BSL signers preferred to establish contextual information in greater detail than their Irish SL counterparts. Saeed, Sutton-Spence, and Leeson report that BSL and Irish SL seem to share a more similar underlying semantic pattern than suggested at syntactic level alone: they report a high degree of consistency in the relationship between animacy and focus in both languages. This was evidenced by the fact that the more animate entities tended to be signed by the dominant hand in simultaneous constructions, and Ground elements were introduced before Figure elements in locative constructions. Finally, the authors note that constituent order, particularly in relation to the use of devices like simultaneity, seems more fixed in the BSL data examined than in the Irish SL data.

4.3. Morphosyntactic and syntactic factors

Above, we have already seen that semantic factors such as reversibility and animacy can have an influence on word order in at least some sign languages. In addition, it has been found in a number of studies that morphosyntactic factors can also play a role. In particular, a different word order may be observed with verbs that carry certain morphological markers, such as agreement, classifiers, or aspect morphology. Chen Pichler (2001) subsumes the different types of markings under the term 're-ordering morphology'.

First, it has been observed that in some sign languages, plain verbs favour SVO order while agreeing (or indicating) verbs favour SOV order; this pattern has been

described for VGT (Vermeerbergen et al. 2007), LSB (de Quadros 1999), and Croatian Sign Language (HZJ, Milković/Bradarić-Jončić/Wilbur 2006), among others. Secondly, in many sign languages, classifier constructions behave differently with respect to word order; see, for instance, the simultaneous constructions involving classifiers in (2). Finally, verbs that are modified to express aspect (e.g. by means of reduplication) may appear in a different position. In ASL and RSL, for instance, aspectually modified verbs usually appear clause-finally while the basic word order is SVO (Chen Pichler 2001; Kimmelman 2011). With respect to the impact of re-ordering morphology, Chen Pichler (2008, 307) provides the examples in (8) from her corpus of acquisition data (both examples were produced by 26-months old girls). The verb in (8a) carries aspectual inflection, the verb in (8b) combines with a Handling classifier; both verbs appear sentence-finally.

- (8) a. CAT SEARCH_{aspect} [ASL]
 'I'm looking and looking for the cat.'
 b. HEY+ BAG INDEX_{bag} PICK-UP-by-handle
 'Hey (waving to get attention), pick up the bag.'

Returning to the question of basic word order, it could be argued that re-ordering morphology increases the morphological markedness of the verb. Hence, according to criterion (iv) in section 1.3, the alternative structures observed with morphologically marked verbs would not be considered basic.

Yet another phenomenon that complicates the identification of basic word order is doubling. We shall not discuss this phenomenon in detail but only point out that in many sign languages, verbs in particular are commonly doubled (see chapter 14, Sentence Types, for doubling of wh-words). If the resulting structure is SVOV, then it is not always possible to determine whether the basic structure is SVO or SOV, that is, which of the two instances of the verb should be considered as basic (see Kimmelman (2011) for an overview of factors potentially influencing word order in sign languages).

4.4. Summary: the impact of modality

One of the key questions underpinning recent work on word order is whether modality effects are responsible for the reduced range of structural variation found in sign languages in comparison to spoken languages. Perniss, Pfau, and Steinbach (2007, 14) note that variation in sign languages is most striking in the realm of syntax given that "the merging of a syntactic phrase structure is highly abstract and independent of phonological properties of the items to be inserted – no matter whether your theory involves movement operations or not".

The above discussion has made clear that sign languages differ from each other with respect to word order – and that, at least to some extent, they do so along similar lines as spoken languages do. In addition, a semantic or morphosyntactic factor that may have an influence on word order in one sign language does not necessarily have the same influence in another sign language. Still, we also find striking similarities across sign languages, and at least some of these similarities appear to be influenced by the modality (e.g. Ground-Figure order in locative sentences, simultaneous constructions).

5. Methodological issues: how data type impacts results

Finally, it is important to consider the role that data collection plays in the context of studies of word order in sign languages (also see chapter 42). Initially, it might be useful to note that a range of different types of data was utilised and this may have implications for the findings. For example, Coerts (1994a, 66f) urges caution in the interpretation of her results on NGT because the data she analysed was based on a set of sentences elicited in isolation. She notes that while the use of drawings is common practice in sign language research as they minimise the influence of spoken language, the elicitation drawings used in her study (like that of Volterra et al. 1984; Boyes-Braem et al. 1990; Vermeerbergen 1998; Johnston et al. 2007; and Saeed/Sutton-Spence/Leeson 2000) involved sets of two pictures which were minimally different, clearly contrastive with respect to one constituent. On this basis, she notes that potentially, these contrasts may have influenced the resulting linguistic encoding of sentences, involving constructions that mark contrast. In the same way, Liddell's early work on ASL was dependent on the translation of English sentences, which potentially allows for an increase in production of English-based or English-like constructions (Liddell 1980). In contrast, the work of Neidle et al. (2000) focussed only on native signers of ASL, and this is an important issue, as only 5–10 per cent of sign language users are 'native' insofar as they are born into Deaf families where a sign language is the primary language at home. For the remaining 90–95 per cent, we might expect that the patterns described by Neidle et al., while relevant, will not be reflected as consistently in their signing as they are in the productions of native signers. Consequently, the issue of frequency patterning as a key indicator of basic word order in a language (Brennan 1994) – and indeed, for grammar in general – remains unsolved in this instance.

Similarly, we can note that it is often difficult to compare the results of different studies in an unambiguous way. This is due to the fact that the range of data types varies across studies, with varying degrees of other influences on the expected target language output – be it the influence of a spoken language or the intrusion of contrastive constructions due to an informant's wish to be maximally comprehensive in their output. We must take into consideration the constraints that applied in the data collation of these studies and the impact this has on the reliability of the findings of these studies. Ultimately, we might argue that the most 'valid' results are those that compare and contrast constituent order across a range of data types, and we note that moves towards comparing and contrasting sign languages, backed up by access to multimodal data where annotations can be viewed relative to the source language data, enhances efforts towards identifying a true typology of sign languages (see Pizzuto/Pietrandrea (2001) for discussion of problems with glossing, for example). Indeed, we suggest that as linguists document more unrelated sign languages, thereby facilitating cross-linguistic studies based on a richer data set from a range of related and unrelated sign languages, our understanding of just how different sign languages are from each other will increase, allowing for a true typology of sign languages to unfold. The documentation of sign languages like LIU (Hendriks 2008), Adamorobe Sign Language (AdaSL, Nyst 2007), and the Al-Sayyid Bedouin Sign Language (ABSL, Kisch 2008; Sandler et al. 2005) adds to the pool of languages on the basis of which we may found a considered typology. We must bear in mind that some communities of sign language users are

larger and more robust than others (e.g., village sign languages versus national sign languages), a fact that has implications for language transmission and usage, which in turn has potential implications for all kinds of grammatical analysis, including word order (see chapter 24 on village (shared) sign languages).

Given the range of theoretical frameworks that have been adopted in considering word order in sign languages, it is practically impossible to compare and contrast findings across all studies: indeed, we refer the reader to Johnston et al.'s (2007) problematisation of cross-linguistic analyses of sign languages. What we can identify here is (i) the major thrust of the range of underlying approaches applied (e.g., descriptive, generative, functionalist, cognitive, semantic, typological); (ii) the languages considered; (iii) the methodologies applied; and (iv) the general period in which the work took place relative to Woll's three-way distinction. All this can assist in our interpretation of the data under analysis. For example, we have seen that some studies only focus on the semantic analysis of a narrow range of structures (e.g., agreement verbs, transitive utterances, passives, question structures) while others are more broadly based and offer general syntactic patterns for a given language (general valency operations for a language). This has been most notable for research on ASL and BSL, where (to generalise), the consensus seems to be that ASL is an SVO language while BSL is said to be a topic-comment language.

A final note on word order in sign languages must address the role that new technologies play. The development of software such as SignStream[®] and ELAN has allowed for significant strides forward in the development of digital corpora, and the analysis of such data promises to bring forth the potential for quantitative analyses as well as the opportunity for richer and more broadly based qualitative analyses than has been possible to date (see chapter 43, Transcription, for details). Digital corpus work for a range of sign languages including Auslan, BSL, Irish SL, LSF, NGT, VGT, and SSL is now underway. Neidle et al. (2000) employed SignStream[®] in their analysis of data, which allowed them to pinpoint the co-occurrence of non-manual features with manual features in a very precise way. Other syntactic work using SignStream[®] includes that of Cecchetto, Geraci, and Zucchi (2009). Similarly, work in ELAN has allowed for closer analysis of both the frequency of structures and the co-occurrence of structures, and promises to facilitate a quantum leap forward in terms of analysis and sharing of data. One of the main challenges is to ensure that the analysis of less well-supported sign languages is not left behind in this exciting digital period.

6. Conclusion

This chapter has provided a bird's eye view of key issues relating to word order and sign languages. Following Bouchard and Dubuisson (1995), we identified three aspects important to word order: (i) a functional aspect; (ii) an articulatory aspect; and (iii) the presumption of the existence of a basic word order. We outlined the relationship between signs and words before providing a historically-based survey of research on word order in sign languages, following Woll's (2003) identification of three important phases of research: the first concentrating on similarities between sign and spoken languages; the second focussing on the visual-gestural modality of sign languages; and

the third switching the emphasis to typological studies. We touched on the importance of such issues as non-manual features, simultaneity, and pragmatic processes like topicalisation and pointed out that the available studies on word order are embedded within different theoretical frameworks (including Functional Grammar, Cognitive Grammar, and Generative Grammar). We noted that over time, work on word order issues in sign languages has become more complex, as issues such as simultaneity, iconicity, and gesture in sign languages were included in the discussion. Similarly, as more and more unrelated sign languages are analysed, a more comprehensive picture of the relationship between sign languages and of the striking similarity of form and function at the non-manual level for certain structures (such as interrogatives) has emerged. However, we also noted that, due to the lack of a coherent approach to the description and analysis of data across sign languages, no clear claims regarding a typology of word order in sign languages can yet be made. Finally, we saw that new technologies promise to make the comparison of data within and across sign languages more reliable, and we predict that the age of digital corpora will offer new insights into the issue of word order in sign languages.

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13. The noun phrase

1. Introduction
2. Characteristics of this modality with consequence for noun phrase structure
3. What's in a noun phrase? A closer look inside
4. Number: expression of plurality
5. DP-internal word order
6. Conclusion
7. Literature

Abstract

This chapter considers, within the context of what is attested crosslinguistically, the structure of the noun phrase (NP) in American Sign Language (ASL). This includes discussion of the component parts of the noun phrase and the linear order in which they occur. The focus here is on certain consequences for the organization and properties of ASL noun phrases that follow from the possibilities afforded by the visual-gestural modality;