

The impact of verb type on word order in German Sign Language

DISSERTATION

zur Erlangung des philosophischen Doktorgrades

an der Philosophischen Fakultät der

Georg-August-Universität Göttingen

vorgelegt von

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Göttingen 2020

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Datum der Einreichung: 04.12.2020

Datum der mündlichen Prüfung: 17.12.2021

Acknowledgments

The first time I got in contact with German Sign Language was during my bachelor studies of German philology at the University of Goettingen. Just out of curiosity, I took a seminar about the grammar of DGS although I had no prior knowledge about sign languages in general. Since then, I have gotten more and more involved in the linguistic study of this fascinating language and I am grateful that Roland Metz, Annette Flemnitz, Liona Paulus and Thomas Finkbeiner showed and taught me DGS. I would have never started this PhD journey if I had not been given the chance to work as a student assistant in the Sign Team Goettingen. I want to express my deepest thanks to Markus Steinbach, Annika Herrmann and Nina-Kristin Pendzich and the other former and current members of the team for the experiences I have gained since the beginning of my studies.

First and foremost, I would like to thank my advisor Markus Steinbach for his support and guidance throughout the whole stages of my PhD. I am thankful for his time, knowledge and encouraging meetings, which always opened new perspectives regarding the analysis of data and the process of writing. Annika Herrmann was a constant help and her motivation and enthusiasm always encouraged me doing research. I am especially grateful for her knowledge while planning my dissertation and for her helpful feedback during the different phases of my project. In addition, I very much appreciated the support of Jana Hosemann whose knowledge and experience concerning experimental research was a great benefit for me. Furthermore, I would like to thank Nina-Kristin Pendzich that she shared her experimental experience with me, especially regarding the research design presented in this dissertation. Special thanks go to our student assistants Mareike Anhalt, Rieke Giese and Dorothee Nyga. I want to thank Mareike that she cut and edited the videos used in the experimental study and I am especially thankful for the help of Rieke who carried out the study with the first four participants on her own when I was suddenly not able to support her. I would like to thank Doro as well for supporting me during data annotation. Additionally, I am grateful for the time that Alexander Syring spent in showing and helping me programming the experiment. Furthermore, the research for this dissertation was partly funded by the Horizon 2020 project of the European Union “The Sign Hub: Preserving, Researching and Fostering the Linguistic, Historical and Cultural Heritage of European Deaf Signing Communities with an Integral Resource” and it would not have been possible without the Deaf informants and participants who shared their knowledge of DGS with me. Thus, I am finally very grateful for the time and effort they spent for taking part in my research. DANK++

Moreover, I thank my colleagues of the Sign Team and the German Linguistic Department in Goettingen for their support and help regarding teaching and research and I always enjoyed the nice discussions and conversations during coffee breaks. My special thanks go to my colleague Elisabeth Volk who became a close friend since we first met. It was just a lucky coincidence that we both chose the same study programs. We quickly recognized that we share the same interests, which led us to follow the same academic path. I was very lucky to work with her and I am very glad that we were such good collaborating partners. I am so thankful for the time we spent together during seminars, lectures and coffee breaks and I really enjoyed and loved our discussions about university, work and life beyond. In addition to Eli, I would like to thank my former colleague Derya Nuhbalaoglu. I really enjoyed our discussions about research and data and her enthusiasm always inspired me to look at it from different angles. I am glad for the time when we both worked together in the Sign-Hub project. Even the longest days in the lab were always funny with her. Besides being such a motivating colleague and friend, I would like to thank Derya, Sabrina Höling and Nicole Losekam for their time and effort they spent while reading drafts of this dissertation despite their busy work schedules. They provided me with constant feedback, motivating words and insightful comments which helped me a lot to structure and finalize my work and which I appreciated a lot. Furthermore, I am very happy to have such good friends who always found the right words to motivate and to encourage me to continue this PhD journey.

Last but not least, I deeply thank my family and my husband for their love, support and patience at any times. My parents and my sister have always encouraged me and I would like to thank them for their financial and moral support during the whole time. Finally, I am endlessly grateful for my husband and the last fifteen years we shared with each other. I love you, Benedikt and Jonathan and I am looking forward to the next years to come with all of you being by my side.

Summary

Word order is one of the best studied and most discussed issues in spoken and sign language linguistics. Therefore, it is stunning that there is yet no broader empirical investigation of word order phenomena in German Sign Language (DGS). Hence, this dissertation aims to fill parts of this gap and presents the first thorough empirical study of basic word order and word order variation in DGS by using a newly version of a Sentence Reproduction Task (SRT). In this study, 22 native and near-native DGS signers saw recorded DGS conversations containing manipulated sentences (according to verb position and verb type) which had to be memorized and repeated. The aim was to test the influence of verb type on the structure of basic, unmarked, declarative clauses in DGS. Research in several typological unrelated sign languages (Johnston et al. 2007; Kimmelman 2012; Milković, Bradarić-Jončić & Wilbur 2006; Pavlič 2016a) has shown that among morphosyntactic, semantic and pragmatic factors, verb type is one of the aspects that might influence clause structure and which has not yet been tested for DGS. In sign languages, verbs are differentiated whether they spatially exploit the signing space or not. On the one hand, agreement and spatial verbs change their movement and direction in space based on properties of the verbal arguments; on the other hand, plain verbs cannot undergo such changes. It is hypothesized that agreement and spatial verbs favor verb-final clause structures (OV) in DGS, whereas plain verbs, however, tend to be used in clauses with objects following the verb (VO). It is further assumed that agreement marking and word order interact in DGS (Oomen 2020). Accordingly, next to different frameworks and approaches of agreement and word order theory in spoken and sign languages, this dissertation discusses recent theoretical accounts of DGS which offer an agreement analysis supposing that all verb types take part in the agreement process (Oomen 2020; Oomen & Kimmelman 2019; Pfau, Salzmann & Steinbach 2018) or argue for differential object marking and object shift in DGS (Börstell 2019; Bross 2020a; Bross 2020b). The results of the presented SRT study show that (S)OV is the most frequent word order (64.7%) followed by (S)VO (12.6%), SV (12.2%) and other orders (10.5%) supporting claims that DGS is a verb-final language. They further confirm that clause structure is affected by verb type since agreement verbs, spatial verbs and verbs involving handling classifier handshapes occur with OV order, whereas (body-anchored) plain verbs appear with VO order. Moreover, clause structure and agreement marking interact since modified agreement verbs predominantly occur with OV structure, while VO structure is used when agreement modification is missing. Clauses that involve the agreement marker PAM (Rathmann 2003) predominantly show SOV order. PAM is mainly found with modified

agreement verbs and is placed preverbally before an animate object. In addition, argument omission frequently occurs but is less observed with VO order. The results presented in this dissertation are thus in accordance with recent presented claims made by Oomen (2020) such as to distinguish separately between plain verbs articulated on or near the body (body-anchored plain verbs) and verbs articulated in the neutral signing space (neutral plain verbs) as well as recent arguments that PAM is a differential object marker in DGS (Bross 2020b).

German summary (Zusammenfassung)

Wortstellung ist eines der Themen, die innerhalb der Lautsprach- und Gebärdensprachlinguistik am besten untersucht und am meisten diskutiert werden. Daher ist es umso erstaunlicher, dass es für die Deutsche Gebärdensprache (DGS) bislang noch keine umfassenderen empirischen Studien dazu gibt. Diese Dissertation versucht Teile dieser Lücke zu schließen und stellt die erste systematische empirische Untersuchung zu Wortstellungsvariationen in DGS vor. Mit Hilfe einer modifizierten Satz wiederholungsaufgabe („Sentence Reproduction Task“; SRT) wird der Einfluss des Verbtyps auf einfache, unmarkierte Deklarativsätze in DGS getestet. 22 DGS Muttersprachler*innen wurden dazu zuvor aufgezeichnete DGS-Gespräche präsentiert, wobei bestimmte manipulierte Sätze (bezogen auf Verbposition und Verbtyp) von den Proband*innen in Erinnerung behalten und nach gewisser Zeit wiederholt werden mussten. Bislang gibt es keine Studien, die den Verbtyp als Einflussfaktor auf die Wortstellung in DGS untersuchen, obwohl Studien aus anderen typologisch, nicht miteinander verwandten Gebärdensprachen (Johnston et al. 2007; Kimmelman 2012; Milković, Bradarić-Jončić & Wilbur 2006; Pavlič 2016a) gezeigt haben, dass Verbtyp neben anderen morphosyntaktischen, semantischen und pragmatischen Faktoren Einfluss auf die Wortstellung nimmt. Verben werden in Gebärdensprachen dahingehend unterschieden, ob und inwiefern sie den Gebärdenraum räumlich ausnutzen. Einerseits kann die Bewegung und/oder Richtung im Raum bei sogenannten Kongruenz- und Raumverben basierend auf den Eigenschaften der verbalen Argumente verändert werden, andererseits findet eine solche Veränderung bei sogenannten einfachen Verben nicht statt. Es wird angenommen, dass Kongruenz- und Raumverben mit verb-finaler Wortstellung einhergehen (OV), während bei einfachen Verben das Verb vor dem Objekt steht (VO). Ferner wird angenommen, dass Kongruenzmarkierung und Wortstellung in DGS miteinander interagieren (Oomen 2020). Neben verschiedenen Ansätzen zu Kongruenz und Wortstellung in Laut- und Gebärdensprachen werden in dieser Dissertation aktuelle Theorien zur DGS erörtert, die einerseits davon ausgehen, dass alle Verbtypen Kongruenz markieren (Oomen 2020; Oomen & Kimmelman 2019; Pfau, Salzmann & Steinbach 2018) oder andererseits argumentieren, dass in DGS eine differenzielle Objektmarkierung zu finden ist (Börstell 2019; Bross 2020a; Bross 2020b). Die Ergebnisse der vorliegenden SRT-Studie zeigen, dass (S)OV die am häufigsten vorkommende Wortstellung (64,7%) gefolgt von (S)VO (12,6%), SV (12,2%) und anderen Wortstellungen (10,5%) ist, sodass die Annahme gestützt wird, dass es sich bei DGS um eine verb-finale Sprache handelt. Die Ergebnisse bestätigen weiterhin, dass der Verbtyp

die Wortstellung beeinflusst, da Kongruenz- und Raumverben sowie Verben, die eine Klassifikatorhandform verwenden, vorwiegend mit OV-Stellung auftreten, während (körpergebundene) einfache Verben mit VO-Stellung vorkommen. Darüber hinaus zeigen die Ergebnisse, dass Wortstellung und Kongruenzmarkierung miteinander interagieren. Modifizierte Kongruenzverben weisen überwiegend eine OV-Stellung auf, wohingegen bei fehlender Kongruenzmarkierung der Verben VO-Stellung verwendet wird. Sätze, die den Kongruenzmarker PAM (Rathmann 2003) beinhalten, weisen hauptsächlich SOV-Stellung auf. PAM wird vorwiegend mit modifizierten Kongruenzverben verwendet und vor belebten Objekten positioniert. Zudem können Argumente häufig ausgelassen werden, was jedoch bei VO-Stellung weniger beobachtet wird. Die in dieser Dissertation vorgestellten Ergebnisse stimmen daher unter anderem mit den kürzlich von Oomen (2020) vorgebrachten Behauptungen überein, dass einfache Verben, die am oder in der Nähe des Körpers ausgeführt werden (körpergebundene einfache Verben), gesondert von Verben, die im neutralen Gebärdenraum artikuliert werden (neutrale Verben), betrachtet werden sollten. Des Weiteren liefert die Dissertation weitere Argumente dafür, dass PAM ein differenzieller Objektmarker in DGS ist (Bross 2020b).

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Notational conventions

As it is common practice in sign language linguistics, signs that are manually produced with the hands are represented as glosses by using small caps. While manual signs are represented linearly, non-manual elements produced with the face and/or torso appear above the glosses as abbreviations indicated by a line that signals the scope of the non-manual element. The conventions for manual and non-manual elements used in this dissertation are listed below.

SIGN	Manual signs are glossed in small caps using the English word irrespective of the described sign language.
SIGN-SIGN	If words are connected with a hyphen, it describes one single sign, which is expressed by several English words such as LOOK-FOR.
S-I-G-N	A gloss that is separated by hyphens corresponds to a fingerspelled sign.
SIGN++	++ marks the sign as reduplicated for instance to signal plural marking.
SIGN#SIGN	Signs connected with # refer to compounds.
IX _{1,2,3a,3b}	IX are pronominal pointing signs where the indices specify the locations of the referent. 1 refers to the signer, 2 refers to the addressee and 3a and 3b correspond to referents located on the ipsi- or contralateral side of the signing space. If IX _{pl} is used, it refers to a first, second or third plural referent.
IX _{1pl...}	
POSS _{1,2,3a,3b}	POSS are possessive pronouns and the indices refer to the referents as described for pronominal pointing signs.
IX _{loc}	Pointing sign that has a locative function.
IX _{dem}	Pointing sign that has a demonstrative function.
_{1,2,3a,3b} VERB _{1,2,3a,3b}	Verb sign that moves in the signing space from one location to another location and the indices specify the location as described above for pronominal pointing signs.
VERB _{cl}	Verb sign that is used with a classifier handshake.
PAM	Person agreement marker which can be used with indices (such as _{3a} PAM _{3b}) to indicate that PAM moves across locations.
RPRO-H	A relative pronoun that refers to a human

h1/h2	If listed separately, signs articulated with the dominant hand are marked as h1 as one line and signs produced with the non-dominant hand are marked as h2.
SIGN-----	A sign that is hold on the one hand while another sign is produced on the other hand.
SIGN,	A comma after a sign signals a short pause
g-xx	g- refers to a gesture where xx describes the way the gesture looks like.
g-pu	Palm-up gesture
<u>top</u> SIGN	Topicalized constituent
<u>hs</u> SIGN	Headshake
<u>br</u> SIGN	Brow raise
<u>bf</u> SIGN	Brow furrow
<u>eg</u> SIGN	Eye gaze
<u>ht</u> SIGN	Head tilt; ht-right corresponds to a head tilt to the right, ht-left refers to a head tilt to the left and ht-b indicates that the head is tilted back.
<u>lip</u> SIGN	Drawn lips
<u>bl-b</u> SIGN	Body lean back
<u>sq</u> SIGN	Squinted eyes
<u>gebärde</u> SIGN	Mouthing accompanying a sign

List of sign languages

ABSL	Al-Sayyid Bedouin Sign Language
ASL	American Sign Language
Auslan	Australian Sign Language
BSL	British Sign Language
DGS	German Sign Language (<i>Deutsche Gebärdensprache</i>)
DSGS	Swiss German Sign Language (<i>Deutschscheizerische Gebärdensprache</i>)
DSL	Danish Sign Language
FinSL	Finnish Sign Language
GSL	Greek Sign Language
HKSL	Hong Kong Sign Language
HZJ	Croatian Sign Language (<i>Hrvatski Znakovni Jezik</i>)
Irish SL	Irish Sign Language
ISL	Israeli Sign Language
KQSL	Kafr Qasem Sign Language
Libras	Brazilian Sign Language (<i>Lingua Brasileira de Sinais</i>)
LIS	Italian Sign Language (<i>Lingua dei Segni Italiana</i>)
LIU	Jordanian Sign Language (<i>Lughat al-Ishāra al-Urdunia</i>)
LSE	Spanish Sign Language (<i>Lengua de Signos Española</i>)
LSF	French Sign Language (<i>Langue des Signes Française</i>)
LSF-SR	Swiss-French Sign Language (<i>Langue des Signes Suisse romande</i>)
LSQ	Quebec Sign Language (<i>Langue des Signes Québécoise</i>)
NGT	Sign Language of the Netherlands (<i>Nederlandse Gebarentaal</i>)
NSL	Norwegian Sign Language
ÖGS	Austrian Sign Language (<i>Österreichische Gebärdensprache</i>)
PJM	Polish Sign Language (<i>Polski Język Migowy</i>)
RSL	Russian Sign Language
SASL	South African Sign Language
SSL	Swedish Sign Language
SZJ	Slovenian Sign Language (<i>Slovenski Znakovni Jezik</i>)
VGT	Flemish Sign Language (<i>Vlaamse Gebarentaal</i>)

1 Introduction

One of the central and most discussed questions in syntactic research is how syntactic elements (words, signs, constituents) are linearly ordered. At clausal level, this concerns the position of subject, object and the verb, which has been referred to as the basic word order of a language. The starting point of typological word order research in spoken languages is usually connected to the influential work by Greenberg (1963) who investigated and classified 30 unrelated languages as belonging to a particular word order type. He found that SOV (43%) and SVO (37%) are the most widely attested word orders across languages, stated that subjects generally precede objects and discovered that languages of the same basic word order type share some ordering properties of other elements in the clause. For instance, he observed that adpositions mainly follow their nouns in OV languages, whereas they precede nouns in VO languages (see section 3.1.1.3 for a description of further correlation pairs). Since then, researcher started investigating basic word order of a given language as one of the first issues to look at when describing the syntax of a language. Consequently, typological orientated syntactic research based on a larger sample of languages is interested in the way different principles interact and correlate with each other and tries to figure out how strong these correlations are and how they could be theoretically explained. Other mainly generative orientated approaches, instead, seek for grammatical mechanisms, which are thought as language universal and see word order as byproduct of these (see section 4.1 for a theoretical overview).

Word order typology and the associated correlations with it were mainly studied based on spoken languages and sign languages were considered much later in syntactic typological research and other frameworks. Sign languages are natural full-fledged human languages, which are visually perceived and produced with hands, torso, face and the head. Their systematic investigation started around 1950 (Stokoe 1960; van Tervoort 1953) and since the beginning of sign language research, word order has been one of the first phenomena scholars were interested in (Fischer 1975; Friedman 1976; Liddell 1980). One central question is whether modality has an impact on word order. Researchers working within a generative approach showed that sign languages share the same underlying grammatical principles as spoken languages and identified the same syntactic hierarchical structures such as verb phrases. On the other hand, it is emphasized that the gestural origin of signs and the visual modality within they are produced and perceived have to be taken into account while studying word order. In particular, word order variation in sign languages is highly connected with the distinction of verb types and the phenomenon of verb agreement, which shows

some modality specific properties. For instance, verb agreement is only observed with some kind of verbs, which further show different word order properties compared to the other verb types. Hence, word order, verb type distinction and agreement belong to the most well researched aspects of sign languages¹.

The aim of this dissertation is to provide new empirical data on basic word order and word order variations of German Sign Language (*Deutsche Gebärdensprache*, DGS) which is the natural language of the Deaf Community in Germany, Luxembourg and parts of Belgium. DGS is considered a SOV language, but so far, there has been no broader empirical investigation of word order in DGS and no study addressed possible influencing factors such as verb type, agreement marking or classifier handshapes on basic word order. Research on DGS focused mainly on the description of agreement properties and the classifier system of DGS and is primarily found in grammatical textbooks (Eichmann, Hansen & Heßmann 2012; Happ & Vorköper 2006; Papispyrou et al. 2008) or published in selected articles (see for instance Glück & Pfau (1998); Hänel (2005b); Perniss (2007); Rathmann & Mathur (2002) and Rathmann & Mathur (2008)) but is not offered in form of a comprehensive reference grammar targeting these aspects. There are a few empirical investigations of verb agreement such as the studies based on event-related potential (ERP) measurements by Hosemann et al. (2018) or Hänel-Faulhaber et al. (2014), but other empirical methods such as corpus studies are still missing (but see Oomen (2020)). The DGS corpus (Hanke et al. 2020) developed at the university of Hamburg offers a suitable source for studying agreement or other syntactic phenomena but faces the problem that it still lacks morphosyntactic annotations and so far, provides only basic annotations on the lexical level. However, Oomen (2020) recently investigated verb types in DGS based on a small sample of verbs selected from the DGS corpus. Other empirical investigations of syntactic phenomena of DGS using methods such as questionnaire studies or production data are still limited (but see for instance Murmann (2012)). Hence, this dissertation wants to complement this picture and presents a study, which investigates the morphosyntactic influence of verb type on word order in DGS by using a Sentence Reproduction Task (SRT), which has been not used so far for investigating syntactic variation.

¹ Besides that, classifiers (Supalla 1986), interrogatives (Zeshan 2006) and role-shift (Lillo-Martin 2012) are also phenomena which are well studied in sign languages.

1.1 Research questions and aim of the dissertation

The main goal of this dissertation is to describe the basic word order used in unmarked (or neutral) declarative main clauses in DGS and its interaction with verb types and agreement marking. As mentioned above, basic word order is defined as the order of the verb and its arguments (subject and object) which will be the focus of the presented work. Other related word order phenomena such as the order within a noun phrase, word order changes in sentence types or embedded sentences will only be discussed when relevant. Although those aspects clearly interact with each other, the question of basic order based on neutral declarative main clauses has to be addressed as the first step before studying any further interaction. However, aspects that will be relevant such as information-structural notions like topic and focus and movement operations such as topicalization will be discussed peripherally when necessary. This dissertation provides the first comprehensive empirical investigation about the order of verbs and their arguments in DGS. Thus, one of the main research questions guiding this dissertation is the following:

- What is the position of the verb and its arguments in a declarative main clause in DGS?

Sign languages have different verb types which show different agreement properties. Plain verbs do not change their phonological form and do not express agreement with their arguments, while the form of spatial and agreement verbs changes depending on the properties of the arguments they agree with. Research on word order in sign languages showed that verb type, especially the difference between plain and agreement verbs, is crucial for clause structure (de Quadros 1999). Plain verbs tend to precede the object, whereas agreement verbs are more likely to be positioned following the object. This and other influencing factors have not been yet empirically investigated for DGS. On the one hand, Rathmann & Mathur (2008) claim that word order in DGS is not affected by the presence of an agreement verb. On the other hand, a recent corpus study by Oomen (2020) found a difference in clause structure between body-anchored plain verbs and agreement verbs in DGS. Thus, this dissertation in particular examines verb type as one possible factor that might affect basic word order. Hence, the following research questions are further relevant for this dissertation:

- Is word order influenced by verb type?
- Does clause structure differ when containing plain or agreement verbs?

- Does the presence of modification of an agreement verb affect basic word order?

Another interesting property of many different sign languages is that they have specific agreement markers (or agreement auxiliaries) in addition to agreement verbs. In Rathmann (2003), it is argued that sign languages which have agreement auxiliaries such as the person agreement marker PAM in DGS exhibit a relatively free word order. Traditionally, PAM is considered as an agreement auxiliary which expresses agreement with subject and object in the case of plain verbs (Steinbach 2011; Pfau, Salzmann & Steinbach 2018; Steinbach & Pfau 2007). Nevertheless, see more on PAM and a contradicting view of its use as an agreement auxiliary in section 6.4.2. Furthermore, the position of PAM might be dialectal restricted such that signers place it either in clause-final position or in clause-internal position usually preceding the object (Bross 2020b; Macht 2016; Macht & Steinbach 2019). In general, sign languages without agreement markers such as American Sign Language (ASL) are usually SVO languages, whereas sign languages such as DGS with agreement markers seem to have a more flexible word order but show a preference for SOV order. Thus, additional research questions are the following:

- What is the position of PAM in DGS?
- Is word order in DGS affected due to the presence of PAM?

Basic word order and possible verb type influences are tested by using the method of a Sentence Reproduction Task (SRT). In such tasks, participants have to memorize and reproduce a previous known sentence, which usually increases in length and grammatical complexity. In its original use it serves as a widely used method in psycholinguistic and language acquisition research, but it has not been used much for eliciting other grammatical aspects of language usage so far (but see Kubus et al. (2018), Mpadanes et al. (2018) and Pendzich et al. (2022) as well as Pendzich, Hermann & Steinbach (2019)). Thus, I will finally present the structure and design of a modified SRT used for studying syntactic phenomena in sign languages and will show how it can be applied for testing word order variations in DGS.

1.2 Outline of the dissertation

This dissertation is organized in eight chapters. In chapter 2, I will give a short introduction to the linguistic structure of DGS. I will start with summarizing some characteristics of the sociolinguistic and acquisition situation of DGS since these aspects influence empirical

research in general and data collection and evaluation in particular. In addition, I will give a short overview of the academic research situation of DGS in Germany. Further, I will describe the main grammatical properties of DGS, but I will limit the description to the morphosyntactic level. This includes a note on simultaneity in sign languages, a basic description of the grammatical use of space and a short introduction into the verbal agreement and classifier system of DGS. This will be followed by a brief overview of clause structure, in which I will describe the position of elements such as modals and negatives, order in other types of sentences such as interrogatives and the structure of main and embedded clauses.

In chapter 3, I will present the descriptive and empirical background on word order and agreement in spoken and sign languages. In the first part of chapter 3, the definition of word order, factors influencing word order and typological observed word order correlations based on spoken and sign languages will be discussed. I will start with a discussion of word order research of spoken languages. Here, I will elaborate on the issue of defining and classifying word order types in general and I will illustrate how different (theoretical) criteria lead to diverging word order classifications of German word order in particular. Furthermore, I will show how morphosyntactic, semantic and discourse-related factors influence word order in spoken languages and especially order in the German middlefield. In addition, I will review typological research concerning the correlation of object and verb with other elements in the clause. Moving on with word order in sign languages, I will review the main controversial aspects and findings of word order studies in sign languages. I will discuss whether sign languages have a basic word order and whether order is syntactically or pragmatically determined. I will further report on factors that have been claimed to affect word order and I will show that they are similar to those described for spoken languages. Moreover, typological tendencies that have been observed across sign languages will be reviewed. In the second part of chapter 3, I will introduce the phenomenon of (verb) agreement in spoken and sign languages. Based on spoken languages, I will define the basic terms of agreement and I will illustrate common agreement properties and involved features. This section further includes a short note on differential object marking in spoken languages. In the following section, I will describe the process of verb agreement in sign languages and discuss why the applicability of the term agreement to the phenomenon observed in sign languages has been a matter of debate. This concerns the (gestural) use of space, the definition of verb types, the use of agreement markers, the primacy of object marking and the optionality of agreement marking.

Chapter 4 presents theoretical approaches to word order and agreement in spoken and sign languages. In the first part of chapter 4, I will present how word order is dealt within three selected theoretical frameworks: Typology, Generative Grammar and Optimality Theory. The importance of word order and its theoretical implementation differs strikingly in those approaches and I will generally describe and contrast their views and procedures. This will be followed by a discussion of word order theories proposed for sign languages subsumed under i) gestural, ii) functional and cognitive and iii) generative approaches. Those papers describe word order variation in sign languages as a pressure coming from the visual modality (i), as an interplay of clause structure with modality specific language internal factors such as constructed action as well as language external influences such as spoken language influence (ii), or as a result of universal language principles and syntactic hierarchical structures (iii). The second part of chapter 4 will present theoretical frameworks of agreement developed for spoken and sign languages. I will outline how agreement is defined and modelled within the typological approach and the Minimalist Program based on spoken languages. Both frameworks have influenced theories of verb agreement in sign languages, which I will present thereafter. I will give an overview of gestural, thematic and generative agreement accounts in sign languages that differ whether they include gestural, semantic or syntactic principles into their analysis of agreement. I will focus on the generative approaches since these will guide the analysis of the following presented study on word order in DGS.

Chapter 2-4 present the descriptive and theoretical part, whereas chapter 5-7 will provide the empirical part of my dissertation. In chapter 5, I will start with a discussion of critical methodological points of word order research in general and of word order studies in sign languages in particular. Furthermore, I will give an overview of studies investigating the order of subject, object and verb in sign languages. This will be followed by a presentation of the Sentence Reproduction Task carried out for this dissertation, which investigates the interaction of verb type and word order in DGS. I will describe the research design and procedure of the study and will provide frequency analysis based on single verb types. I will show how word order differs according to verb type, how word order is connected to the presence and absence of agreement marking in DGS and I will comment on the position of the agreement marker PAM. Those findings will be discussed in chapter 6 and explained within current analyses proposed for sign languages. In chapter 7, I will compare the findings of my research with recent proposed accounts for DGS and I will discuss the implications for clause structure in DGS. In the final chapter 8, I will summarize the main findings of this dissertation, will report on methodological and theoretical challenges and will offer suggestions for future research.

2 The linguistic structure of DGS

Human languages can be produced and perceived by using two different modalities: spoken languages are expressed via the oral-aural modality, whereas sign languages use the visual-gestural modality. Sign languages are visually perceived languages and use manual, the hands and the arms, and non-manual components such as the torso, the head and the face for production. They are full-fledged, natural languages with own complex grammars at all levels (phonology, morphology, syntax and semantics) and show grammatical structures independent of the surrounding spoken languages. The linguistic research of sign languages showed that spoken and sign languages share many grammatical properties such as syntactic principles for word order, which will be the focus of this dissertation. However, the use of different modalities has consequences for the linguistic structure of other grammatical phenomena such as verb agreement which is a controversially debated issue in sign languages (more on agreement in sign languages in section 3.2.2 and see also Aronoff, Meir & Sandler (2005) and Meier (2002; 2012) for an overview of the interaction of language and modality).

In this section, I will firstly shortly comment on the sociolinguistic aspects of the Deaf community in Germany since the observed heterogeneity affects the study of any grammatical properties in general and will be further relevant for the design and evaluation of the empirical study presented later. Furthermore, I will briefly summarize the institutional setting of the academic research situation of DGS. Secondly, I will give an overview of the grammatical properties of DGS, but I will limit my description to the level of morphosyntax and the concepts relevant for this dissertation.

2.1 Sociolinguistic aspects

It is widely acknowledged that sign languages show a lot of sociolinguistic variation and that Deaf communities are quite heterogeneous which might impact linguistic data and research in general (Quer & Steinbach 2019; Schembri & Johnston 2012). In this section, I will outline how the language acquisition and transmission situation, the historical and educational background, the lack of standardization and the political status contribute to the heterogeneity and variation observed in DGS.

Only 5-10% of deaf children are born to deaf parents and can be considered native signers; thus, presenting a very small group within the Deaf community. These children grow up in families with sufficient and adequate sign language input from birth and acquire the respective sign language as L1. In contrast, the vast majority of deaf babies is born into

hearing families without an adequate access to sign language. These children are usually raised in a spoken dominant environment for the first years of their lives. Only few parents start learning sign language or are in general capable of providing enough sign language input to nurture the development of a natural language competency. More often, children will be provided with cochlear implants which allow them access to spoken language after intensive speech training (Quer & Steinbach 2019). If not implanted, the first exposure for deaf children with hearing parents to DGS usually starts when attending a bilingual/deaf kindergarten or school. However, most teachers in kindergarten or school are hearing second language learners and only a few teachers are deaf and serve as signing role models for these children. Furthermore, it cannot be taken for granted that DGS is taught in deaf schools. Moreover, combined and mixed forms of signing and spoken language are the primary way of communicating. This is because Germany faces a long history and tradition of oralism. Pedagogy and education were mainly focused on spoken language input, acquisition and assessment and therefore enhancement of speech and articulation training and lip reading were the most important goals (Borgwardt 2016; Paulus 2019; Plaza-Pust 2012; Vogel 2016). An important factor for sign language acquisition for deaf children is thus the contact with deaf peers in school, deaf associations or deaf clubs, in which contexts are established that make DGS acquisition and preservation possible. Deaf schools and clubs are geographically wide spread and are not centralized to a specific area within Germany (Boyes-Braem & Rathmann 2010; Paulus 2019). The existence of dialectal variation is usually seen as a consequence of the regional distribution of deaf schools (Eichmann & Rosenstock 2014). In addition to the geographically spreading and the development of DGS in the context of deaf schools, the lack of standardization and a missing writing system contribute to the high degree of variation observed in DGS. Dialectal variation is mainly found in the lexicon especially regarding signs for weekdays, month, colors and kinship terms and on other grammatical levels such as the syntactic positions of functional markers (Hanke et al. 2017; Hillenmeyer & Tilmann 2012; Langer 2018; Langer et al. 2012) (and see the discussion of PAM in section 6.4.2 and also Macht & Steinbach (2019)). Figure 1 - figure 4 show four different variants of the sign for NOVEMBER found in the DGS corpus (Hanke et al. 2020) which differ in their phonological form but also show distributional variation. Whereas *variant a* is used all across Germany, *variants b, c* and *d* are tied to specific regional areas in Germany (Langer 2018).



Figure 1: Variant a of NOVEMBER



Figure 2: Variant b of NOVEMBER



Figure 3: Variant c of NOVEMBER



Figure 4: Variant d of NOVEMBER

Grammatical variation concerns for instance the use and position of the sign BEEN ('gewesen') which can be used as an expression of place in general as in (1)a) or as a marker for past tense (1)b) (Hillenmeyer & Tilmann 2012: 255). However, the latter use seems to be restricted to Northern dialects of DGS. Furthermore, BEEN is either positioned sentence-finally or appears following the subject (Happ & Vorköper 2006; Hillenmeyer & Tilmann 2012; Papaspyrou et al. 2008).

- (1) [DGS]
- a. LONDON IX₁ BEEN
'I was in London.'
- b. IX₁ POSS₁ FRIEND_{3a} VISIT_{3a} BEEN
'I visited my friend.'

Up to date, none of the observed varieties of DGS serves as a standard variety since none of these varieties has been codified or documented in some kind of reference body (e.g. dictionaries or reference grammar, see also the next section 2.2). Furthermore, politically motivated language planning activities in order to establish a standardization of DGS are usually regarded with skepticism by deaf signers since such attempts mainly fulfill needs of hearing sign language users (Eichmann 2009; Eichmann 2013). Although signers are confronted with a lack of standardization, they can identify several linguistic and paralinguistic parameters which they relate to authentic DGS signing such as the speed of signing, the size of signing vocabulary or the use of mimic expressions (Jaeger 2019). On the political level, sign languages have long been neglected and the use of signs has been oppressed and marginalized. Still, many countries do not officially recognize sign languages as independent languages (Schermer 2012). DGS has been officially recognized in 2002 as part of the Disability Discrimination Act (Behindertengleichstellungsgesetz, BGG §9) which guarantees the right for using DGS and the support of interpreters in administrative and educational contexts. However, DGS is still not widely accepted and acknowledged in a predominantly hearing society that promotes spoken language use. Consequently, all signers live in a bilingual environment and thus, develop German language competency by using written German and by interacting with and in a hearing society. This also affects the form, structure and use of language which becomes obvious when regarding for instance the use of mouthings and the manual alphabet in DGS (Ebbinghaus 2012). Mouthings are (silently) mouthed (parts) of words coming from the surrounding spoken language. They usually do not add additional information but sometimes can be used to differentiate the meaning

between manually identical signs such as JAM, BUTTER and COLOR. In DGS these signs are produced identically and differ only in the corresponding German mouthing *Marmelade*, *Butter* and *Farbe* (Pendzich 2020). The manual alphabet is used for loan signs such as the DGS sign JOB which incorporates the sign for the letter J and involves a movement and wrist of the arm as well a change of hand orientation ending in the sign for the letter B. Furthermore, initialized signs such as DATA in DGS start with a handshape representing a letter from the manual alphabet and which corresponds to the written form of the surrounding spoken language (Ebbinghaus 2012: 235–239). Both, the use of mouthings and the use of the manual alphabet, show variation concerning age and generation. Whereas elderly signers predominantly use mouthings, younger signers use them less. On the contrary, the modern manual alphabet is largely unknown to elder generations of signers (Hillenmeyer & Tilmann 2012: 263–265).

2.2 Academic research settings regarding DGS

The previous section made clear that the sociolinguistic situation of DGS must be considered against the backdrop of a complex acquisition and language transmission situation, the political, historical and educational background of DGS, the lack of standardization, a missing writing system and a constant contact with a spoken language society. All these mentioned aspects contribute to and support the view of DGS as a minority language. However, since the 1980s, there is a growing interest in supporting the acknowledgment and recognition of DGS in Germany which is closely connected to its academic research settings which I will briefly illustrate in this section.

Academic research of DGS in Germany started with a research project on the structure of DGS, established at the University of Hamburg in 1982 by Sigmund Prillwitz. A few years later, Professor Prillwitz founded the Institute (formerly Center) of German Sign Language and Communication of the Deaf in 1986 and Hamburg became the center for sign language research and interpreting in Germany (Boyes-Braem & Rathmann 2010). Since then, several universities at different places in Germany have been offering sign language interpreter trainings for example in Hamburg, Berlin, Magdeburg, Zwickau, Cologne, Idstein and Landshut (Benner & Herrmann 2019). In addition to interpreting study programs, research groups were founded which focus on the investigation of the linguistic structure of DGS, for instance in Hamburg, Berlin, Cologne, Aachen and Goettingen. Research materials of DGS mostly comprise dictionaries such as the Kestner dictionary “Das große Wörterbuch der Deutschen Gebärdensprache” (Kestner & Hollmann 2017), “Spread the sign” (European

Sign Language Center 2018) or various topic-specific lexicons of signs such as the “Fachgebärdenlexika Gesundheit und Pflege” (Konrad et al. 2007). Until today, only a few descriptive grammar books exist which describe the linguistic structure of DGS (Eichmann, Hansen & Heßmann 2012; Happ & Vorköper 2006; Papaspyrou et al. 2008). In the beginning of linguistic research of DGS, description of the grammatical properties of DGS was mainly based on introspection or grammatical judgments of a few deaf signers. Nowadays, there is a growing number of empirical studies ranging from sociolinguistic to neurolinguistic aspects of DGS but the number is still limited compared to research in spoken languages. Recently, the DGS-Korpus project (Hanke et al. 2020), a long-term project of the Academy of Sciences and Humanities in Hamburg, centered at the University of Hamburg, was launched and aims at collecting different types of texts from 330 deaf people of 13 regions of Germany to present, investigate and preserve language variation of DGS. Furthermore, the research and grammatical description of DGS has been promoted by the European project “The Sign Hub: Preserving, Researching and Fostering the Linguistic, Historical and Cultural Heritage of European Deaf Signing Communities with an Integral Resource”. The Sign-Hub project (2016-2020) was funded by the Horizon 2020 framework program of the European Union and aimed at documenting the linguistic, cultural and historical aspects and heritage of Deaf communities in Europe. Research of DGS has been coordinated at the University of Goettingen and within this project, a digital atlas of the linguistic structures of DGS, a digital archive of life narratives by elderly signers in Germany and a digital reference grammar of DGS has been provided. Regarding the latter, it comprises the detailed description of grammatical structures with illustrating examples at the level of phonology, morphology, syntax and pragmatics, and thus, offers a comprehensive overview of the structure of DGS.

2.3 Morphosyntax

While the previous sections gave some background information referring to sociolinguistic, historical and political aspects, the next section will offer an introduction into the morphosyntactic structure of DGS and will describe the main grammatical concepts relevant for this dissertation. In section 2.3.1, I will give a general description of simultaneous constructions found in sign languages and will illustrate them with examples from DGS. In section 2.3.2, I will present the concept of signing space and I will focus on the establishment of person and location reference. In section 2.3.3, I will explain verb types, the verbal agreement system and classifier constructions and in section 2.3.4, I will present the structure of clauses in DGS. Clause structure comprises the basic order observed in declarative clauses

and other sentence types, the order found in embedded clauses and the position of other elements such as modals, negatives and adverbials. Other morphosyntactic aspects such as for instance tense and aspect marking (Happ & Vorköper 2006; Metzger 2009; Papaspyrou et al. 2008), pluralization (Steinbach 2012; Pfau & Steinbach 2005; Pfau & Steinbach 2006b) or the order within the noun phrase (which is though not investigated in detail in DGS, a few remarks are made in Happ & Vorköper (2006)) will not be considered since they are not primarily relevant for this dissertation.

2.3.1 Simultaneity

At first view, sign languages show simultaneity on the phonological level. Signs are composed of four distinct phonological parameters, namely handshape, location, orientation and movement that are produced simultaneously. But above the manual components (hands and arms), sign languages make use of non-manual articulators to convey communicative messages. These non-manual components include the torso, the head and the face and which are realized as head tilts and shakes, eyebrow movements, eye gaze direction and blinks, mouth movements and body tilts and leans among other non-manual markers. All those non-manual elements can be used simultaneously to the hands to produce linguistic elements. The different manual and non-manual articulators can convey the same information in parallel or each of the articulators provides different or additional morphosyntactic, semantic or pragmatic information to the utterance. Vermeerbergen, Leeson & Crasborn (2007) divide simultaneous constructions in three groups: i) manual simultaneity, ii) manual-oral simultaneity and iii) simultaneous use of other (manual or non-manual) articulators. The first group involves the simultaneous use of both hands, while each hand performs a distinct sign on its own. This is frequently found in constructions involving pointing signs which are simultaneous produced to signs articulated on the other hand (Miller 1994) as shown in (2) (Happ & Vorköper 2006: 421). A very common simultaneous strategy in sign languages is known as preservation (Miller 1994) or buoys (Liddell 2003). In these constructions, one hand holds a sign while the other hand continues performing strings of signs as in (3) (Papaspyrou et al. 2008: 199). Example (3) involves a classifier handshape for HOUSE, which is hold in stationary configuration on the non-dominant hand while the dominant hand continues signing (more on classifiers in section 2.3.3).

- (2) YEAR LAST DANIELA PARIS_a MADRID_b ROM_c DRIVE_a DRIVE_b DRIVE_c [DGS]
 h1: L-O-U-V-R-E_d VISIT_d P-R-A-D-O_e VISIT_e MASS HOLY_f VISIT_f
 h2: IX_{loc(a)}----- IX_{loc(b)}----- IX_{loc(c)}-----
 ‘Last year, Daniela went to Paris, Madrid and Rome. She visited the Louvre in Paris, the Prado Museum in Madrid and the holy mass in Rome.’
- (3) h1: POSS₁ HOUSE IX₁ CAR PARK-NEXT-TO-IT GET-OUT [DGS]
 h2: BE-LOCATED_{cl}-----
 ‘I park the car next to my house and get out.’

Manual-oral simultaneity involves mouthings (silently spoken words of the corresponding surrounding language) which are simultaneously produced with signs. Mouthings accompanying signs can be full realizations of the corresponding word or they may be reduced as in (4) (Hohenberger & Happ 2001: 159). Example (4) shows that the verb is accompanied by the reduced mouthing *wasch* and lacks the suffix *-en* as it would be the case in German, whereas all other mouthings are full representations of the corresponding German words. In addition, mouthings can be stretched over several signs (5) (Hohenberger & Happ 2001: 170). In (5), the mouthing spreads over the signs COFFEE-DRINK and EAT signaling the overall situation context. Mouthings usually convey redundant information as in the examples from DGS but it is possible that they add additional information. In Flemish Sign Language (VGT) the verb SIT can be simultaneously produced with the mouthing *op* to express the meaning ‘sit on’ (Vermeerbergen, Leeson & Crasborn 2007: 2).

- (4) neun ubr früh vater auto wasch [DGS]
 NINE O-CLOCK EARLY FATHER CAR WASH
 ‘At nine o’clock a.m. the father is washing the car.’
- (5) frü---h-----st-----ü----ck [DGS]
 EAT COFFEE-DRINK EAT
 ‘(She) is having breakfast.’

Simultaneous use of other (manual or non-manual) articulators refers to non-manual components different from the mouth. Usually they provide additional information such as signaling a conditional relationship between two clauses as shown in (6) (Herrmann & Pendzich 2014: 2157).

- [DGS]
- (6) $\frac{\text{br}}{\text{MOUSE}} \text{ PUT } \frac{\text{hn}}{\text{START}}$
 ‘If the mouse (card) is put (on the table), then (the game) starts.’

The function of simultaneous constructions has been linked to provide temporal or locative information or to signal discourse information such as topic-comment structures. Moreover, they are used to foreground and background information (Miller 1994) or are connected with different perspectives (Perniss 2007a).

2.3.2 Use of space

The signing space is a three-dimensional area in front of the signer’s torso. It is firstly used for the articulation of signs on the phonological level. Apart from articulatory reasons, the signing space serves to express several linguistic functions on the morphological, syntactic, semantic and pragmatic level such as the expression of times limes (Pereiro & Soneira 2004), the realization of verb agreement (Padden 1990), the establishment of discourse referents and the structuring of communicative interaction (Barberà 2013; Engberg-Pedersen 1993; Perniss 2012). I will concentrate on the morphosyntactic uses of signing space such as person and location reference and realization of verb agreement since this will be relevant for the study of word order and agreement in DGS.

Person and location references are established via association of referents with locations in the signing space. The physical location of the signer, in particular the location on or near the signer’s chest, corresponds to reference to the first person. For second- or third-person reference, locations in the signing space are associated with the addressee or a third person. These locations in space are chosen due to the actual position of referents if these are present or the locations in space represent referents arbitrarily if these are absent. Thus, signs are modulated or directed towards the actual or arbitrarily chosen position of the referent. In the former, space is used topographically, while the latter describes the syntactic use of space (Perniss 2012). Syntactic use of space is used either for pronominal reference or to identify the arguments of the verb. In DGS, one referent will be positioned on the ipsilateral side (3a) of the signer, while another referent will be located contralateral (3b) (figure 5) (Pfau, Salzmann & Steinbach 2018: 3). Agreement verbs like HELP (see the next section 2.3.3 on verb types and agreement in DGS) may thus be modulated according to these locations associated with the referents to express that the referent located at 3a helps the referent located at 3b.

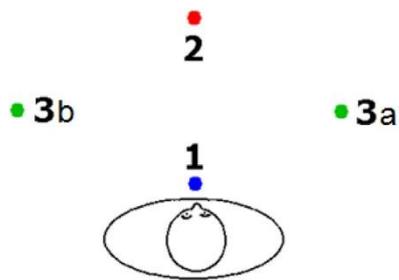


Figure 5: Establishment of two discourse referents in space (Pfau, Salzmann & Steinbach 2018: 3)

2.3.3 Morphological processes: agreement and classifier system

For the study on word order in DGS, verb types and the agreement system in sign languages play a significant role. Here, I will briefly describe the verbal system of DGS, a more detailed description can be found in section 3.2.2. Verbs in sign languages are commonly divided into three main categories based on morphosyntactic criteria: plain verbs, agreement verbs and spatial verbs (Costello 2015; Lillo-Martin & Meier 2011; Mathur & Rathmann 2012; Padden 1988; Padden 1990; Sandler & Lillo-Martin 2006). They differ whether and how they can be modulated in space depending on the properties of the verb's arguments, which is commonly understood as agreement. Verbs in DGS follow this tripartite classification. Plain verbs cannot change their articulation form since they have a fixed place, which is often near or on the body. Agreement verbs change path movement and/or orientation to agree with their syntactic arguments subject and/or object. The path movement starts at a locus in space associated with the subject and ends at the locus associated with the object. The opposite pattern is observed with backward agreement verbs whose movement goes from object to subject locus. Spatial verbs can be modulated as well, however, they do not agree with their syntactic arguments but with locative arguments/adjuncts (Erlenkamp 2012; Hänel 2005b; Happ & Vorköper 2006; Keller 1998; Papaspyrou et al. 2008; Rathmann & Mathur 2002; Rathmann & Mathur 2005; Rathmann & Mathur 2008; Schwager 2012; Steinbach 2007). In addition, some sign languages have developed agreement auxiliaries such as the agreement marker PAM (Rathmann 2003) (figure 6) to overcome the agreement gap which arises with plain verbs. By modulating path movement and hand orientation PAM expresses agreement and coincides with the loci of subject and object. The position of PAM is either pre- or postverbal and it occurs with plain and (un)modified agreement verbs (see sections 3.2.2 and 5.6.6 for a detailed discussion of PAM in DGS) (Bross 2020b; Macht & Steinbach 2019;

Murmann 2012; Pfau & Steinbach 2006a; Rathmann 2003; Steinbach 2011; Steinbach & Pfau 2007).



Figure 6: The agreement marker PAM

Furthermore, DGS as well as other sign languages uses classifier predicates which are meaningful handshapes and which denote particular characteristics of the referred objects (Zwitserlood 2012). Usually, two types of classifier predicates are distinguished: whole-entity and handling classifiers. Whole-entity classifiers represent entities as a whole and denote the size and shape or semantic characteristics of the object, whereas handling classifiers represent parts of the entities and refer to the handling and movement of these. In (7), the path movement of the agreement verb GIVE is modulated from the signer (the subject) towards the addressee (object) to express agreement with both arguments. Additionally, the verb combines with a handling classifier handshape to specify the giving of a long, thin object (Glück & Pfau 1998).

- (7) IX₁ FLOWER₁ GIVE_{2CL(long, thin object)} [DGS]
 'I give you a flower,'

2.3.4 Clause structure

So far, DGS has been described as a SOV language (Bross & Hole 2017; Happ & Vorköper 2006; Herrmann 2013; Herrmann & Steinbach 2013; Keller 1998; Pfau & Glück 2000; Rathmann 2003). In main declarative clauses containing transitive verbs, which select for two arguments, the verb follows subject and object.² In clauses with ditransitive verbs, the indirect

² The identification and definition of grammatical relations and categories such as subject and object is a controversial issue in linguistic research. Moreover, it is often tied to the research tradition and used theoretical framework. Scholars following a generative viewpoint prefer the syntactically determined notions of subject and object, whereas scholars using more functional-typological frameworks usually deal with the semantically defined notions of agent and patient. This controversy in terminology also holds for sign languages. While one group argues that sign languages display the grammatical categories subject and object, others question or even reject such concepts for sign languages (e.g. Bouchard & Dubuisson (1995)

object precedes the direct object leading to an unmarked SO(ind)O(dir)V order (Happ & Vorköper 2006; Rathmann & Mathur 2008). In clauses with intransitive verbs, the subject appears before the verb. The figure-ground principle is frequently applied in DGS and has consequences for the ordering of arguments/adjuncts (Happ & Vorköper 2006). Bigger and less mobile entities occur before smaller and moveable entities in a clause. Consequently, orders deviating from basic SOV order are found such as an OSV order illustrated in (8) (Steinbach 2007: 163). A detailed description of the position of arguments in the clause is given in section 3.1.2 and will be investigated and discussed in sections 5.6 and 6.

- (8) TABLE BOOK LIE_{CL} [DGS]
 ‘The book lies on the table.’

Further deviations from basic word order are observed in clauses which show subject and/or object drop as in (9) (Glück & Pfau 1998) and in clauses involving topicalization as in (10) (Steinbach 2007: 163). Example (9) involves an agreement verb (SHOW) which clearly specifies the subject and object argument by modulating the start- and endpoint of movement. Hence, the subject and object argument can be dropped in the following discourse. In (10), the object BOOK is moved to the clause-initial position, which can host topic-like elements. Topics are usually non-manually marked by raised eyebrows.

- (9) MAN IX_{3a} CHILD IX_{3b} MEET / BOOK _{3a}SHOW_{3b} [DGS]
 ‘The man meets child. (He) shows (him) the book.’

- top [DGS]
 (10) BOOK PETER READ
 ‘As for the book, Peter reads it.’

Furthermore, other elements in the clause have quite flexible positions in DGS. Time adverbials occur frequently clause-initially as in (11) (Happ & Vorköper 2006: 119). Local adverbials can appear clause-initially or are usually placed preverbally (Happ & Vorköper 2006).

and see section 3.1.2.1 for further remarks on it and Leeson & Saeed (2012) for an overview). Though being aware of the critical comments, I will use the terms subject and object throughout the dissertation since the analysis mainly follows a generative tradition.

- (11) NEXT WEEK MARIA BOOK READ [DGS]
 ‘Maria will read a book next week.’

Modal verbs can appear pre-and postverbally (see (12); (Papaspyrou et al. 2008: 174)). Negative elements such as the negative particle NOT, however, are placed clause-finally following the verb and need to be accompanied by a negative headshake which spreads over the verb and the negative element as in (13) (Pfau 2008: 46).

- (12) [DGS]
 a. IX₁ CAN DIVE
 b. IX₁ DIVE CAN
 ‘I can dive.’

- (13) WOMAN FLOWER BUY NOT [DGS]
 _____^{hs}
 ‘The/a woman doesn’t buy a flower.’

Apart from main clauses, other sentence types such as imperatives or interrogatives also show SOV order. Imperatives are not well researched in DGS. However, it seems that they do not involve word order deviations but rather involve faster and more expressive signing (Happ & Vorköper 2006; Papaspyrou et al. 2008). Interrogatives, especially wh-questions and the position of wh-words, on the other hand, received a lot of attention and are well described in the DGS literature (Bross 2020a; Grin 2014; Happ & Vorköper 2006; Herrmann, Proske & Volk 2019; Herrmann & Steinbach 2013; Jahnke & Volk 2015). In yes/no-questions the word order is the same as in declaratives, they only differ in the use of non-manuals. Whereas declaratives involve neutral non-manuals, yes/no-questions are marked by raised eyebrows that scope over the entire clause (14a) (Papasprou et al. 2008: 172). In contrast, wh-questions involve furrowed eyebrows and a slightly forwarded head tilt as non-manual markers. The basic order is verb-final, but the position of wh-words can vary. Wh-words appear in clause-final (14b) or clause-initial position (14c) or they appear doubled in clause-final as well as in clause-initial position (14d). However, the latter is usually used for emphasis (examples taken from Happ & Vorköper (2006: 324)).

2.4 Summary

Chapter 2 gave a brief overview of the sociolinguistic situation of the Deaf community and the current academic research situation regarding DGS in Germany. It further provided the reader with the relevant background information of the linguistic structure and illustrated the main morphosyntactic properties of DGS.

The Deaf community in Germany is quite heterogeneous which is caused by a complex acquisition and language transmission situation, the former and current historical and political background of DGS and is further promoted by a missing standardization and written form of DGS. Many signers acquire DGS not as L1 from their deaf parents but receive their first DGS input from deaf peers who they met in Deaf associations or clubs or in a deaf or bilingual kindergarten or school. Since DGS faces a long tradition of oralism, deaf education is still confronted with a strong focus on oral articulation but a shift towards more sign language use or combined methods of signs and speech has taken place. Furthermore, the extensive regional spread of the Deaf community and the existence of deaf schools has been linked to the high degree of dialectal variation observed in the lexicon and on other grammatical levels of DGS. Furthermore, the specific bilingual contact situation of spoken German and signed DGS has consequences for the linguistic structure of DGS reflected for instance in the use of mouthings and other contact phenomena. Although DGS has been legally recognized as an own language in 2002, there does not exist a standard variety or standard form of DGS and attempts to uniform its use and structure have been seen critically. The legal and political recognition and acknowledgment of DGS is further connected to its academic research which started in 1980 with the foundation of the Institute (formerly Center) of German Sign Language and Communication of the Deaf at the University of Hamburg. Since then further universities have established places, which focus on sign language interpreting and the linguistic research of DGS. Description of the grammatical structure of DGS mostly comprises dictionaries and descriptive research materials, however, there is a growing number of empirical studies of DGS and two recent research projects, the DGS-Korpus and the Sign-Hub project, aim to provide an extensive description and preservation of the linguistic structure and cultural properties of DGS.

The second part of chapter 2 introduced the main grammatical concepts of DGS relevant for this dissertation. Sign languages can use manual and non-manual components simultaneously which can convey the same information in parallel or provide additional morphosyntactic, semantic or pragmatic information with each of the articulators. Simultaneous constructions comprise the simultaneous use of both hands often found in

constructions involving pointing signs or they refer to the phenomenon known as buoys (Liddell 2003). Moreover, simultaneous constructions include the simultaneous use of non-manual elements such as mouthings and other non-manual markers. Signs are produced in space around the signer, which can be used, among other functions, for establishing reference with persons and locations. Referents are associated with actual or abstract locations in the signing space and these locations can be used for pronominal reference or the realization of verb agreement. Agreement verbs express agreement with subject and/or object by modifying path movement and/or hand orientation. Spatial verbs coincide with locative arguments/adjuncts. Plain verbs do not express agreement since they cannot be modulated due to their fixed place of articulation. Moreover, DGS developed an agreement marker PAM that can establish agreement with plain verbs. Furthermore, DGS verbs involve classifier handshapes, which represent characteristics of the referred object. Whole-entity classifiers denote the size and shape of an object as a whole, whereas handling classifier handshapes represent the handling and movement and refer to parts of the object. The structure of clauses has been identified as SOV. Verbs follow objects in transitive clauses and subjects in intransitive clauses. In ditransitive clauses, the order is SO(ind)O(dir)V. Deviations from basic order are caused due to the figure-ground principle or are observed in constructions involving topicalization or the drop of subject and object arguments. Other elements show more flexibility regarding positions. Time adverbials are usually placed clause-initially, modal verbs can be used pre- or postverbally and negative elements appear in clause-final position. DGS does not show deviation from SOV order in other sentence types and embedded clauses. Imperatives and interrogatives follow the same order as declaratives but involve specific non-manual articulators. Furthermore, the positions of wh-words in wh-questions either is clause-initially, clause-finally or doubled in both positions. Embedded clauses are mainly juxtaposed and DGS uses only a few subordinating conjunctions.

3 Word order and agreement in spoken and sign languages: descriptive and empirical observations

Chapter 3 presents the descriptive and empirical background on word order and agreement in spoken and sign languages. The first part of this chapter focuses on word order in spoken and sign languages respectively. It discusses the issue of a definition of basic word order, as well as the factors influencing it and describes typological observations relevant for the research on word order. The second part of this chapter concentrates on agreement in spoken and sign languages and describes the process and properties of agreement in both modalities.

3.1 Word order

3.1.1 Word order in spoken languages

This section deals with word order and word order variation observed in spoken languages, which I will mainly describe from a typological point of view. At some parts, emphasis is put on word order variations found in German. German shows two varying orders in main and dependent clauses but involves a strict rule of verb placement as the second constituent in main clauses. Other constituents, especially in the middlefield ('Mittelfeld'), can be freely ordered and are identified by other means such as case marking. Hence, German word order nicely illustrates the problematic issues in defining the notion of 'basic word order'. This section is organized as follows: Section 3.1.1.1 starts with an overview of the word orders found in the world's languages and discusses criteria and problems of defining the term basic word order. In section 3.1.1.2, I will list factors that have an impact on word order and will illustrate word order influences based on variations found in the German middlefield. In section 3.1.1.3, I will finally review cross-linguistically observed word order correlations.

3.1.1.1 Defining word order

In linguistic typology, one central question is how languages differ from each other regarding their *word order*. On the one hand, word order refers to the order of elements within a given set such as the order of noun, determiner or adjective within a noun phrase. On the other hand, word order refers to the order of subject (S) and object (O) relative to the verb (V) at the clausal level. Hence, it is sometimes referred to as *basic word order* or even as *constituent order*. Moreover, research on word order usually considers the order as basic "that occurs in stylistically neutral, independent, indicative clauses with full noun phrase (NP) participants

where the subject is definite, agentive and human, the object is a definite semantic patient and the verb represents an action, not a state or an event” (Siewierska 1988:8) as illustrated in (16).

(16) The child eats the soup.

In other terms, basic word order deals with the order of subject, object and verb in an unmarked transitive declarative clause.

However, some problematic issues arise with this kind of definition. As pointed out by Siewierska (1988:8-14) the above mentioned type of clause is very infrequent in natural languages. She demonstrates that there are a number of (spoken) languages which do not express subject and object as full NPs, use noun incorporation or allow for subject pronoun dropping. Moreover, it is more common in natural discourse to use pronominal forms once a referent or information is established as given. In (17) (cited from Siewierska (1988: 9)) an example from Puget Salish is shown, a language spoken by the Salish tribes in Washington. It nicely illustrates that arguments can be expressed as either full NPs or pronominal forms. In Puget Salish only one of the arguments of a transitive verb is expressed as a full NP. It is either the subject or the object, the other argument usually occurs as a pronominal suffix (-s in (17)a), *-sid* in (17)b)). A further challenge in defining and determining word order is found in languages with subject pronoun dropping as in Italian exemplified in (18) (Siewierska 1988: 12). In (18)b), the subject pronoun *io* can be omitted since the subject is identified due to the verb ending *-o* resulting in a VO order, whereas the drop of the subject pronoun in (18)c) results in an OV order. Accordingly, this leads to the question which criteria should be considered for identifying and determining word order. I will come back to this issue in more detail in the course of this chapter.

(17) [Puget Salish]

- a. ʔu-k^wax^wat-s čax^w
 COMPL-helped-me you
 ‘You helped me.’
- b. ʔu-k^wax^wat-sid tə stubs
 FUT-help-you the man
 ‘The man will help you.’

- (18) [Italian]
- a. Io vedo Gianni
‘I see Gianni.’
- b. Vedo Gianni
see Gianni
‘I see Gianni.’
- c. Lo vedo
him see
‘I see him.’

In addition to the definition of basic word order, the determination of word order types can be a challenging issue. One of the main goals in typological research is to group and classify languages as belonging to one specific word order type. There are six logically possible orders of S, O and V in a language: SOV, SVO, VSO, VOS, OVS and OSV. Every order is attested in *The World Atlas of Language Structure* (henceforth *WALS*, <https://wals.info>), a database which collected structural properties of a large sample of languages (Dryer & Haspelmath 2013). The following table 1 and figure 7 are taken from *WALS* Chapter 81 (Dryer 2013a) and illustrate the number and geographical distribution of the word order types observed in languages across the world.

Table 1: Word order patterns

Value	Representation
Subject-object-verb (SOV)	565
Subject-verb-object (SVO)	488
Verb-subject-object (VSO)	95
Verb-object-subject (VOS)	25
Object-verb-subject (OVS)	11
Object-subject-verb (OSV)	4
Lacking a dominant word order	189
Total	1377

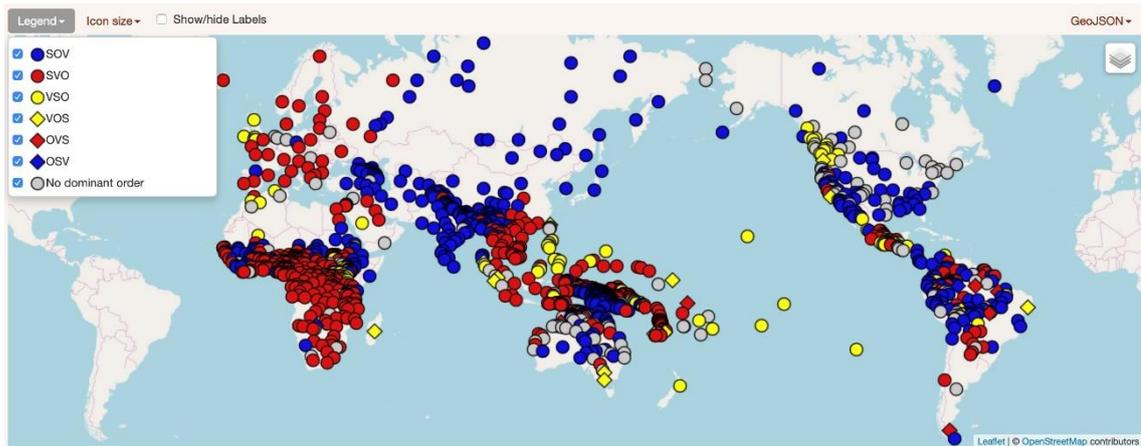


Figure 7: Distribution of different types of word order (Dryer 2013a)

Regarding the table and figure above, it is obvious that SOV and SVO are the most widespread word orders found in the world's languages. SOV languages like Persian and SVO languages such as Italian occur most often, to be precise more than five times as often compared to the other orders. Although every order is attested, languages with object initial orders such as OVS found in South America and OSV spoken in Venezuela, for instance, are rather rare. Languages with *rigid word order* as English can be easily classified as belonging to one of the above-mentioned word order types. In languages with *free word order* or as in Dryer's terms in languages with a more *flexible word order* every type of pattern is observed and no order is more dominant compared to another order. As a result, word order classification in a free word order languages is a challenging issue (Dryer 2013a).

In flexible word order languages such as Russian, one order is usually considered as the basic word order. Dryer (2013a) calls this the *dominant order* as this order is usually more common or less restricted compared to the other attested orders. While the dominant word order of Russian is SVO, there are other languages with flexible word orders in which none of the described orders can be considered as the dominant order. Hence, these languages are referred to as *lacking a basic word order* by Dryer (2013a). Such a language is for example German. German shows two varying dominant orders when comparing main and subordinate clauses. German main clauses without an auxiliary as in (19)a) show a dominant SVO order. In subordinate clauses as (19)b) and in clauses with an auxiliary as in (19)c) the dominant word order is either SOV or S(Aux)OV. However, subordinate clauses can also have a SVO order under certain conditions as in (19)d)(example cited from Wegener (1999: 19)). Since none of these observed orders can be considered as dominant relative to the other, German is classified as lacking a basic word order according to Dryer (2013a).

- (19) [German]
- a. Das Kind liest ein Buch [SVO]
 the child reads a book
 ‘The child is reading a book.’
- b. ...dass das Kind ein Buch liest [SOV]
 that the child a book reads
 ‘...that the child is reading a book.’
- c. Das Kind hat ein Buch gelesen [SAuxOV]
 the child has a book read
 ‘The child read a book.’
- d. [Gib mir mal das Buch,] weil du stehst grad am Regal.
 Give me just the book because you stand just at shelf
 ‘Give me the book, you’re standing at the shelf.’
 [SVO]

Furthermore, German is usually classified as a verb-second (V2) language in the main clause. As illustrated in (19)a) and (19)c) above in German main clauses, the finite verb is always the second constituent of the clause regardless of the type of the first constituent. Hence, it is possible in German to have sentences like (20)a) and (20)b).

- (20) [German]
- a. Ein Buch liest das Kind [OVS]
 a book reads the child
 ‘The child is reading a book.’
- b. Gestern las das Kind ein Buch [VSO]
 yesterday read the child a book
 ‘The child read a book yesterday.’

In (20)a) the object precedes the finite verb. Therefore, the order is OVS, whereas in (20)b) an adverb precedes the finite verb resulting in a VSO structure. However, research in line with generative syntax assumes that the *underlying word order* of German is SOV. In the concept of Chomsky’s generative grammar underlying word order refers to the order of phrase

structures build up in the deep structure³ (Chomsky 1965). Deep structure order needs to be distinguished from the order observed at the surface structure, which is considered as the result of a transformational process. Referring to the German examples above, generative approaches assume that the base position of the verb is clause-final and all other orders are derived via movement operations from that structure. The V2-phenomena in German and other Germanic languages received much attention over the years; the same holds for the relative freedom that German exhibits regarding the order of elements in the middlefield ‘Mittelfeld’ also known as scrambling shown in (21) (an overview on V2 is found in Holmberg (2015) and an outline on scrambling in German is given in Abels (2015) and Frey (2015)).

- (21) [German]
- a. ...weil dem Kind das interessant-e Buch gefällt
 because the.DAT child the.ACC interesting-ACC book like
 ‘...because the child likes the interesting book.’
- b. ...weil das interessant-e Buch dem Kind gefällt
 because the.ACC interesting-ACC book the.DAT child like
 ‘...because the child likes the interesting book.’

Another line of research, using a more information-based approach, describes word order variations according to information-structural notions like topic and focus and discourse related aspects such as givenness and new information. Hence, sentence (20)a) above can be explained by giving an answer to a question like *what is the child reading?*, where *child* and *reading* are given information and *book* is the focused constituent providing new information as in (22).

- (22) Was liest das Kind? (‘What is the child reading?’) [German]
- [Ein Buch]_{FOCUS} liest [das Kind]_{TOPIC}
 a book reads the child
 ‘The child is reading a book.’

³ The notions of deep and surface structure were first introduced by Chomsky in the early 60’s and later developed in Chomsky (1981), but are no longer relevant in his Minimalist Program (Chomsky 1995). See also section 4.1.2 for the theoretical background of word order within Generative Grammar.

The interaction between syntax and information structure regarding topicalization, i.e. the movement of constituents in the prefield ‘Vorfeld’, as well as concerning scrambling phenomena in German as illustrated in (21) are well-described phenomena in German syntax (see for instance Fanselow 2001; Frey 2004; Haider & Rosengren 2003; Höhle 1982; Lenerz 1977; Müller 1999). Moreover, it has been controversially discussed in the literature on German word order how unmarked word order should be defined and which factors trigger the choice of order (see also the next section 3.1.1.2 for a further discussion of factors affecting word order in German). The literature is too extensive to cite exhaustively; thus, a few representatives comprise for instance Abraham (1986), Frey & Pittner (1998), Haider (1993), Höhle (1982), Lenerz (1977), Müller (1999), Reis (1987), Uszkoreit (1987). However, it shows that word order definition and classification is not a trivial issue even for well-studied spoken languages as German and especially for sign languages (see section 3.1.2 for a discussion of word order in sign languages).

Moreover, word order classification is tied and biased by the criteria used for determining basic word order and which thus have to be reflected critically. Typological studies are usually based on the criterion of frequency although this criterion must be taken with caution. Further criteria used in typological word order research as listed in Dryer (2007) are the following⁴:

- Frequency of usage
- Distribution
- Simplicity
- Pragmatic neutrality

The criterion of frequency states that the basic word order is the order that is used the most in any language. Frequency is the most common used diagnostic for identifying word order in typological research because it is a clearly operational and reliable test. The maps and descriptions in the WALS are mostly based on the criterion of frequency. However, this criterion has been criticized as mentioned before, since an unmarked transitive declarative clause with overt subject and object noun phrases is rather rare in natural discourse. Furthermore, as summarized in Dryer (2007: 74), the following arguments have been put forward against frequency: It is i) not part of the grammar and ii) it can be influenced by the

⁴ Besides that, theory-internal criteria can be used as a diagnostic for basic word order such as grammatical functions, case marking, focus and stress marking or scope effects (see Frey (2015) for a further description of these).

size and sort of corpora used for counting order. Another criterion related to frequency is distribution. The basic word order is the order that is less restricted compared to other orders. Although languages can show variable orders, one order might be restricted to specific syntactic contexts and therefore, less basic compared to the other order. Typically, an order that only appears in a specific context is usually less frequent than other orders. Furthermore, the criterion of simplicity or markedness has to be taken into account. The word order identified as basic should be as simple as possible without complex phonological, morphological or syntactical marking. Mithun (1992: 47) criticizes that criteria of distribution and simplicity are only applicable for languages which have a syntactically defined rigid word order. She presents data from Cayuga, an Iroquoian language spoken in Ontario, Ngandi, an Australian aboriginal language and Coos, spoken by the indigenous people in Ontario. These languages do not show additional morphological marking, hence making it impossible to determine which order is less restricted or marked compared to other orders. Finally, basic word order appears in neutral contexts with no additional pragmatic effect. It has been argued that the beginning of a discourse or the beginning of narratives is pragmatically neutral since no linguistic information had been established beforehand. Mithun (1992: 47–51) remarks that the beginning of narratives is in fact highly marked because topics have to be established as a first step. She also found in her data on Cayuga that conversations do not start with basic declarative sentences but rather start with questions or even commands.

Since transitive clauses containing subject and object noun phrases are infrequently found in languages, Dryer (1997) argues for a word order classification based on the distinction OV vs. VO and SV vs. VS. Furthermore, he argues that word order research often ignores intransitive sentences, even though it is known that in languages like Spanish or Polish VS is quite common with intransitive verbs and SV with transitive verbs.

3.1.1.2 Factors influencing word order

The previous section discussed the definition of basic word order, the classification of languages to word order types as well as the criteria used for identifying basic word order and showed that those aspects interact with each other. The question of basic word order is further challenged by several factors which might impact word order in general and which are discussed in Siewierska (1993). She divides these influencing factors into hierarchies and classifies them into formal, dominance and familiarity hierarchies. Formal hierarchies comprise factors concerning length and syntactic complexity, dominance hierarchies include lexical and semantic factors and familiarity hierarchies cover discourse and information-

structural notions. The full list of factors⁵ as listed in Siewierska (1993) is given in (23) (> indicates that the element precedes the other).

(23)

- a. Formal Hierarchies
 - i. structurally simpler > structurally complex
 - ii. short > long
- b. Dominance Hierarchies
 - i. The Personal Hierarchy

1stp. > 2ndp. > 3rdp. human > higher animals > other organisms > inorganic matter > abstracts
 - ii. The Semantic Role Hierarchy

agent > patient > recipient > benefactive > instrumental > spatial > temporal
- c. Familiarity Hierarchies
 - i. more familiar > less familiar topic > comment
 - ii. given > new
 - iii. definite > indefinite
 - iv. referential > nonreferential

Research on word order in German, especially on word order in the German midfield, has shown that the factors and principles mentioned by Siewierska (1993) might impact German clause structure. Frey (2015: 522) lists the most often stated principles which have been considered as interacting and structuring constituent order in German and which can be summarized as follows:

- subjects or agents precede objects or other thematic roles
- definite, pronominal and animate arguments occur before indefinite, non-pronominal and inanimate arguments
- topics, given information and focal elements appear before non-topics, new information and non-focal elements
- non-heavy and scope bearer elements precede heavy and scope taker elements.

⁵ The theory presented in Hawkins (1994) doubts whether all these factors are indeed needed. He claims that discourse and lexical-semantic factors can be reduced to one single factor called weight since the human parser generally prefers structures that are less complex and smaller.

However, there is a disagreement about the relevance of these factors and about the extent of their influence (Dietrich 1994; Lenerz 1977; Müller 1999; Primus 1994; Reis 1987; Uszkoreit 1987 and others). A corpus study by Bader & Häussler (2010) on the variation of subject-object (SO) and object-subject (OS) sentences in the German middlefield and prefield found that the choice of order between SO and OS sentences can be best explained by lexical-semantic and discourse factors. In particular, they showed that order is determined by i) case marking, ii) verb semantics and animacy properties of the verb's arguments, iii) definiteness and iv) weight. Regarding i), Bader & Häussler found that SO sentences in the middlefield occur with objects bearing accusative case, while OS sentences appear with objects bearing dative case. For sentences that have a subject or object located in the prefield, SO and OS order both show a preference for accusative case. Referring to ii), they showed that animacy predicts word order in the middlefield but not in the prefield. OS order in the middlefield is chosen when the subject is inanimate and the object animate. In addition, OS order in the middlefield with dative objects usually contains passivized ditransitive or unaccusative verbs. In contrast, SO order in the middlefield occurs with animate subjects. Interestingly, OS order in the prefield is not influenced by the animacy of the arguments. Instead, objects are moved into clause-initial position when they are topics of the sentence. Hence, discourse-related factors determine OS order in prefield sentences. Concerning the definiteness of the NP arguments (iii), SO is the preferred order in sentences with an accusative object irrespective whether the subject is definite or indefinite. However, sentences with a dative object show OS order when the dative object is definite and the subject indefinite. Considering iv), Bader & Häussler showed that NP-related clauses (clauses which are modifiers or complements of the subject or object NP) tend to appear outside of the middlefield, whereas constituent length (measured in number of words) did not have an effect on the choice of order.

In addition to the factors mentioned and tested in Bader & Häussler (2010), context may affect word order choices. For instance, in an acceptability judgment task and a self-paced reading study, Weskott et al. (2011) tested whether processing of OVS sentences compared to canonical SVO sentences in German is context dependent. They found that context had no influence on canonical SVO sentences, but OVS structures were better judged and processed faster if presented in a context displaying a part-whole relation as in (24). There, the object *side mirror* is a part of the entity *the car* of the context sentence.

(24) Context: [German]

- a. Peter hat den Wagen gewaschen.
 Peter has the.ACC car washed
 ‘Peter has washed the car’

SVO

- b. Er hat den Außenspiegel ausgelassen.
 he.NOM has the.ACC side.mirror left.out
 ‘He left out the side mirror.’

OVS

- c. Den Außenspiegel hat er ausgelassen.
 the.ACC side.mirror has he.NOM left.out
 ‘The side mirror, he left out.’

In addition to the above-mentioned grammatical factors, there are several other factors, which might have an effect on clause structure. Such factors comprise the form of language (written or spoken), text type or register (Siewierska 1993: 829–830).

3.1.1.3 Typological observations

Though the previous sections clearly showed that the definition of basic word order is not trivial and word order is influenced by several factors, the question of a basic word order is fundamental in linguistic research since the order of subject, object and verb is seen as a prerequisite for many other grammatical phenomena. Furthermore, in syntactic typological research, it is still a major goal to find correlations between the order of the main constituents and other elements in a sentence, which will be discussed in the following.

The study of word order typology started with the work of Greenberg (1963) who proposed 45 linguistic universals based on a sample of 30 languages. On the one hand, he classified languages based on the order of S, O and V. On the other hand, he demonstrated that the order of S, O and V correlates with other elements of the sentence such as for example the order of noun and genitive. Further studies by Hawkins (1983), Tomlin (1986) and Dryer (1992) based on a larger sample of languages showed a number of features that correlate with the order of object and verb. The following section will describe the main observed tendencies.

While comparing OV and VO languages, it was observed that OV languages tend to be postpositional as exemplified in (25) by Nivkh, an isolated language spoken in Russia (Dryer 2013b). In (25), the postposition *rulku* ‘across’ follows the noun *eri* ‘river’.

- (25) n’yŋ pila eri rulku vi-d’ [Nivkh]
 1PL big river across go-FIN
 ‘We went across a big river.’

Furthermore, in OV languages genitives occur before nouns as in (26) and adverbs precede verbs as in (27). Both examples are from Lezgian which is a Northeast Caucasian Language (Dryer 2007: 61–64).

- (26) Farid-an wax [Lezgian]
 Farid-GEN sister
 G N
 ‘Farid’s sister’

- (27) Mirzebeg-a k’ewi-z haraj-na: ‘...’ [Lezgian]
 Mirzebeg-ERG strong-ADV shout-AORIST
 Adv V
 ‘Mirzebeg shouted loudly ‘...’

Additionally, OV languages show the following order in comparative constructions: the element that serves as a standard of comparison (St) is followed by the marker of comparison (M) and the adjective (Adj) as shown in (28) (Dryer 2007: 62).

- (28) sad müküda-laj žiziwa ask’an-zawa [Lezgian]
 one other-SUPEREL a.little low-IMPERF
 St M Adj
 ‘one is a little shorter than the other one’

Moreover, complementizers in OV languages are usually placed at the end of the subordinate clause. Example (29) taken from Dryer (2007: 64) illustrates this case from Siroi, a Madang language spoken in Papua New Guinea.

- (29) [ne kuayar-at] tukunu [Siroi]
 you steal-2SG.PAST because
 Clause Subord
 ‘because you stole it’

On the other hand, in VO languages the reversed pattern is found for all the correlations described above. VO languages like English usually have prepositions, adverbs follow the verb and nouns precede genitives. The order in comparative constructions is adjective, marker and standard of comparison, while complementizers are placed at the beginning of the subordinate clause as exemplified below (30)-(34). These examples are taken from Dryer (2007: 68–71).

- (30) on the table
 Pr NP
- (31) the cover of the box
 N G
- (32) John walked into the room slowly
 V Adv
- (33) Nancy is more intelligent than Jeff
 Adj M St
- (34) because it was raining
 Subord Clause

This general pattern is somehow simplified as even in languages with a rigid SVO order like English, one can find counter examples as in (35) and (36), which clearly show the reversed orders compared to examples (31) and (32) above. In (35) the genitive precedes the noun and in (36) the adverb precedes the verb and as such show a pattern that is usually expected in OV languages.

(35) The box's cover

G N

(36) John slowly walked into the room.

Adv V

The above described correlations are bidirectional in a way that it can be described as “a language is OV if and only if it is postpositional” (Dryer 2007: 89). Dryer (2007) discusses further phenomena that show bidirectional correlations such as the order of verb and adpositional phrases, the position of question particles or the order of article and noun among others. However, there are other correlations, which do not show this kind of bidirectionality as for instance the order of head noun and relative clause. The following table 2 taken from Dryer (2007: 130) summarizes all observed correlations between the order of elements.

Table 2: Correlation pairs

OV	VO
postpositions	prepositions
genitive – noun	noun – genitive
manner adverb – verb	verb – manner adverb
standard – marker	marker – standard
standard – adjective	adjective – standard
final adverbial subordinator	initial adverbial subordinator
adpositional phrase – verb	verb – adpositional phrase
main verb – auxiliary verb	auxiliary verb – main verb
predicate – copula	copula – predicate
final question particle	initial question particle
final complementizer	initial complementizer
noun – article	article – noun
subordinate clause – main clause	main clause – subordinate clause
relative clause – noun	noun – relative clause
noun – plural word	plural word – noun

Interestingly, Dryer (1988b; 1992) shows that there is no correlation between the order of object and verb and the order of noun and adjective although this correlations was previously supposed. It was often assumed that adjectives precede nouns in OV languages, whereas in VO languages adjectives follow their nouns. Overall, more languages show the order of adjective followed by a noun as illustrated by the map (figure 8) and figure 9 below taken from WALS. Nevertheless, this fact is not tied to the order of object and verb (Dryer 2013c).

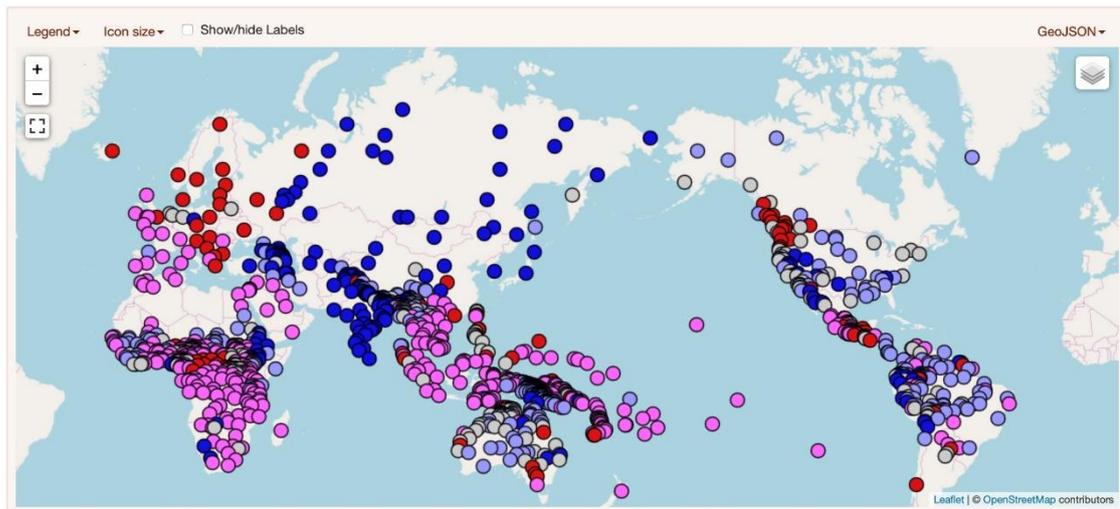


Figure 8: Map of the correlation between object/verb and adjective/noun (Dryer 2013c)

Values		
●	OV and AdjN	216
●	OV and NAdj	332
●	VO and AdjN	114
●	VO and NAdj	456
●	Other	198

Figure 9: Frequencies of the correlation between object/verb and adjective/noun (Dryer 2013c)

There is extensive literature on why elements in a language correlate as described above with varying explanations based on different theoretical assumptions. These are not the focus of this dissertation but see section 4.1.1 for a brief discussion of a few widely acknowledged explanations. An exhaustive overview and discussion of different theoretical accounts can be found in Song (2012) or Primus (2001).

3.1.2 Word order in sign languages

In the previous sections, I discussed word order definition, influencing factors on word order and typological observed word order correlations based on spoken languages. In this section, I will now turn to sign languages and will elaborate whether the same issues are relevant for the study of word order in the visual modality. Interestingly, researchers were concerned with the study of word order since the beginning of research on sign languages by Stokoe (1960).

and specific non-manuals; thus, she explains them as cases of topicalization (38) (Fischer 1975: 5).

- (38) [ASL]
- a. MAN NOTICE CHILD (SVO)
‘The man noticed the child.’
- b. CHILD, MAN NOTICE (OSV)
‘As for the child, the man noticed it.’

Friedman, on the other hand, states that word order is free by using naturalistic data. In contrast to Fischer, she observed that SOV is more frequently used in ASL as compared to SVO. However, she argues against a basic word order due to the high flexibility. Later, Liddell (1980) confirmed Fischer’s observations and demonstrated that SVO is the basic order of ASL and that other orders can be explained by topicalization mechanisms marked by non-manuals such as head tilts, brow raise and prosodic pauses from the rest of the sentence. However, it has been early noted that ASL shows some flexibility in word order compared to the rather rigid word order of English. Especially clauses involving non-reversible situations (39) (Fischer 1975: 14) and agreement verbs (40) ((Padden 1988: 229); glosses slightly adapted) show varying orders in ASL (see also the next section 3.1.2.2).

- (39) [ASL]
- a. BOY LIKE ICE-CREAM (SVO)
- b. BOY ICE-CREAM LIKE (SOV)
‘The boy likes ice cream.’

- (40) BOY IX_{3a} GIRL IX_{3b} _{3a}KICK_{3b} (SOV) [ASL]
‘The boy kicked the girl.’

Based on the observed flexibility, Friedman and others claim that sign languages in general do not have a basic word order (Bouchard 1996; Bouchard & Dubuisson 1995; Friedman 1975; Friedman 1976). Bouchard & Dubuisson (1995: 100) say that

...the use of word order as a means of accounting for the combination of elements by reflecting structural relations is not universal. There are other means that a language can use to indicate what elements combine to form larger constituents and in that case, the language has no specific order that reflects these combinations. We therefore consider that not all languages

have a basic order – only languages in which word order has an important functional role will exhibit a basic order.

Furthermore, research on word order in sign languages often targets the question whether word order is governed by syntactic/semantic principles or by pragmatic rules. The assumption that pragmatics is crucial for word order is put forward in Deuchar (1983) for British Sign Language (BSL), Engberg-Pedersen (1994) for Danish Sign Language (DSL), Rosenstein (2001) for Israeli Sign Language (ISL), Coerts (1994) for Sign Language of the Netherlands (NGT) and Nadeau & Desouvrey (1994) for Quebec Sign Language (LSQ). Rosenstein (2001) argues that sentences in ISL are not the result of a derivation but rather show a topic-comment structure which is the basic principle for sentence structure. Her data showed that topics were not consistently marked by non-manuals and hence, they were not analyzed as instances of movement. Nowadays, most researchers assume that sign languages have a basic word order and argue for a hierarchically organized sentence structure (de Quadros 1999; Neidle et al. 2000; Wilbur 1997; Liddell 1980; Fischer 1975). Among the sign languages researched today, SVO and SOV are the most widespread word orders found in sign languages. Besides of ASL, SVO is reported to be the basic word order of Slovenian Sign Language (SZJ) (Pavlič 2016a) and Brazilian Sign Language (Libras) (de Quadros 1999). Italian Sign Language (LIS) and NGT are identified as SOV languages (Brunelli 2011 among others). In general, researchers acknowledge the fact that sign languages show flexibility with regard to word order and recognize several factors that might have an influence. Those factors will be addressed in the following section.

3.1.2.2 Factors influencing word order

In this section, I will introduce morphosyntactic, semantic and pragmatic factors that have been described as relevant for word order variations in sign languages. While some of them show similar effects as described in spoken languages such as animacy of the arguments or discourse related notions such as givenness or new information (see section 3.1.1.2), other factors such as verb type are modality dependent and have not been identified as influencing factors in spoken languages.

Referring to verb types, research of many sign languages has shown that verbs have an impact on word order. Since Padden (1988) verbs have been commonly divided into plain, agreement and spatial verbs based on their morphosyntactic behavior (more on verb types and agreement in sign languages in section 3.2.2). Plain verbs are specified for a particular place of articulation (frequently on the body but also in the signing space or anchored to the non-dominant hand) and path movement. They cannot be spatially modified to show

agreement with their syntactic arguments. The path movement or finger- or hand orientation of agreement verbs, however, can be modified in order to show agreement with locations in the signing space associated with the subject and/or (indirect) object. Spatial verbs also modify path movement to show agreement, but they agree with locations in the signing space associated with locative adjuncts/arguments. It has been frequently observed that plain verbs show different word order patterns compared to agreement verbs. Whereas plain verbs are frequently used in sentences with SVO structure, agreement verbs (41)a) and spatial verbs (41)b) (both examples taken from Milković, Bradarić-Jončić & Wilbur (2006: 182)) are frequently found in SOV sentences.

- (41) [HZJ]
- a. ČOVJEK KOSA ŽENA ŠIŠATI
 man hair woman cut-hair
 ‘The man is cutting a woman’s hair.’
- b. ČOVJEK DRVO PENJATI-SE
 man tree climb
 ‘The man is climbing up a tree.’

This pattern was observed for ASL (Kegl 2004), Croatian Sign Language (HZJ) (Milković, Bradarić-Jončić & Wilbur 2006), Libras (de Quadros 1999), Jordanian Sign Language (LIU) (Hendriks 2008), Russian Sign Language (RSL) (Kimmelman 2012), Polish Sign Language (PJM) (Rutkowski & Łozińska 2016) and Greek Sign Language (GSL) (Koraka 2021).

Furthermore, classifier constructions may influence the order of a sentence. Classifier handshapes represent physical and geometrical characteristics of classes of objects or people they refer to and are combined with verbs that express the location, movement or handling of the referents. In sentences involving classifier constructions, verbs are usually placed sentence-finally as observed by Pavlič (2016a) for SZJ, Bjerva & Börstell (2016) for Swedish Sign Language (SSL), Hendriks (2008) for LIU and Sze (2003) for Hong Kong Sign Language (HKSL). Pavlič (2016a) demonstrates that word order changes according to the use of classifier handshapes. In (42)a), DRINK is used in its citation form and signed with an SVO structure, whereas in (42)b) DRINK is signed by using a classifier handshape that reflects the form of the used object (for instance a glass). The word order in (42)b) changes into a SOV structure.

- (42) [SZJ]
- a. CHILD DRINK MILK
‘The child drinks milk.’
- b. MOTHER MILK DRINK_{CL}
‘The mother drinks milk.’

Moreover, verbs will often be placed in sentence-final position if they are marked for aspect. Habitual and progressive/continuous aspect is expressed by repetition of the verb movement which may have an influence on word order as recognized by Chen Pichler (2002) and Matsuoka (1997) for ASL and Kimmelman (2012) for RSL.

A frequently observed pattern in sign languages is verb doubling which implies two verb occurrences in the sentence. In the sign language literature, verb echoes (Pinsonneault 1994) are distinguished from verb sandwiches (Fischer & Janis 1990). In verb echoes, two identical occurrences of the verb appear in the sentence, which makes it difficult to identify the base position of the verb. Verb sandwiches as described by Fischer & Janis (1990) involve a SVOV pattern, whereby the first occurrence displays the base position and the second occurrence of the verb receives an additional marking. The latter includes, for instance, an aspectual, agreement or non-manual marking or the use of classifier handshapes. Kimmelman (2012: 42) confirmed this tendency for RSL and shows that the second more marked occurrence of the verb is always placed in sentence-final position. He observed cases as (43)a) where the second occurrence of the verb is marked for aspect. He also identified examples as (43)b) where the second verb is accompanied by an intensified non-manual marking.

- (43) [RSL]
- a. CLOSE GO_{CL} THERE GO_{CL}++
‘There he is going now.’ (progressive meaning)
- face:doubtfully
- b. LOOK G-R-U-Š-A LOOK
‘He looked at the pear doubtfully.’

Furthermore, Kimmelman (2012: 33–35) discusses the heaviness of the object as another factor that might influence word order in RSL. He considers all object NPs that contain more than one sign as heavy and found that those are likely to be placed clause-finally.

Interestingly, such an effect could be confirmed for experimental data but was not found in corpus data.

In a study on SSL, Bjerva & Börstell (2016) showed that morphological complex verbs influence object position. Verbs were considered as morphological complex if they exhibit morphological reduplication, classifier handshapes, object agreement, or a special non-manual marking. Those verbs generally showed a preference for OV order.

Another well-observed fact is that sign languages make use of the morphosyntactic process of topicalization, which leads to word order variations. In order to highlight information, constituents can be moved to the sentence-initial position and are commonly marked non-manually as in (44) taken from Brunelli (2011: 172) (glosses slightly adapted).

- _____ top
- (44) BROTHER POSS₁ IX_{3a}, EVENING IX_{3a} VISIT₁ [LIS]
 ‘As for my brother, he is visiting me this evening.’

A well-researched factor that influences word order is the reversibility of the arguments. In reversible sentences involving plain verbs, both animate arguments are interchangeable and qualify for the semantic role of agent or patient as in (45)a). In non-reversible events only one argument can have the semantic role agent as in (45)b) (Pavlič 2016a: 81).

- (45) [SZJ]
- a. BOY HUG MOTHER
 ‘The/a boy hugs the/a mother.’
- b. MAN HUG TREE
 ‘The/a man hugs the/a tree.’

In reversible events, the sentence is potentially ambiguous because both arguments could be interpreted either as the agent (the one who hugs) or as the patient (the one who is hugged). If the verb appears between the first and the second argument, the sentence is no longer ambiguous and the first argument will be interpreted as the agent and the second argument as the patient. In non-reversible events, there is no such an ambiguity. Thus, MAN will always be interpreted as the agent of the sentence because the inanimate argument TREE does not qualify for the role of agent. Hence, it is frequently noticed that reversible sentences favor SVO structures, while non-reversible events favor SOV structures. This tendency was first noticed by Fischer (1975) for ASL and later confirmed by Volterra et al. (1984) for LIS, de

Quadros (1999) for Libras, Vermeerbergen et al. (2007) for VGT, Milković, Bradarić-Jončić & Wilbur (2006) for HZJ and Morales-López et al. (2012) for Spanish Sign Language (LSE). However, Johnston et al. (2007) could not find such an effect for Australian Sign Language (Auslan) and Irish Sign Language (Irish SL).

The factor of reversibility is strongly connected with the effect of animacy. In reversible situations, both arguments need to be animate for being interchangeable, whereas in non-reversible situations, the agent argument is usually animate and the patient argument is inanimate. As observed in spoken languages, animacy seems to influence word order equally in sign languages such that animate arguments precede inanimate arguments in general (Milković, Bradarić-Jončić & Wilbur 2006; Massone & Curiel 2004; Coerts 1994; Volterra et al. 1984; Sevinç & Bozşahin 2016). For emerging sign languages, Meir et al. (2017) showed that humanness can explain word order preferences. Objects marked for [+human] are generally produced first irrespective of their syntactic or semantic roles; hence, they argue for a ‘human first’ principle. The same pattern is found in a number of gesture studies. Non-signers who describe events by using gestures basically produce human arguments first (Goldin-Meadow et al. 2008; Hall et al. 2015; Hall, Mayberry & Ferreira 2013). See section 4.2.1 for a detailed discussion of these studies.

Moreover, many studies noted that word order used with locative sentences display a different word order, which seems to be highly influenced by the visual modality. In locative sentences, bigger and less mobile entities precede smaller and more mobile entities which is reflected in a ground-figure-predicate relation as in (46) from RSL (Kimmelman 2012: 37). Usually, the figure is interpreted as the subject and the ground as the object, which results in an OSV structure.

- (46) CHAIR BIG CAT SIT_{CL} [RSL]
 ‘The big cat sits on a chair.’

Moreover, Napoli et al. (2017) showed that verb meaning has an impact on word order. In Libras, extensional verbs such as THROW and CLIMB favor SOV order, while intensional verbs such as WANT and LOOK-FOR favor SVO order (Napoli, Sutton-Spence & de Quadros 2017). Sze (2011) found that verbs with a negative meaning such as DISLIKE or DETEST prefer a SOV order instead of the canonical SVO order in HKSL.

As mentioned in the previous section 3.1.2.1, there is a debate whether syntactic or pragmatic principles are determining word order in sign languages. For some sign languages it is argued that they belong to the topic prominent languages as classified by Li & Thompson (1976). It

is claimed that in these sign languages sentences are structured according to information-structural categories such as topic/comment and focus/background and that syntactic categories such as subject and object are not crucial for sentence structure (Rosenstein 2001; Janzen 1999; Deuchar 1983; McIntire 1982; Edge & Herrmann 1977; Friedman 1976). However, some sign languages such as ASL have been described as topic prominent by some researchers (Friedman 1976) or have been claimed to determine word order in syntactic terms by others (Liddell 1980). ASL is now commonly assumed to display syntactic hierarchical structures (see also section 4.2.3). Nonetheless, it is a well-known fact that information structure can influence word order (see Kimmelman & Pfau (2016) for an overview of information structure in sign languages). Across different sign languages topics are usually placed in a more left-peripheral position in the clause and are frequently accompanied by a specific non-manual marking as for instance brow raise and/or are separated from the rest of the clause by a short prosodic break as in (47) (Sze 2011). In such constructions, the non-manual marking brow raise is usually analyzed as fulfilling semantic/pragmatic functions such as signaling old/given or new information, but see Wilbur & Patschke (1999) who argue that brow raise is syntactically determined and occurs in non-argument positions associated with a [-wh]-feature.

- (47) [IX_{deaf-allowance} DEAF DEAF-ALLOWANCE IX_{deaf-allowance}]_{topic} MONEY (hesitation) MONEY
 EVERY-MONTH HAVE
 ‘About the deaf allowance, (I) get the money every month.’ [HKSL]

Contrarily to topic-like elements that appear in clause initial position, constituents or elements marked for focus are more likely to be placed sentence-finally. Wilbur (1999) argued for ASL that focused elements need to be stressed and prominent elements are thus placed in phrase-final position. Another argument for a rightward focus position comes from doubling constructions. In these constructions, wh-words or modal verbs (among other elements) occur doubled in the sentence and the sentence-final element is more emphasized compared to the first one. Lillo-Martin & de Quadros (2008) treat these cases as emphatic focus marking and argue for a syntactic focus position. In a more recent study on NGT, Legeland, Hartmann & Pfau (2018) showed that information structure can account for word order variation found in coordinated structures. They observed that word order varies in both conjuncts as in (48) (Legeland, Hartmann & Pfau 2018: 61). They argue that the constituent in the second conjunct HEARING SCHOOL is contrastively focused to S-H SCHOOL in the first conjunct and therefore, HEARING SCHOOL is moved to the specifier of a Focus Phrase.

(48) CI [GO++_{3a} S-H SCHOOL] [HEARING SCHOOL GO_{3b}] [NGT]

VO

OV

‘Because of CI, (children) go to a hard-of-hearing school (or) go to a hearing school.’

3.1.2.3 Typological observations

Napoli & Sutton-Spence (2014) reviewed 42 published articles from different sign languages which all dealt with word order to some extent. Based on these publications and their own observations, they draw six different generalizations about the order of elements within a sentence that hold for every sign language. In this section, I will shortly summarize their findings and will illustrate their claims with examples from DGS that were analyzed for this dissertation.

- Generalization 1: SOV is grammatical in all sign languages.

In a transitive sentence with two manually expressed arguments as in (49)a) and a ditransitive sentence with three different manually expressed arguments as in (49)b) all arguments can precede the verb. This is in contrast to spoken languages in which Celtic languages such as Irish illustrated in (49)c) (Dryer 2013a) show a rigid VSO order

(49)

a. POSS₁ COLLEAGUE NEW WORK LOOK-FOR [DGS]

‘My colleague is looking for a new job.’

b. FATHER_{3a} GRANDMOTHER_{3b} GARDEN _{3a}SHOW_{3b} [DGS]

‘Father shows grandmother the garden.’

c. Léann na sgairt na leabhair [Irish]

read the priests the books

‘The priests read the books.’

- Generalization 2: If an argument affects the phonological shape of V, it will precede V.

As described in the previous section 3.1.2.2, verbs such as agreement verbs and classifier predicates, which are affected by their arguments, tend to be placed sentence-finally. This

pattern is also found in DGS. In (49)b) above, the agreement verb SHOW as well as the classifier predicate THROW in (50) below are positioned clause-finally.

- (50) LATER IX_{1pl} NOTE BIN THROW_{cl} [DGS]
 ‘Later, we throw the notes into the bin.’

Generalization 2 is further confirmed by verb sandwiches (Fischer & Janis 1990). Verb sandwiches show an SVOV pattern and the second occurrence of the verb is more marked compared to the first occurrence of the verb. In my data, I found verb sandwich constructions as in (51) where the second occurrence of the verb is reduplicated and thus receives more marking.

- (51) TEACHER IX₃ ALWAYS REPEAT IMPORTANT CONTENT g-pu REPEAT++ [DGS]
 ‘Teacher always repeats important topics.’

- Generalization 3: The most common sentence type has only one new argument, which precedes V.

The most common sentence type in sign languages exhibits only one argument which precedes the verb and thus, showing SV order. In general, VS is rarely found in sign languages and is usually related to existential or possessive constructions. An example of an existential construction in DGS that displays VS structure is given in (52).

- (52) EXIST OLD BUSH [DGS]
 ‘There are old bushes.’

- Generalization 4: Larger and immobile objects tend to precede smaller and mobile objects.

As described in section 3.1.2.2, the larger and immobile object usually precedes the smaller and mobile object irrespective of the grammatical function in a clause with two NPs that expresses a locational relation. This is reflected in the figure-ground-principle (Happ & Vorköper 2006), a rule which is frequently applied to DGS sentences as illustrated in (53).

- (53) BED CHILD LIE_{cl} [DGS]
 ‘The children are lying in the bed.’

- Generalization 5: O is immediately adjacent to V.

The vast majority of sign languages show an OV or VO order where O and V are adjacent. However, OSV order is found as well. Locative constructions as described above are usually analyzed as OSV sentences. On the other hand, OSV order derives when the object is topicalized. A topicalized object moves to the sentence initial position and is usually marked by non-manuals such as brow raise, head tilts or body leans and/or a short prosodic pause. In my data, OSV marginally occurs and was either observed in locative constructions as in (53) or in cases with topicalized objects as in (54). In (54) the adverbial LATER and the object NOTE are moved to the beginning of the sentence both marked by non-manuals.

(54) $\frac{\text{ht-right}}{\text{LATER NOTE}++}$, $\frac{\text{ht-left}}{\text{IX}_1 \text{THROW}_{\text{Cl}}}$ [DGS]
 ‘As for the notes, I throw them into the garbage later.’

- Generalization 6: SVO is favored in reversible sentences with plain verbs.

Reversibility as mentioned in section 3.1.2.2 is a well-known factor that influences word order in sign languages. Reversible sentences with two animate arguments and a sentence-final verb are potentially ambiguous and thus SVO is favored since it clearly indicates the arguments as either the subject or the object. In my data, I found a reversible sentence with a plain verb that allows for an ambiguous reading as illustrated in (55). Interestingly, this sentence nevertheless shows a SOV pattern.

(55) THREE MONTH AGO IX_{1pl} PRIEST GET-TO-KNOW [DGS]
 ‘Three month ago, we got to know the priest.’

Napoli & Sutton-Spence (2014) offer two accounts, an amodal and a modal one, as possible explanations for the cross-linguistically found observations. On the one hand, the amodal account sees the generalizations as due to universal pressures on languages. On the other hand, the modal account views order in sign languages as mainly determined by the visual modality and order as a result of “what makes sense visually” (Napoli & Sutton-Spence 2014: 1). While the modal account can explain all generalizations, the amodal account covers the preference for SOV order, the adjacency of V and O and word order preferences in reversible situation to resolve ambiguities. However, the amodal account cannot explain the order found in existential and locative sentences and fails to explain why word order in sign languages is affected by phonological and semantic factors. Nevertheless, Napoli & Sutton-Spence do not conclude that word order in sign languages is determined exclusively by factors of the visual modality. As described in the previous sections the factors that affect

word order in spoken and sign languages are quite similar and it is therefore unlikely to assume that order in both modalities is determined independently. Hence, Napoli & Sutton-Spence argue in favor of two interfering pressures. On the one hand, a universal pressure of the visual and the auditory sensorimotor system that affects order in languages (spoken and signed) in general and on the other hand, modality-specific visual and manual pressures that affect order in sign languages in particular.

3.2 Agreement

3.2.1 Agreement in spoken languages

While the former sections described and discussed word order from a spoken and sign language perspective, the following section now turns to the issue of agreement. In this section, I will give some background information on agreement in spoken languages. It will be rather short and general because the focus in this dissertation will be mainly on word order and agreement in sign languages. Furthermore, agreement in spoken languages shows a lot of variation and properties, which are not directly relevant for an investigation of verb agreement in sign languages. Besides that, agreement in sign languages is one of the best-investigated phenomena in sign language linguistics; thus, emphasis is put on sign languages here. Nevertheless, I will provide some basic terms and will illustrate the main properties of the phenomenon agreement based on spoken languages.

In the literature on agreement, agreement is usually defined in the most general sense as a term which “commonly refers to some systematic covariance between a semantic or formal property of one element and a formal property of another.” (Steele 1978: 610). In addition to this rather general definition, the literature often refers to terms which are mainly based on Corbett (2003; 2006) and which are useful for describing the phenomenon agreement. Firstly, Corbett defines the controller (e.g. the subject noun phrase) as the element, which determines the form of agreement. Secondly, the form of the element, which is determined by agreement, is called the target (e.g. the finite verb). Thirdly, agreement occurs within a specific syntactic setting for instance inside the clause which is considered the domain of agreement. Fourthly, agreement is expressed as a match of features such as person or number between the controller and the target. These features have values such as 1., 2., or 3. regarding the person feature or singular, dual, plural etc. regarding the number feature. Lastly, there may be further conditions such as animacy or definiteness, which may affect the agreement relationship between controller and target.

In general, agreement is expressed i) within a noun/determiner phrase between determiner and noun, attribute and noun or possessor and possessed noun; ii) within a clause between a verb and its arguments; or iii) across a clause between an anapher and its antecedent (Wunderlich 2015).

Examples for an agreement relationship as described in i) are shown in (56)-(58). Example (56) illustrates number and gender agreement between the definite article and the noun in French (Wunderlich 2015). (57) (Tiberius et al. 2002) demonstrates agreement between an attributive adjective and a noun in Russian which match in gender, number and case features. (58) presents agreement with a possessor and possessed noun in Finnish (Wunderlich 2015).

(56) [French]

a. La filette est belle
 the.FEM.SG girl.FEM.SG is.3SG. beautiful.FEM.SG.
 ‘The girl is beautiful.’

b. Les garçons sont beaux
 the.PL boys.MASC.PL are.3PL handsome.MASC.PL.
 ‘The boys are handsome.’

(57) [Russian]

a. nov-yj avtomobil’
 new-MASC.SG.NOM car.MASC.SG.NOM
 ‘a new car’

b. nov-ye avtomobili
 new-MASC.PL.NOM car.MASC.PL.NOM
 ‘new cars’

(58) [Finnish]

- a. Taina löysi minun kirja-ni
 Taina found my.1SG.GEN book-1SG.POSS
 ‘Taina found my book.’
- b. Taina löysi heidän kirja-nsa
 Taina found their.3PL.GEN book-3.POSS
 ‘Taina found their book.’

Regarding clause-internal agreement as described in ii), the most common phenomenon is a match of person and number features between the verb and the subject as illustrated in (59) (Tiberius et al. 2002). However, agreement can be further realized on (in)direct objects and auxiliaries. A match of number features between the auxiliary and the direct object in Basque is shown in (60) (Tiberius et al. 2002). In (60)a), the direct object bears absolutive case and receives no additional marking for number, whereas in (60)b) plural is marked on the object and the auxiliary.

(59) [Russian]

- a. Mat' id-ët v muzej
 mother.FEM.SG.NOM go-3SG.PRES to museum.MASC.SG.ACC
 ‘Mother goes to the museum.’
- b. Devušk-i id-ut v muzej
 girl.FEM-PL.NOM go-3PL.PRES to museum.MASC.SG.ACC
 ‘The girls go to the museum.’

(60) [Basque]

- a. Tren-a ikus-i d-u-t
 train-DET.ABS see-PERF (3).PRES-AUX-1SG
 ‘I have seen the train.’
- b. Tren-ak ikus-i d-it-u-t
 train-DET.PL.ABS see-PERF (3).PRES-PL-AUX-1SG
 ‘I have seen the trains.’

Agreement across the clause (iii) is observed in (61) (Wunderlich 2015). In the German example, the neuter pronoun *es* in the second clause agrees with the antecedent neuter noun *Mädchen* of the first clause.

- (61) [German]
 Ein kleines Mädchen saß auf der Treppe und es lachte
 a little.NEUT.SG girl.NEUT sat.3SG on the stairs and she.NEUT laughed
 ‘A little girl sat on the stairs and she laughed.’

Referring to the Basque example (60) above, it has been observed that in some varieties of Basque the direct object does not bear absolutive case as in standard Basque shown in (60) and (62)a). Instead, the direct object receives a dative suffix *-(r)i* as in (62)b) (von Heusinger, Kaiser & Arriortua 2018: 25).

- (62) [Basque]
 a. Nik zu ikusi zaitut
 I.ERG you.ABS see AUX
 ‘I have seen you.’
 b. Nik **zuri** ikusi dizut
 I.ERG you.DAT see AUX
 ‘I have seen you.’

(62)b) has been analyzed as an instance of differential object marking (DOM) (Aissen 2003; Bossong 1985; Bossong 1991). In languages that display differential object marking some objects receive an additional marking. This could be case-marking on the object itself as in the Basque example (62)b), an additional adposition such as the marker *a* in Spanish shown in (63) (von Heusinger, Kaiser & Arriortua 2018: 26) or a morphological marking on the verb as in Swahili illustrated in (64) (Vitale 1981: 123–124). In (63)a), the direct object is human and is additionally marked by *a*, whereas such a marking with inanimate direct objects leads to ungrammaticality as in (63)c). In (64)a), the animate object is indexed on the verb (glossed as OM for object marking and SM for subject marking), while inanimate objects as in (64)b) are generally not indexed on the verb.

(63) [Spanish]

- a. Vi a Pedro
 saw.1SG DOM Pedro
 ‘I saw Peter.’
- b. Vi la casa
 saw.1SG the house
 ‘I saw the house.’
- c. *Vi a la casa
 saw.1SG DOM the house
 ‘I saw the house.’

(64) [Swahili]

- a. Juma a-li-m-piga risasi tembo jana usiku
 Juma SM-PST-OM-hit bullet elephant yesterday night
 ‘Juma shot an/the elephant last night.’
- b. risasi i-li-pigamti karibu na sisi
 bullet SM-PST-hit tree near us
 ‘A bullet hit the tree near us.’

Besides the animacy of the object other triggers for DOM have been identified in the literature including referentiality, topicality and affectedness, however, their use and extent differs cross-linguistically (Aissen 2003; Bossong 1985; Bossong 1985; Lemmolo 2010; von Heusinger & Kaiser 2010). In addition, languages vary regarding the obligation of differential object marking. In the Basque varieties, the triggers for DOM are usually connected to the animacy and referentiality or specificity of the direct object. However, in the Bizkaian dialect of Basque, verb agreement causes a differential marking of the direct object as in (65) (von Heusinger, Kaiser & Arriortua 2018: 32). 1. and 2. person direct objects will be differentially marked by the dative suffix *-ri* if the direct object agrees with the finite auxiliary as in (65)a). However, such a marking will be optional if the direct object does not agree with the infinite auxiliary shown in (65)b) and (65)c).

- (65) [Basque]
- a. Seuri eroan gure dotzut
 you.DAT carry want AUX.DITR.PRES.ABS.3SG.DAT.2SG.ERG.1SG
 ‘I want to bring you.’
- b. Seu ikusten etorri nes
 you.ABS seeing come AUX.INTR.PRES.ABS.1SG
 ‘I am coming to see you.’
- c. Seuri ikusten etorri nes
 you.DAT seeing come AUX.INTR.PRES.ABS.1SG
 ‘I am coming to see you.’

3.2.2 Agreement in sign languages

The phenomenon that some verbs can be spatially modified in the signing space based on the properties of the verb’s arguments in almost every sign language has been referred to as agreement (Bahan 1996; Emmorey, Reilly & Janis 1995; Fischer & Gough 1978; Mathur 2000; Meir 1998a; Meir 1998b; Meir 2002; Padden 1988; Rathmann & Mathur 2002; Rathmann & Mathur 2005; Rathmann & Mathur 2008 to cite a few). Agreement in sign languages is a well-studied but also controversial topic in sign language linguistics since it shows properties which are not compatible with the term and definition of agreement in spoken language as described in the previous section. In particular, this concerns i) the use and definition of space and the gestural origin of signs; ii) the division of verb types and the way they realize agreement or not; iii) the use and distribution of agreement markers; iv) the primacy of object agreement and v) the optionality of agreement marking observed in sign languages. In this section, I will describe and comment on these observations and will illustrate them with examples from DGS.

First of all, the view of space and how it is grammatically used to establish reference and to express agreement has provoked controversial discussions among sign language linguists. As described in section 2.3.2, reference is established by linking discourse referents to locations in space, which either are chosen due to the actual position of present referents or represent absent referents arbitrarily. This view is based on the R-locus analysis as presented by Lillo-Martin & Klima (1990). It has been argued that noun phrases are associated with a referential index (R-index) which is an abstract variable that is interpreted within the discourse. A referent can be linked to a point in the signing space that has been called an R-locus which

is an overt realization of an R-index. In principle, this process results in an indefinite number of R-loci, which cannot be listed in the mental lexicon. This has been referred to as listability problem and which has been the core argument against an agreement analysis (Liddell 1995; Liddell 2000; Liddell 2003; Liddell 2011). Liddell argues that points in space are locations tied to actual or imagined referents and that these locations have no morphosyntactic properties. Moreover, he claims that locations have a gestural origin and are thus not part of the grammar. Therefore, he rejects an agreement analysis and states that certain verbs indicate their arguments gestural (more on his view in section 4.4.1). Although scholars acknowledge the fact that location reference and pointing clearly interact with gestures, most agreement theories build on the R-locus analysis (Aronoff, Meir & Sandler 2005; Cormier, Wechsler & Meier 1998; Meir 1998a; Meir 2002; Rathmann & Mathur 2002; Rathmann & Mathur 2008). Aronoff et al. (2005), for instance, propose an index copying analysis of agreement. They argue that the R-loci of the noun phrases are copied onto the verb such that the noun phrase and the verb share the same referential indices, which is understood as agreement. A similar analysis within the framework of HPSG has been suggested by Cormier et al. (1998) (and see Holler & Steinbach (2018) for a recent analysis of verbal agreement in DGS based on a HPSG framework).

Agreement in sign languages centers around the observation that path movement and direction of some verbs can be modified in space depending on the verb's arguments. In contrast to agreement in spoken languages, not every verb expresses agreement by such a modification process. Padden (1988; 1990) was the first who systematically described verbs and their morphosyntactic behavior in ASL and she distinguished three types of verbs – plain verbs, agreement (inflecting)⁷ verbs and spatial verbs – based on whether they show agreement or not. Whereas agreement and spatial verbs realize agreement, plain verbs do not. Since then, this tripartite classification of verbs has been documented for several other sign languages. In the following, I will describe each of these verb types and their properties and will elaborate on how agreement is established with these verbs based on observations and examples from DGS.

Plain verbs do not change path movement or the direction of palm or fingertips in order to coincide with locations in the signing space that have been linked to the verb's arguments.

⁷ The terminology used to describe these verbs is not commonly accepted and they have been labelled quite differently in the literature such as inflecting verbs (Padden 1988), agreement verbs (Lillo-Martin 1986a; Meir 1998a; Meir 2002; Padden 1990; Pfau, Salzmann & Steinbach 2018), directional verbs (Cokely & Baker-Shenk 1980; Fischer & Gough 1978) or indicating verbs (Liddell 2000; Schembri, Cormier & Fenlon 2018). The terminology varied given the theoretical approaches the researchers have been adapted. I will use the term agreement verbs throughout this dissertation.

In other words, plain verbs do not agree with their syntactic arguments but they may inflect for aspect. Their place of articulation is phonologically specified. It can be i) on the body such as LIKE in DGS (figure 10), ii) in the neutral signing space such as the DGS verb COOK or iii) it can be anchored to the non-dominant hand such as the DGS verb PAY. In addition, plain verbs involve a specific path movement. This movement cannot be spatially modified to show agreement with subject and/or object (Hänel 2005b; Happ & Vorköper 2006; Papaspyrou et al. 2008; Schwager 2012).



Figure 10: Start- and endpoint of the body-anchored plain verb LIKE

On the other hand, agreement verbs can change their direction of movement or orientation of palm and finger tips to agree with subject and/or (in)direct object. Agreement verbs can be further divided based on whether they express agreement (i) by a modification of the path movement of the verb sign (ASK in DGS) (see figure 11), (ii) by a change in the orientation of the hand or fingertips (INFLUENCE in DGS) and (iii) by changing movement and orientation of the sign (SHOW in DGS)(Hänel 2005b; Proske 2020; Rathmann & Mathur 2002; Rathmann & Mathur 2008).



Figure 11: Start- and endpoint of the agreement verb ASK. The movement starts at a locus associated with a 3rd person subject referent and ends at the locus associated with the object (the signer) as in ${}_{3a}\text{ASK}_1$ which corresponds to ‘he/she asks me’.

Agreement with subject and/or object is established by modulating movement and/or orientation of these agreement verbs which start at the locus in space associated with the subject and which end at the locus associated with the object (Erlenkamp 2012; Hänel 2005b; Happ & Vorköper 2006; Rathmann & Mathur 2002; Rathmann & Mathur 2008; Schwager 2012). Locus establishment varies whether referents are present or not in the actual discourse. If referents are present, the chosen locus corresponds to the actual position of the present referent in space. Otherwise, if referents are not present, an abstract locus will be chosen (Papasprou et al. 2008). Agreement verbs in DGS select at least two (usually animate) arguments (subject, direct object and/or indirect object) and they assign a unique thematic role to each of the arguments (Rathmann & Mathur 2002; Rathmann & Mathur 2008).

In addition, a group of verbs called backward agreement verbs show a reversed agreement pattern compared to regular/forward agreement verbs. The path movement of these verbs such as INVITE (figure 12), ACCEPT or PICK-UP in DGS starts at the location in the signing space linked to the object and ends at the location linked to the subject. Usually, backward verbs do not constitute a separate verb type but are subsumed within the group of agreement verbs (Hänel 2005b; Happ & Vorköper 2006; Papasprou et al. 2008).



Figure 12: Start- and endpoint of the backward verb INVITE. The movement starts at the locus associated with a 3rd person object referent and ends at the locus associated with the subject (the signer) as in ${}_{3a}INVITE_1$ which corresponds to ‘I invite him/her’.

Spatial verbs have been treated independently since they do not agree with their syntactic arguments as agreement verbs but the start- and endpoint of these verbs coincide with locative arguments or adjuncts. Spatial verbs in DGS can be divided into local verbs like SIT, LIE or STAND (figure 13) and directional verbs like GO and PUT (figure 14). Directional spatial verbs involve a path movement from the source location towards the goal location, whereas local spatial verbs are signed at the location associated with the endpoint of the movement or event. Furthermore, spatial verbs (and some agreement verbs such as GIVE) involve a

classifier handshape. These handshapes are visually motivated and reflect visual-geometric or semantic properties of the involved entity (Hänel 2005b; Happ & Vorköper 2006; Schwager 2012). They represent the referent either as a whole (whole-entity classifier) as STAND shown in figure 13 or refer to the movement or handling of the entity (handling classifier) as PUT in figure 14.



Figure 13: Spatial (local) verb STAND as in ‘a person stands at a’.

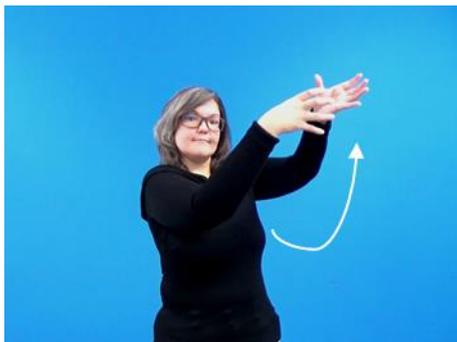


Figure 14: Spatial (directional) verb PUT as in ‘put a round object from a to b’.

Besides a manual modification of path movement and orientation, it has been argued that agreement can also be realized by non-manual articulators such as eye gaze and head tilts in ASL (Aarons et al. 1992; Bahan 1996; Neidle et al. 2000) (see also section 4.2.3). According to these authors, a change of eye gaze corresponds to object agreement, while head tilt is associated with subject agreement. However, these claims have been empirically challenged by eye-tracking studies for ASL (Thompson, Emmorey & Kluender 2006) as well as for DGS (Hosemann 2011) which both found that eye gaze is not systematically used for object agreement.

For investigating verb type influence on word order in DGS, this dissertation follows the established view and uses the fine-grained distinction of verb types as proposed by Padden (1988). However, it should be mentioned that this tripartite distinction of verb types has been debated. De Quadros (1999), for instance, distinguishes only two types of verbs: plain

and non-plain verbs based on different syntactic sentence structures she identified in clauses involving plain verbs and clauses involving non-plain verbs (see section 4.2.3 for further details). De Quadros & Quer (2008) follow her idea and distinguish between firstly, agreeing (non-plain) verbs involving spatial and agreement verbs and secondly, non-agreeing (plain) verbs. In their view, agreement is realized by a path movement which coincides with locations in the signing space that are linked either to spatial features or to person and number features. They further propose to treat backward verbs not as a subgroup of agreement verbs but as handling classifier verbs, which involve a path movement that agrees with locations and not with syntactic arguments. A verb class distinction based on the verb's place of articulation was recently proposed for DGS (Oomen 2018; Oomen 2020). Oomen distinguishes between agreeing verbs (including agreement and spatial verbs) which involve a path movement in space, neutral and body-anchored verbs. Neutral verbs are signed within the neutral signing space and body-anchored verbs are signed on or near the body. She further develops a theory of subject-drop and agreement based on these verb types, which will be presented in detail in section 4.4.3.

So far, agreement has been described as a process involving (di)transitive verbs. However, it has been argued that some intransitive verbs can be localized in such a way that they match with their argument. Such a process has been called “single argument agreement” (Costello 2015: 127) or “co-localization” (Lourenço 2018; Lourenço & Wilbur 2018) and has been analyzed as agreement by some scholars (Bos 1993; Costello 2015; Fischer & Gough 1978; Lourenço 2018; Lourenço & Wilbur 2018; Meir 1998a; van Gijn & Zwitserlood 2006). Usually, single argument agreement involves plain verbs, which are not body-anchored but are articulated in the neutral signing space. In these cases, the verb is not directed towards a neutral location in space but to a location in space which matches the nominal argument and as such expresses agreement as in (66) (Lourenço 2018: 92).

- (66) IX_{3a} WORK_{3a} TEACHER_{3a} ALL-DAY / IX₁ 1HELP_{3a} HOUSE_{3a} [Libras]
 ‘She works as a teacher all day. So, I help her with the house.’

In (66), the plain verb WORK is not articulated in the neutral signing space, but it is placed at the location in space, which corresponds to the location of the subject IX_a (‘she’). Lourenço (2018) and Lourenço & Wilbur (2018) argue that agreement is not expressed via direction of path movement or facing of the hands but via changing the location of the verb such that it corresponds to the location of the verb's argument which they call co-localization. For DGS, single argument agreement or co-localization of plain verbs has not been described in detail. A similar observation has been made by Happ & Vorköper (2006: 197–199). Plain verbs

such as BUY in DGS can be localized at a certain point in space and thus receive a spatial marking. In (67) (Happ & Vorköper 2006: 198) BUY is articulated at two different locations in space which yields the meaning that the book was bought at two different places (e.g. bookstores). In addition, Oomen (2020: 181) found instances of localization in the DGS corpus (Hanke et al. 2020) as illustrated in (68) where the verb matches the locus of the pronominal subject. In general, she found that localization of neutral verbs is more likely with animate arguments than with inanimate arguments in DGS although the latter is not completely ruled out.

(67) YESTERDAY MAN BOOK BUY_a BUY_b [DGS]
 ‘The man bought a book at two different places yesterday.’

(68) IX_a BIT g-pu LATER DIE_a
 ‘She died later.’

Furthermore, in contexts with plain verbs which usually cannot express an agreement relationship, some sign languages have developed agreement markers whose main function is to express agreement with the arguments (for an overview see Sapountzaki (2012) and Steinbach & Pfau (2007)). In DGS, the person agreement marker PAM (Bross 2020b; Macht 2016; Macht & Steinbach 2019; Murmann 2012; Pfau, Salzmänn & Steinbach 2018; Pfau & Steinbach 2006a; Pfau & Steinbach 2013; Rathmann 2003; Steinbach 2011; Steinbach & Pfau 2007) expresses agreement with subject and object by moving from the subject to the object locus and by orientating the fingertips towards the object. Moreover, it has been shown that PAM has been grammaticalized from the noun PERSON (Pfau & Steinbach 2006a; Pfau & Steinbach 2013; Steinbach & Pfau 2007). PAM can occur with plain verbs as in (69) (Steinbach & Pfau 2007: 322) and is less found with agreement verbs which can be either unmodified or modified (but see section 5.6.6 and 6.4.2 where I will show that PAM mainly appeared with modified agreement verbs in my data).

(69) MOTHER IX_{3a} NEIGHBOR NEW IX_{3b} LIKE _{3a}PAM_{3b} [DGS]
 ‘(My) mother likes the new neighbor.’

PAM usually appears in clauses with animate arguments as in (69) or at least with inanimate arguments that have a strong personal value (Murmann 2012; Murmann et al. 2013; Rathmann 2003). In addition, PAM is used with adjectival predicates as in (70) (Steinbach & Pfau 2007: 323) where it is further cliticized to the adjective indicated by a continuous movement contour, handshape assimilation and the spread of the mouthing. Besides that,

PAM occurs in reciprocal constructions and can be used to extend the argument structure of a verb.

- _____/štolts/
- (70) POSS₁ BROTHER IX_{3a} IX₁ PROUD[^]₁PAM_{3a} [DGS]
 ‘I am proud of my brother.’

Finally, there is a discussion about the position of PAM, which might be due to dialectal variations. Its position is either claimed to be sentence-final (Macht 2016; Macht & Steinbach 2019; Pfau, Salzmann & Steinbach 2018; Pfau & Steinbach 2006a; Steinbach & Pfau 2007) or preverbal, in particular preceding the object (Bross 2020b; Rathmann 2003). Macht (2016) and Macht & Steinbach (2019) showed that a preverbal position of PAM is mainly found in southern varieties of DGS. While Pfau, Salzmann & Steinbach (2018) argue that sentence-final occurrences of PAM can be analyzed as agreement marking, Bross (2020b) and Börstell (2019) argue that preverbal occurrences are instances of differential object marking (for the latter view see section 4.4.3).

Moreover, agreement between the verb and the object is obligatory which leads to a primacy of object agreement in sign languages. This is at odds with agreement in spoken languages where agreement between the finite verb and the subject is the most common phenomenon regarding clause-internal agreement. Agreement verbs which agree with subject and object such as HELP in DGS have been referred to as double agreement verbs while verbs like HATE or TRUST in DGS show agreement only with the object (single agreement verbs) (Happ & Vorköper 2006; Papaspyrou et al. 2008). Verbs that solely express object agreement usually involve contact with the body. Since the starting point of the path movement is phonological specified on the body, subject agreement cannot be expressed. The endpoint of movement, however, varies according to the location of the object and as such marks object agreement. Nevertheless, there might be dialectal variation whether signers use certain verbs as single or double agreement verbs: while INFORM (‘BESCHEID-SAG’) is mentioned as a single agreement verb in DGS in Happ & Vorköper (2006), it is identified as a double agreement verb in Papaspyrou et al. (2008). Furthermore, TRUST is an interesting case. It grammaticalized from a body-anchored plain verb into an agreement verb (Pfau, Salzmann & Steinbach 2018) which can now at least realize agreement with the object (see Meir (2012) for more information on grammaticalization from plain into agreement verbs).

A further challenge for the definition of agreement in sign languages is the fact that agreement marking is sometimes not obligatorily used. Corpus studies showed that verbs which potentially can agree with the subject and/or object argument do not always express

agreement with both arguments and either subject marking or object marking or both may be lacking (de Beuzeville, Johnston & Schembri 2009; Fenlon, Schembri & Cormier 2018). If agreement marking is lacking, the verb does not start or end at the locus associated with subject or object but starts/ends at a point in the neutral signing space. If both markers are lacking, the verb is usually used in its citation form. De Beuzeville, Johnston & Schembri (2009) showed that only 41% of agreement verbs in the Auslan corpus were clearly modified and that object agreement was less obligatory than expected. Fenlon, Schembri & Cormier (2018) investigated which linguistic and sociolinguistic factors influenced verb modification of agreement verbs⁸ based on data of the BSL corpus. They showed that sociolinguistic factors such as region or age did not affect the presence or absence of verb modification, whereas linguistic factors, such as person, animacy of the arguments, verb position or presence of constructed action, were crucial. If the agent or patient was a first-person argument (signed on or near the signers' body), it strongly favored a verb modification for the agent argument. Human and animate patient arguments favor verb modification as well. Furthermore, verbs were more likely to be modified if associated with null arguments than with overtly expressed noun phrases or when they occurred in sequences involving constructed action. Verb-final and verb-only clauses favor verb modification in contrast to non-final verbs, which show less modification. Although these results convincingly show that agreement marking is less obligatory than predicted, Oomen (2020) showed that agreement marking in the DGS corpus is quite consistently used.

3.3 Summary

Chapter 3 provided the descriptive and empirical background of word order and agreement in spoken and sign languages. In the first part of this chapter, basic word order was defined and described from a spoken language' perspective. In section 3.1.1.1, I showed that basic word order targets the order of subject and object relative to the verb in an unmarked transitive, declarative clause. However, this type of sentence is infrequently used in natural communication since subject and object are not always expressed as full noun phrases but rather as pronominal forms as soon as referents are given information in the discourse. Typological syntactic research classifies languages as SOV, SVO, VSO, VOS, OVS and OSV languages. Among these, SOV and SVO are the most widespread orders; all other others are

⁸ Since Fenlon, Schembri & Cormier (2018) work within the tradition of the indicating analysis by Liddell (1995; 2000; 2003; 2011), they call agreement verbs indicating verbs. For making reading easier, I will continue to use the term agreement verbs.

rarely found. Based on the example of German, I showed that word order classification can be challenging and tied towards the used theoretical framework. Whereas Dryer (2013a), who works within a typological framework, classifies German as lacking a basic word order, others, who follow a generative framework, define German as a verb second language in the main clause and further determine SOV as the basic word order in embedded clauses. Moreover, typological research determines word order based on the criteria of frequency of usage, distribution, simplicity and pragmatic neutrality; however, this is challenged by morphosyntactic, semantic and pragmatic factors which may lead to word order variations. In section 3.1.1.2 those factors have been described on the basis of word order variation found in the German middlefield (Bader & Häussler 2010; Müller 1999; Primus 1994; Siewierska 1993; Weskott et al. 2011). The order of arguments is thus affected by the grammatical/thematic roles, the animacy and definiteness, the discourse- and information-related status and the complexity of the arguments. In section 3.1.1.3, I reviewed how syntactic typological research demonstrated that the order of object and verb correlates with other elements in the clause such as the position of prepositions, genitives, complementizers and others.

In section 3.1.2, the question of basic word order was elaborated from the perspective of sign languages. In addition to the critical aspects of word order definition and classification in spoken languages, section 3.1.2.1 showed that defining word order in sign languages is further challenged by the fact that sign languages are visually produced languages which use manual (the hands) and non-manual articulators (torso and face) simultaneously. Subsequently, the question arises whether word or sign order is an applicable concept for sign languages. Research on word order in sign languages started with two papers by Fischer (1975) and Friedman (1976) on ASL who both contrarily argued that ASL has either a basic word order or word order is in general free. Nowadays, most researcher claim that sign languages have a basic word order and that they belong to SOV, SVO or other word order types. As for spoken languages, SOV and SVO are the most common identified word order types while other types are rare in sign languages as well. Furthermore, research on word order in sign languages showed that morphosyntactic, semantic and pragmatic factors affect word order similarly as described for spoken languages (section 3.1.2.2). Among the morphosyntactic factors, verb type has an influence such that agreement verbs and classifier predicates tend to be clause-finally as well as verbs marked for aspect and other complex verb constructions, which do also appear at the end of the clause. Animacy and reversibility are the main semantic factors, which can explain word order variation. Semantic reversible events usually use SVO order to disambiguate subject and object from each other since both

animate arguments qualify for the agent role of the clause. The structure of locative clauses also follows semantic principles since bigger and inanimate entities are usually placed before smaller and animate entities. Pragmatic factors and information structure also provide explanations for word order variations since focused elements tend to be clause-finally, while topic constructions are usually found in the left periphery of the sentence. Based on these observations, Napoli and Sutton-Spence (2014) draw six generalizations on word order in sign languages which were reviewed and compared with findings of DGS in section 3.1.2.3.

- SOV is grammatical in all sign languages.
- If an argument affects the phonological shape of V, it will precede V.
- The most common sentence type has only one new argument, which precedes V.
- Larger and immobile objects tend to precede smaller and mobile objects.
- O is immediately adjacent to V.
- SVO is favored in reversible sentences with plain verbs.

The second part of chapter 3 defined and described the process of agreement in spoken and sign languages. Starting with agreement in spoken languages, I demonstrated in section 3.2.1 that agreement is seen as a match of features (such as person and number with different values) between a controller (e.g. the noun) and a target (e.g. the verb) within a certain domain (such as the clause). Agreement is found within the NP/DP, for instance between noun and adjective, within the clause between the verb and its arguments or across the clause between an anapher and an antecedent. The most common type of clausal agreement is a match of features between the subject and the finite verb, but agreement is also found between the finite verb/auxiliary and the object of the clause. In the contexts of objects, I showed that in some languages they might receive additional markings compared to other arguments in the clause by case marking on the object, adding adpositions or by morphological marking on the verb, which is known as differential object marking (DOM). DOM is usually triggered by the animacy, definiteness, topicality or affectedness of the object but agreement marking has also been identified as a trigger.

On the other hand, agreement in sign languages usually refers to the phenomenon that the verb's path movement and direction can be modulated in the signing space depending on properties of the verb's arguments. Verb agreement in sign languages shows some unusual patterns and properties compared to spoken languages such as the (gestural) use of space, the division of verb types, the function and distribution of agreement markers, the primacy of object marking and the optionality of agreement marking. In section 3.2.2, I showed that

most sign language scholars who argue for an agreement analysis assume that referents are linked to R-loci in space which either represent the actual position of a present referent or the abstract position of a non-present referent. Subsequently, certain verbs move between these locations in order to establish agreement with their arguments. Scholars rejecting an agreement analysis view locations in space as gestural in nature and argue that verbs indicate their arguments. Proponents of an agreement analysis usually follow the traditional tripartite division of verb types (Padden 1988) that distinguishes verbs into plain, agreement and spatial verbs based on morphosyntactic grounds. Whereas agreement and spatial verbs change path movement and direction in order to agree with their grammatical or locative arguments/adjuncts, plain verbs do not undergo such changes. Other attempts suggest a division into plain and agreeing verbs (de Quadros & Quer 2008) or propose a classification into agreeing (spatial and agreement verbs), neutral and body-anchored verbs (Oomen 2018; Oomen 2020). Agreement is usually expressed with (di)transitive verbs such that the verb's movement starts at the locus associated with the subject and ends at the locus associated with the object. But recent accounts suggest a unified agreement analysis involving intransitive verbs which has been called single argument agreement (Costello 2015) or co-localization (Lourenço 2018; Lourenço & Wilbur 2018). A further argument for an agreement analysis is based on the existence of agreement markers, which have been developed in some sign languages to express agreement with the verbs' arguments. PAM in DGS (Bross 2020b; Macht 2016; Macht & Steinbach 2019; Murmann 2012; Pfau, Salzmann & Steinbach 2018; Pfau & Steinbach 2006a; Pfau & Steinbach 2013; Rathmann 2003; Steinbach 2011; Steinbach & Pfau 2007) establishes an agreement relation between the subject and the object by moving from subject to object locus with a hand orientation facing the object argument. It can appear with plain verbs and (un)inflected agreement verbs and it is either found in clause-final (Pfau & Steinbach 2006a; Steinbach & Pfau 2007) or preverbal position (Bross 2020b; Rathmann 2003). The function of PAM has been analyzed as an agreement auxiliary (Pfau, Salzmann & Steinbach 2018; Pfau & Steinbach 2013) or as a differential object marker (Bross 2020b). Further properties of sign language verb agreement, which are at odds with agreement in spoken languages, concern the primacy of object agreement and the optionality marking of agreement. Agreement in sign languages is found either between subject, object, and the verb or between the object and the verb. The latter is found with certain transitive verbs whose path movement starts close to the body such that this phonological specification prevents them from expressing subject agreement. In addition, corpus studies showed that subject, object marking is optional in sign languages,

and verbs often start or end in a neutral location in space without a clear coincidence with subject/object locus.

4 Word order and agreement in spoken and sign languages: theoretical frameworks

The previous chapter 3 described and discussed the main properties of word order and agreement in spoken and sign languages and further compared the similarities and differences in both modalities. In contrast, chapter 4 will now present the theoretical background on word order and agreement. In this chapter, I will discuss selected theories developed within different frameworks and research traditions. In the first part of this chapter, I will present approaches to word order based on spoken and sign languages and in the second part of the chapter, I will introduce selected agreement theories, which are applied to spoken and sign languages.

4.1 Approaches to word order in spoken languages

Word order is one of the most studied issues in linguistics with a long research tradition going back to early classic works such as Behaghel (1909; 1930) and Schmidt (1926). However, the beginning of word order research as an own research field is typically connected to the work of Greenberg (1963) whose prominent work also marks the beginning of syntactic typology as an own linguistic theory. Nowadays, word order is addressed in almost every linguistic theory and this chapter will give an outlook of a small sample of selected concepts (for an exhaustive overview of word order theories see Song (2012)). In general, there are two main research traditions within the field of word order research: the functional-typological approach and the generative approach. The first will be described in section 4.1.1, while the other is presented in section 4.1.2. Whereas word order is the most dominant research topic within syntactic typology, it is less prominent within generative approaches. In contrast, the optimality approach combines aspects of the two former frameworks and will be introduced in section 4.1.3.

4.1.1 Functional-typological approach

Researchers working within syntactic typology aim to find general properties shared by every language and have the goal to define and classify languages as belonging to a certain word order type as it was previously described in section 3.1.1.1. Usually, a large sample of languages is considered and research is mainly inductive. Hence, the description of categories and constructions of certain languages are not based on a priori theoretical assumptions. With regard to word order research, this implies that universal grammatical categories such

as subject, object or verb are usually rejected and semantic terms such as the notions of agent, patient and action are favored. However, in order to make research and descriptions comparable, the terms subject, object and verb are still widely used but are usually understood as broadly semantically defined (Haspelmath 2014). A further major goal in syntactic typology is to find similarities and differences across languages and to look for correlations between certain elements of a language as described in section 3.1.1.3. For instance, the position of object and verb (OV vs. VO) correlates with the order of prepositions and noun phrases as exemplified in (71) (Song 2012: 1). Korean is a SOV language and prepositions follow NPs, whereas English (see the English translation) is a SVO language and prepositions precede NPs.

- (71) mayli-ka kongwen-eyse thom-ul man-ass-ta [Korean]
 Mary-NOM park-LOC Tom-ACC meet-PST-IND
 ‘Mary met Tom in the park.’

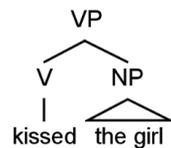
Moreover, syntactic typology tries to find explanations for such observed universal grammatical properties. Greenberg (1963) was the first who described word order patterns such as the order of object and verb compared to other word order patterns such as the order of noun and genitive. Based on his findings, he formulated word order universals and introduced the six-way typology of word order (SOV, SVO, VSO, VOS, OVS and OSV). Later Lehmann (1973; 1978) reduced this six-way typology into the distinction of OV languages vs. VO languages. He based his assumption on the observation that in OV languages, verbal elements (such as negative and causative markers) are ordered rightward to the verb, whereas nominal elements (such as adjectives and genitives) appear leftward to the noun. In contrast, VO languages show the reversed pattern. That is verbal elements are placed leftward of the verb and nominal elements are ordered to the right of the noun. Vennemann (1974) explains these observations in terms of operators and operands. Operators are dependents or modifiers such as genitives, while operands are heads such as nouns. Operators and operands are ordered differently in languages: OV languages have an operator-operand order, while VO languages have an operand-operator order. In contrast, Tomlin (1986) offers a solution for these correlations based on functional principles. He predicts that animate NPs precede inanimate NPs in transitive sentences (‘Animated First Principle’) which can be overridden by the semantic/thematic role of the NP. Thus, he assumes that the most agent-like elements precede patient-like elements and that the most agent-like elements will be identified with the subject of the sentence (‘Theme First Principle’). In addition, the branching-direction theory postulated by Dryer (1992) offers a

prominent solution for the observed word order correlations. He claims that VO languages tend to be right-branching. As a result, phrasal categories follow non-phrasal categories. OV languages, on the other hand, tend to be left-branching, subsequently phrasal categories precede non-phrasal categories. This distinction is illustrated with examples from English (72) and Korean (73) (Song 2012: 40–41). In (72), the phrasal categories (the noun phrase *the girl*, the genitive *of Mary* and the relative clause *who are singing in the room*) follow the non-phrasal categories (the verb *kissed*, the noun *friends* and the noun *girls*) in English. English is a SVO language and thus right-branching, while Korean is a SOV language and left-branching. Hence, the order of elements in (73) is reversed compared to (72).

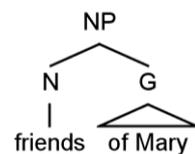
(72)

[English]

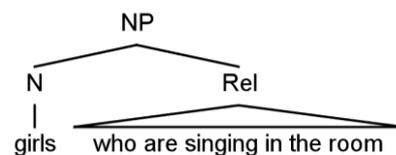
a.



b.



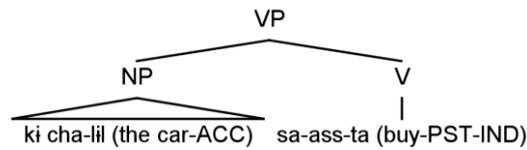
c.



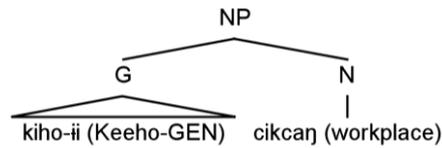
(73)

[Korean]

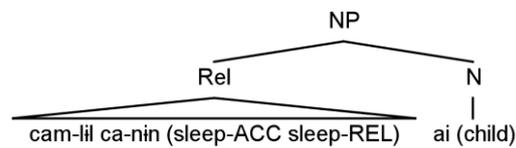
a.



b.



c.



Besides such language internal factors described above, an influential solution in terms of processing capacity was made by Hawkins (1994; 2004). He explains word-order patterns and correlations by the preference of the human parser to process certain structures as fast and efficient as possible. In general, functional-cognitive approaches do not limit their explanations on language internal factors, but also include language external factors. In addition to general processing constraints as predicted by Hawkins, further different interacting factors such as grammaticalization processes, historical explanations in terms of language contact and geographical phenomena and cultural influences on grammar are considered in explaining word order variations (Haspelmath 2014).

4.1.2 Generative approach

Theories working within a generative approach share the unified view that all languages can be described based on a universal architecture of grammar. They further assume that all languages use the same universal features, categories and syntactic operations such as movement. In this respect, generative approaches differ strikingly from typological frameworks. In contrast to typological frameworks, generative research is done deductively based on a priori assumptions and theories are further built on language-particular analyses or on a small sample of languages. With regard to word order, scholars working in generative

word order increases and parameters are no longer needed to explain word order variations. According to Kayne's view, order is now directly reflected in phrase structures which are built based on asymmetric c-command. Asymmetric c-command is seen as corresponding to precedence so that a pair $\langle x,y \rangle$ is referred to as x precedes y . Movement operations are thus necessary in order to derive word order variations across languages. Cross-linguistic research in line with Kayne's theory is most prominently done by Cinque (1996; 2005; 2010) who focused on word order variation within the nominal domain and the order of determiners, numerals, adjectives and nouns. Furthermore, Cinque is a proponent of a cartographic view on syntax. Cartographic syntax emerged in the 1990s within the antisymmetric framework and aims "to draw maps as precise and detailed as possible of syntactic configurations" (Cinque & Rizzi 2010: 51). Proponents of such an approach assume that more functional categories as presumed in former syntactic theories are needed for a fine-grained analysis of constituents and clauses. They follow the principle that each morphosyntactic feature corresponds to a unique head in the structure. The starting point for such a line of argumentation is going back to Pollock (1989) who argued that the Inflection Phrase needs to be split up in an Agreement Phrase and Tense Phrase in order to explain verb position in French. Research following this line of argumentation expanded the IP/VP domain and proposed further projections such as for tense, mood, aspect or voice. In an influential paper, Rizzi (1997) suggested a cartographic structure for the CP domain and proposed functional projections for topics and focused elements. Hence, cartographic research is interested in the number and order of functional categories. Evidence for such functional categories comes from typological word order investigations based on the order of verb, arguments and adverbials with respect to each other. Cartographic approaches share the assumption that all languages have the same number of functional projections and the same universal order. Languages vary regarding the type of movements and regarding the overtly realization of heads and specifiers.

The growing interest in word order is also reflected in the newest line of Generative Grammar. In the Minimalist Program (Chomsky 1995) the distinction between deep and surface structure as in the beginnings of Generative Grammar is abandoned. Furthermore, syntactic structures are built by two syntactic operations, namely Merge and Move (or Copy and Merge). Merge combines two objects, while movement needs to be triggered by the requirement to check certain features at the position where the element is moved. Linear (word) order is thus the result of merged objects and word order variation is explained by movement at different points in the derivation.

4.1.3 Optimality approach

Optimality Theory (OT) was developed in the beginning of the nineties and initially, it dealt mainly with issues in phonology (Prince & Smolensky 1993; Prince & Smolensky 2004). However, it was extended to other grammatical levels such as morphology and syntax and combines aspects from generative and typological approaches. With regard to word order research, OT accounts assume hierarchically organized constraints and focus on language-specific variations thereof. The main assumptions shared within OT are the following (Müller 2015: 875):

- Constraints are universal (universality).
- Constraints are violable (violability).
- Constraints are ranked (ranking).
- The competition of a linguistic expression with other linguistic expressions determines whether the linguistic expression is grammatical or not (competition).
- Linguistic expressions are candidates. A candidate is well formed or grammatical if it is the optimal candidate regarding the ranking and violation of certain constraints of a given set.

The basic architecture of an OT account of syntax is illustrated in figure 15 (Müller 2015: 878):

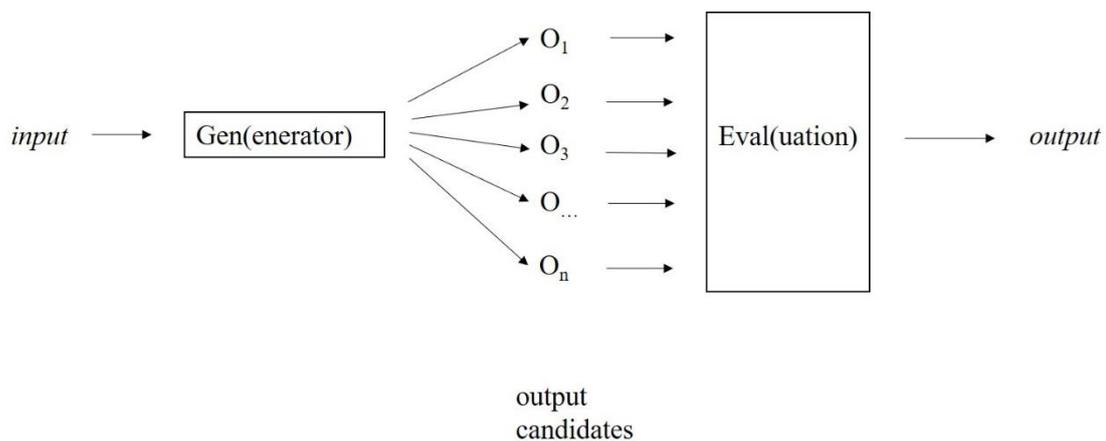


Figure 15: Architecture of OT (Müller 2015: 878)

OT accounts share that the input consists of linguistic objects but they differ regarding the exact nature of these objects. For instance, in an OT approach to German word order variation, Müller (1999) assumes a pair of D-structure and S-structure as input objects. On the basis of this input, the Generator generates the set of output candidates ($O_1 \dots O_n$) which

consist of inviolable and unordered constraints. In addition, Eval is thus responsible for setting competing constraints, which are ranked according to language-specific properties, as well as for the selection of the optimal, well-formed candidate (output).

In general, OT assumes two types of constraints: faithfulness constraints and markedness constraints. On the one hand, faithfulness constraints require that the input and output must be identical according to some property. On the other hand, markedness constraints target the well formedness of the output, which may deviate from the input. Those types of constraints are in conflict with each other; thus, they are differently ranked. The ranking of constraints is usually illustrated with the help of tables as in table 3 (Müller 2015: 879). The higher ranked constraint (A) appears on the left and is followed by the lower ranked constraints (B and C in this order) depicted on the right. Furthermore, table 3 contains five output candidates (O₁-O₅). Violations against constraints are marked with a star (*) and the number of violations is identified by the number of stars. Fatal violations that lead to an elimination of that candidate are marked by an exclamation mark (!). A pointing finger (☞) indicates the optimal candidate. In table 3, O₁ is thus the optimal candidate because it violates the lowest ranked constraint C only once.

Table 3: OT tableaux example (Müller 2015: 879)

	A	B	C
☞ O ₁			*
O ₂			**!
O ₃		*!	
O ₄	*!		
O ₅		*!	*

Based on the above-mentioned assumptions, word order variation within OT can thus be formulated as differently ranked constraints. In section 3.1.1.2, I outlined factors that have an impact on word order based on variation observed in the German middlefield. Müller (1999) is one prominent approach to modulate these variations in terms of constraints that allow for different levels of markedness. Müller assumes that the underlying word order in German is subject > direct object > indirect object, while a deviation of this order is caused by scrambling. Hence, he defines a scrambling constraint (SCR-CRIT) which itself has a sub-hierarchy of ranked constraints which are listed in (75) (Müller 1999: 795):

- (75) SCR-CRIT: In the VP domain,
- a. NOM (“nominative constraint”): [+nom] precedes [–nom] >
 - b. DEF (“definiteness constraint”): [+definite] precedes [–definite] >
 - c. ANI (“animacy constraint”): [+animate] precedes [–animate] >
 - d. FOC (“focus constraint”): [–focus] precedes [+focus] >
 - e. DAT (“dative constraint”): [+dative] precedes [+accusative] >
 - f. ADV (“adverb constraint”): [+NP] precedes [+adv] >
 - g. PER (“permutation constraint”): If α c-commands β at level L_n , then α does not c-command β at level L_{n+1}

Example (76) (Müller 1999: 799) illustrates the interaction of animacy and case in the German middlefield and shows further that the animacy constraint must be higher ranked than the dative constraint.

- (76) [German]
- a. ?*dass man diesem Einfluss die Kinder entzogen hat*
 that one this influence.DAT the children.ACC withdraw has
 ‘...that one has withdrawn the children from this influence.’
 - b. *dass man die Kinder diesem Einfluss entzogen hat*
 that one the children.ACC this influence.DAT withdraw has
 ‘...that one has withdrawn the children from this influence.’

Example (76) shows that the animate object *die Kinder* has to precede the inanimate object *diesem Einfluss* irrespective of case marking. In (76)a), the dative marked NP precedes the accusative marked NP due to the dative constraint. However, the animacy constraint is violated. In (76)b), the animate NP precedes the inanimate NP but violates the dative constraint. Nevertheless, the example is well formed. Hence, the animacy constraint (animate objects precede inanimate objects) must be higher ranked than the dative constraint (dative case precedes accusative case) as exemplified in table 4 (Müller 1999: 800).

Table 4: Animacy and dative constraint in the German middlefield (Müller 1999: 800)

Candidates	SCR-CRIT						
	NOM	DEF	AN	FOC	DAT	ADV	PER
O ₁ : diesem Einfluss ₂ die Kinder ₁ t ₂			*?				
O ₂ : die Kinder ₁ diesem Einfluss ₂					*		*

4.2 Approaches to word order in sign languages

The previous sections generally described how word order is handled within three selected theoretical frameworks based on spoken languages. Similarly, this section will discuss basic word order and word order variations in sign languages from different theoretical point of views summarized as gestural, functional/cognitive and generative approaches. In 4.2.1, I will look at a sample of gesture studies which seek to understand whether a single word order is due to modality specific aspects of sign languages or a result of a universal language pressure (Christensen, Fusaroli & Tylén 2016; Gershkoff-Stowe & Goldin-Meadow 2002; Gibson et al. 2013; Goldin-Meadow et al. 2008; Hall, Mayberry & Ferreira 2013; Langus & Nespor 2010; Marno et al. 2015; Meir et al. 2017; Napoli, Sutton-Spence & de Quadros 2017; Schouwstra, Smith & Kirby 2016; Schouwstra & de Swart 2014). In 4.2.2, I will discuss a recent paper on Auslan (Johnston 2019) subsumed under a functional, cognitive approach to word order since the main focus of his analysis lies on the communicative function and the cognitive principles of language and the influence of language external factors. In 4.4.3, I will present generative accounts on word order variation in ASL which are based on grammatical principles found in spoken and sign languages (Neidle et al. 2000; de Quadros 1999; de Quadros 2003; de Quadros & Lillo-Martin 2010).

4.2.1 Gestural approaches

Since signs and gestures use the same modality, the relationship between signs and gestures has become a growing field of research interest. On the one hand, research is interested in the similarities and/or differences between signs and gestures and on the other hand, the conventionalization and grammaticalization of gestural elements into more grammatical elements intrigues scholars. Research done at the sign/gesture interface thus offers interesting insights how the visual modality shapes linguistic structures. Since the beginning of 2000, there has been a growing literature of gesture studies within the field of cognitive linguistics that deal with the cognitive mechanisms of linguistic structure and word order within the non-verbal and visual modality. In this section, I will present a series of papers that use a similar method, a silent gesture description of different events, and which offer different explanations why SOV order is predominantly used in non-verbal communication. While the first group of studies (Gershkoff-Stowe & Goldin-Meadow 2002; Goldin-Meadow et al. 2008) conclude that SOV is the default order in the visual modality, Langus & Nespors (2010) and Marno et al. (2015) argue that single cognitive systems have word order preferences that explain the prevalence of VO/OV order. The other studies discussed in this section focus on factors that lead to word variation in gesture production: the reversible character of the situation (Gibson et al. 2013; Hall, Mayberry & Ferreira 2013; Meir et al. 2017), event type and verb semantics (Napoli, Sutton-Spence & de Quadros 2017; Schouwstra & de Swart 2014) and communicative and social interaction (Christensen, Fusaroli & Tylén 2016; Schouwstra, Smith & Kirby 2016).

4.2.1.1 SOV is the default order in visual communication

Gershkoff-Stowe & Goldin-Meadow (2002) conducted two gesture studies with English speaking students who had no prior knowledge of any sign language. In Study 1 they wanted to know whether gesture strings include some kind of consistent order and whether the communicative situation has an influence on the used order. Study 1 included 64 participants who were asked to watch video scenes involving a moving object, a stationary object and an action. Their task was to describe these videos to a partner involved in the task by using only gestures. In addition, three different communicative situations were established. Gershkoff-Stowe & Goldin-Meadow tested whether the presence of shared knowledge (both gesturer and perceiver had watched the video scenes), the provision of feedback (perceiver was allowed to provide non-verbal feedback to the gesturer and was supposed to communicate whether the described scene was understood) and whether role switching (gesturer and recipient switched roles during the session) influenced the produced gesture order. In their

analysis, they investigated the number of the produced gestures ('tokens') and the produced combination of gestures ('strings'). The results show that the number of produced gestures was influenced by a change of the communicative settings such as shared knowledge of gesturer and perceiver about the given scene, the allowance of providing feedback and the change of gesturer and perceiver role. However, gesture order was consistently used across all three different communicative situations. All participants strongly preferred an order where stationary objects were placed initially followed by moving objects and by gestures for the action. Interestingly, this order does not reflect the dominant word order of the participants' spoken L1. English, in contrast, would involve an order where moving objects precede action gestures, which are followed by stationary objects. In study 2 Gershkoff-Stowe & Goldin-Meadow were interested in whether the non-English order only appears in communicative settings. Thus, 60 participants saw the same scenes as in the first study but did not have to describe them to a second present person. Instead, they were given three drawings after each scene, which illustrated a stationary, a moving object and an action. Thereafter, participants were asked to reconstruct the presented scene. It became obvious that participants consistently prefer an order of a stationary object followed by a moving object and an action gesture when they were asked to reconstruct the scene for themselves (condition 1). In a second condition, participants were supposed to talk while placing the drawings. Interestingly, this led to an order that reflected the English word order. Hence, moving object gestures were placed before action gestures followed by stationary objects. When participants were asked to reconstruct the scene for another speaker (condition 3), the order also mirrored the English word order. Thus, Gershkoff-Stowe & Goldin-Meadow conclude that the SMA order (stationary object, moving object, action) might be a natural order in the manual modality or an order, which reflects how scenes are conceptually perceived. However, the pressure of the dominant spoken language word order when talking simultaneously affects this order.

Goldin-Meadow et al. (2008) tested two groups of speakers, each of them consisted of 40 speakers of four different languages with varying predominant word orders. Ten speakers from English, Spanish and Chinese (Mandarin) whose predominant word order is SVO and ten speakers from Turkish whose predominant word order is SOV. Those participants performed two different tasks: a gesture task and a transparency task. In the gesture task, the first group of 40 participants was asked to describe vignettes shown on a computer by using only gestures without speech. The vignettes represented 36 motion events. 20 events thereof represented actions that are usually described by using an intransitive sentence and 16 events represented actions that are usually described by using a transitive sentence. In the

transparency task, the second group of participants was asked to reconstruct the events from the gesture task by using a set of pictures. It turned out that in both tasks the preferred gesture order with intransitive sentences was actor-act, which reflects a subject-verb order while using speech. The preferred gesture order with transitive events was actor-patient-act, which is equivalent to the subject-object-verb order of spoken languages. Thus, Goldin-Meadow et al. showed that the word order of the spoken language had no influence on the perception of events. Moreover, they demonstrated that the order used with gestures is different from the order used with speech. It should be noted that in the gesture task, however, participants were asked to describe the events by using speech first and to describe them with gestures afterwards. Although participants could have been biased by their speech order (for instance, SVO while using speech), the results still showed a clear preference for a SOV order while using gestures. Therefore, the authors conclude that an actor-patient-act order is the natural order for representing events because “entities are cognitively more basic and less relational than actions” (Goldin-Meadow et al. 2008: 9166). Thus, participants mention specific entities before abstract actions. Their claim is further supported by studies on new emerging sign languages such as Al-Sayyid Bedouin Sign Language (ABSL), a sign language used by deaf and hearing members of the al-Sayyid Bedouin community in Southern Israel, and Nicaraguan Sign Language. Research on both sign languages showed that emerging systems prefer a SOV order (Sandler et al. 2005; Senghas et al. 1997).

4.2.1.2 SVO order is the preferred order of the computational system

Whereas Gershkoff-Stowe & Goldin-Meadow (2002) and Goldin-Meadow et al. (2008) conclude that SOV is the natural order in the gestural modality, Langus & Nespors (2010) argue that interaction of the cognitive systems involved in language production and comprehension explains the prevalence of SOV and SVO order in the world’s languages. The cognitive systems, which are relevant for either spoken and sign languages, comprise the conceptual system (semantics), the sensory-motor system (phonology and phonetics) and the computational system of grammar (syntax). To test in which ways those systems interact in gesture production and comprehension, Langus & Nespors conducted four experiments with native hearing Italian and Turkish speakers, whose predominant word order is either SVO (Italian) or SOV (Turkish). Experiment 1 was a replication of the study of Goldin-Meadow et al. (2008) and participants had to describe drawn vignettes with gestures. Both speakers, Italian and Turkish, used a SOV order while gesturing and hence, used an order independent of the word order of their spoken native language as it was previously shown by Goldin-Meadow et al. (2008). However, it further demonstrates that the sensory-motor system is

relevant for producing gestures and the conceptual system for conveying meaning with gestures. In Experiment 2 Langus & Nespors intended to test whether the produced SOV gesture strings are also hierarchically organized constituents. Thus, the participants described complex drawn vignettes, which would involve complex sentences containing a main and an embedded clause such as [*the man tells the child [that the girl catches a fish]*]. When describing the vignettes by using speech, both groups preferred an order according to their native language. Italian speakers placed the main before the subordinate clause and Turkish speakers placed the subordinate clause before the main clause. However, in the gesture condition, Italian and Turkish speakers produced gesture strings that do not correspond to complex sentence structures as expected for SOV languages. Thus, hierarchical structures were not found with gestures and Langus & Nespors attribute it to the fact that the computational system is not involved in gesture production. However, to see whether SOV is also the prominent order in gesture comprehension, they conducted a third reaction time experiment. Participants saw video clips where a person described simple situations with gestures. The gesture order varied according to the position of subject, object and verb and was presented in SOV, SVO, OSV, OVS, VSO and VOS order. After each clip, participants had to choose between two drawn vignettes and had to decide which of them matched the just seen gesture clip. Langus & Nespors found that SOV received the fastest reaction times for Turkish and Italian speakers despite the fact that Italians' native word order is SVO. Langus & Nespors claim that SOV is not preferred due to a modality effect but rather due to the fact that the computational system is again not relevant. Finally, in a fourth comprehension experiment, participants were presented with audio clips that consisted of three artificially synthesized prosodic flat words (in either Italian or Turkish) that described a simple situation. The order of these word strings varied and appeared in SOV, SVO, OSV, OVS, VSO and VOS order. After hearing each clip the participants had to pick one out of two drawn vignettes and had to decide which of them fitted to the content of the clip. Reaction times were measured and it was found that both groups elicited the fastest reaction times when the presented order corresponded to the order of their native spoken language. SOV elicited the fastest reaction times for Turkish speakers and SVO for Italian speakers. It proves that both groups relied on the computational system when they heard words of their native language. Furthermore, on average, both speaker groups performed faster when the subject was in initial position (SVO and SOV) and when the object followed the verb (SVO, VOS, VSO). Langus & Nespors presume that the computational system prefers a VO order. Taken together, the authors conclude that the interaction of the conceptual system (responsible for the interpretation of meaning) with the sensory-motor system (responsible for the production and

comprehension of sounds and signs) explains the preference for SOV order observed in gesture production and comprehension. Although the computational system that builds up sentence structure and generates grammatical relations is not used while producing and comprehending gestures, it is, however, involved in speech comprehension. Furthermore, it shows a preference for a contrary VO order. Hence, Langus & Nespors conclude that SVO order is used whenever a lexicon is established and syntactic (complex) structures are involved in production or comprehension since those trigger the use of the computational system.

In Marno et al. (2015) the same material was used as in Langus & Nespors (2010) to test whether a shared lexicon indeed influences the choice of gesture order. They predict that SOV is the preferred order in spontaneous gesture production, while SVO is used when communication is based on a consistent lexicon. Marno et al. asked Italian (SVO) and Persian (SOV) speakers to describe 16 of the vignettes on the basis of a gesture repertoire that the participants had been taught before. They found that Italian and Persian speakers both used SVO order predominantly and conclude that acquiring a stable gesture lexicon is one of the factors that drives word order choices.

4.2.1.3 Reversibility and animacy affecting word order

Gibson et al. (2013) predict that the semantic character of the situation can explain the SOV/SVO variation found in the world's languages. In semantic reversible sentences, both entities of the event are human/animate and can be interpreted as the subject of the sentence. If SOV order was used in such reversible sentences, both entities would precede the verb which would lead to an ambiguous reading. The choice of SVO order would disambiguate those situations by indicating the first entity as the subject of the sentence. Thus, Gibson et al. predict a shift towards SVO order in semantic reversible situations. In three experiments they tested whether such an effect is found in English (SVO), Japanese (SOV) and Korean (SOV) speakers. The participants' task was to describe transitive events which varied whether the patient of the event was human or inanimate so that the event was either semantically reversible or not. The participants described the scenes by using speech or gestures. In the speech condition, English speakers consistently choose SVO order when describing the scenes. However, in the gesture condition, they chose SOV order while describing non-reversible situations and SVO order while gesturing reversible situations. In contrast, Japanese and Korean speakers chose SOV order in both speech and gesture conditions; thus, the type of event did not determine the choice of order. In a further experiment, Japanese and Korean speakers were asked to describe situations that are more complex such as *the old*

woman says that the fireman kicks the girl. Gibson et al. found that Japanese and Korean speakers are more likely to produce SVO order in the embedded clause when it was semantic reversible. The authors explain their data and the variation between SOV and SVO within a rational communication theory and argue for language transmission operating on a noisy-channel.

A speaker wishes to convey a meaning m and chooses an utterance u to do so. This utterance is conveyed across a channel that may corrupt u in some way, resulting in a received utterance \tilde{u} . The noise may result from errors on the side of the producer, external noise, or errors on the side of the listener. The listener must use \tilde{u} to determine the intended meaning m . The best strategy for a speaker is thus to choose an utterance u that will maximize the listener's ability to recover the meaning given the noise process. (Gibson et al. 2013: 1080)

Their noisy-channel hypothesis predicts that speaker and listener will choose a structure that will have the least risk of being interrupted and affected or getting lost while being transmitted. In the case of reversible situations, an ideal speaker or listener would thus avoid a SOV structure to minimize meaning difficulties and to reduce communication loss.

Hall, Mayberry & Ferreira (2013) also focused on the reversible character of the situation and replicated some of the findings by Gibson et al. (2013). However, they explain the word order variation found in reversible situations in terms of role taking. In their study English speakers described video clips, which depicted transitive reversible and non-reversible events using gestures. All clips involved a human agent, a transitive action or a human or non-human patient. As in the study of Gibson et al., Hall, Mayberry & Ferreira found that SOV was the most common order in non-reversible events and that SVO was the preferred order in reversible events. However, they also observed that other orders such as OSV, OSVO, SOSV and SOSVO were more common in reversible situations than in non-reversible situations. Furthermore, they identified some kind of role taking while describing the events. In general, participants take on the role of human entities and do not slip into the role of non-human entities. Especially while performing an action gesture, participants usually slip in the role of the agent. In the case of a reversible situation with a human agent and a human patient, using SOV order would lead to a role conflict. First, the participant takes on the role of the agent, second, the role of the patient and thirdly needs to switch the roles in order to perform the action from the agent's point of view. This need of switching back roles is referred to as role-conflict. Therefore, gesturers choose orders that avoid the presence of a human patient preceding the action. SOV order is thus less preferred in reversible situations, while SVO as well as other orders such as OSV increase.

Meir et al. (2017) presented the first study which investigated the interaction of word order variation and the semantic type of situation in young sign languages as well as in gesture production. On the one hand, they compare ABSL, ISL and Kafr Qasem Sign Language (KQSL), a sign language used in the town of Kafr Qasem in central Israel. On the other hand, they include Hebrew (SVO), Turkish (SOV) and Arabic (SVO in the respective dialect) speakers in their investigation. As in the studies of Gibson et al. (2013) and Hall, Mayberry & Ferreira (2013), the participants described clips which involved transitive and ditransitive events to an addressee and the scenes varied whether they entailed inanimate or human patients. Signers used their native sign language to describe the scenes, whereas the speakers were asked to use gestures. Since clauses with two human entities are potentially ambiguous, Meir et al. hypothesized that word order will be used consistently in those sentences as one mechanism to clearly indicate the respective argument. In line with the previous presented studies, they found that clauses with inanimate objects predominantly had SOV order across all groups. In contrast with their expectations, clauses with human objects showed various orders though and had no consistently used word order across the groups. For instance in clauses with human objects the most common used word order was SOV for KQSL signers and Turkish and Arabic speakers. SVO was the preferred order used by Hebrew speakers and ISL signers, while ABSL signers performed mainly OSV clauses. Meir et al. claim that the choice of order is not determined by the semantic/syntactic roles of the entities but by a 'human first' principle. This principle states that human entities have to be introduced before inanimate entities irrespective of their semantic role as agent or patient or their grammatical notion of subject or object. However, the 'human first' principle can predict the position of the subject and object but fails to assume a position of the verb. Based on the results of former gesture studies, Meir et al. thus presume that verbs appear clause-finally in visual communication since either entities are more salient and thus introduced before the verb or the semantic characteristics of the verb might play a role (see the next section 4.2.1.4 for further explanations). However, these assumptions can explain the prevalence of SOV order and OSV order but cannot account for the observed SVO order. Meir et al. thus assume that the preferred SVO orders might result from interferences of the dominant spoken word order.

4.2.1.4 Event type and verb semantics affecting word order

Schouwstra & de Swaart (2014) investigated whether event type and semantic characteristics of the verb (extensional events and intensional events) can explain the preference for a SVO or SOV order. Extensional events are usually described with transitive verbs that involve

some kind of action through space like *kick* or *throw*. The direct object of these verbs refers to concrete and existent objects independent of the event. On the other hand, intensional verbs (Forbes 2013) such as *think*, *admire* or *search* have a direct object which is less specific or non-existent and thus more abstract and dependent on the action. Schouwstra & de Swaart hypothesize that extensional events with concrete and independent objects are described with SOV structures. In contrast, intensional verbs are dependent on the object; hence, the verb has to precede the object and these events are described with SVO order. Their gesture study involved a picture description task performed by 16 Dutch speakers (a SVO language) and 19 Turkish speakers (a SOV language). The participants described the meaning of 20 pictures referring to extensional events and 20 pictures referring to intensional events by using only gestures without speech to the experimenter. All patients or objects on the pictures were inanimate to avoid the reversibility effect found in the previous discussed studies. Furthermore, to avoid an influence of the left-right order of the elements in the pictures, the pictures were shown twice in original form and mirrored. As expected, SOV was the preferred order for extensional motion events, while SVO was the preferred order for intensional events irrespective of the participants' dominant spoken word order. Based on these findings the authors conclude that word order is not strictly determined by syntactic rules but rather by semantic or pragmatic principles. They argue against the view that word order is a reflection of how information is represented mentally as for instance Goldin-Meadow et al. (2008) concluded. Instead, different factors are responsible for various linearization options. On the one hand, pragmatic rules such as the 'agent first' principle (Jackendoff 2002) explain S initial orders. On the other hand, event semantics and extensional verb meaning cause the preference for SOV order, while SVO order arise due to communicative pressures as show by Gibson et al. (2013).

Napoli, Sutton-Spence & de Quadros (2017) replicated the study by Schouwstra & de Swaart (2014) and adapted it to Libras which has been described as a SVO order language in previous work. They tested eleven native signers of Libras using the same material as Schouwstra & de Swaart. The extensional events included the predicates *swing*, *throw*, *climb*, *eat*, *carry*, *drop*, *paint*, *hang* (*on a washing line*), *cut* (*with scissors*) and *slice* (*with knife or pizza wheel*). The intensional events included the verbs *knit*, *want*, *look for*, *build*, *dream of*, *bear*, *sculpt*, *think of*, *see* and *draw*. Based on 188 responses, Napoli, Sutton-Spence & de Quadros found that intensional verbs favored (S)VO order as expected. Furthermore, they showed that extensional verbs mainly appeared in (S)OV order which deviated from the basic SVO order of Libras. They thus demonstrate that semantic effects strongly interfere with word order in gesture as well as in

sign production and conclude that the distinction between intensional and extensional events might be caused by the iconic nature of the visual modality.

4.2.1.5 Social and communicative interaction affecting word order

The previous studies presented above focused on factors that are internal to language and/or cognition. The three experiments described in Christensen, Fusaroli & Tylén (2016), however, show that external factors such as environmental and social-interactional constraints have an impact on linguistic structure and especially on produced gesture order. The authors investigated the order of simple transitive events by using a picture description and picture selection task with two participants facing each other to allow for a more communicative situation. The first experiment investigated whether different event types have an impact on gesture order and led to similar results as the study of Schouwstra & de Swaart (2014). They showed that object manipulation events are produced with SOV order, whereas object construction events use a SVO structure. Object manipulation events involve referents that have to be present before an action can be performed on or by them (such as in sentences like *the doctor eats the cake*). As a result, objects precede verbs. In object construction events, the object is dependent on the action as in sentences such as *the doctor bakes the cake*. In these kinds of events, the agent performs an action that is responsible for the object to be existent. Hence, verbs need to precede objects. The second experiment investigated the effect of social-interactional forces on gesture order. They tested whether participants re-use the interlocutor's previous choice of constituent order resulting in an effect of interactive alignment (Pickering & Garrod 2004). They showed that participants tend to align their gesture order with the order previously used by the interlocutor. The third experiment tested whether frequency and distribution of a presented order might lead to a conventionalization of the produced order. They hypothesized that if one order is much more frequent compared to the other, the relative more frequent or salient order will be generalized and conventionalized. In order to test that, the frequency of the presented picture stimuli was manipulated resulting in 80% of manipulation events and 20% of construction events for one group of participants and vice versa for the other group. Their results show that participants who were presented with more manipulation events tend to generalize SOV order, whereas the participants who saw more construction events generalized SVO structure. Moreover, the authors observed an effect of alignment. The more frequent an order had been seen and the more this order had aligned with the previous produced order by the interlocutor, the greater was the probability for this order to be conventionalized. Christensen, Fusaroli & Tylén (2016) could show that visual communication and order is

thus not only determined by characteristics of the event but also by environmental and social-interactive factors.

The idea that order is shaped by conventionalization and communicative interaction was again tested by Schouwstra, Smith & Kirby (2016). They used a similar method of a picture description and picture selection task as Christensen, Fusaroli & Tylén (2016) and assigned participants in dyads. Participants alternated between the role of an actor who described intensional and extensional events based on pictures and the role of an interpreter who selected a picture which matched one of the described event types. Furthermore, the number of pictures representing intensional and extensional events varied according to each condition. The results show that the order which is conventionalized over rounds is dependent on the frequency of usage and less dependent on the semantic character of the event. Word order thus becomes more regular over time and semantic factors diminish.

4.2.2 Functional and cognitive approach

In this section, I will discuss a recent published paper on word order in Auslan based on corpus data (Johnston 2019). In his data, every possible word order pattern was attested; thus, Johnston rejects the idea that grammatical categories and regularities are responsible for structuring word order. Instead, Johnston argues for semantic and pragmatic factors, language contact and the way entities are visual represented as the determinants for word order in Auslan. I will show that this is not reflected in my data; however, I will discuss his main claims in the following but will not come back to his theory during the later discussion.

Johnston analyzes constituent order of Auslan within a broadly understood cognitive-functional, constructional and usage-based framework. He sees language as an interaction of sign, speech and gesture and treats all linguistic units for instance words, phrases or clauses as constructions, namely symbolic units which constitute a form-meaning pair. On the one hand, the form of symbolic units is regularized over time and on the other hand, the meaning is conventionalized within a language community based on its frequent use in similar contexts. Johnston defines clauses as presented in VanValin & LaPolla (1997). There a clause is made up of a 'nucleus' which contains the predicate(s) of the clause and a 'core' which contains the nucleus and the argument(s) of the predicate(s). Predicates are symbolic units which profile as process, activity, state or event and arguments are symbolic units which profile things or attributes of things. Adjuncts belong to the periphery of the clause. Semantic, pragmatic or syntactic factors determine the order of the elements within the

clause. Therefore, Johnston understands constituent order as the conventionalization of a specific position in the sentence with an element that has a specific grammatical relation.

Clauses and grammatical relations in the Auslan corpus are identified based on semantic labels. In clauses with two participants one argument was labelled A ('actor/agent') and the other P ('patient') and in clauses with one participant the argument was labelled S ('single argument'). The corpus analysis revealed that every logical possible order of A, P and S was attested. 40% of all clausal constructions were single core signs, i.e. a verb sign in transitive and intransitive clauses or a noun or adjective sign in verbless attributive clauses. In transitive clause constructions with overtly expressed arguments, the most frequent orders was an AVP order, which corresponds to the SVO order in English. Furthermore, VP order with one omitted argument was frequently observed in transitive clauses. In intransitive clause constructions the preferred order was SV.

Johnston discusses some observations based on the presented data. First, he noticed that the behavioral properties observed with grammatical relations cross-linguistically, as for instance argument omission, seem to be lacking in Auslan. Furthermore, he showed that half of the clauses do not exhibit a verb modification in the case of argument or classifier verbs. Modification was mainly found in clauses that involved some kind of enactment or constructed action. In these clauses, signs were modified in space in order to be directed towards real or imagined participants. For Johnston, this demonstrates that signers use a strategy which he calls 'showing': "Signers could be said to be showing the interlocutor the relationship between referents and the action, or how an action was performed, through indexing or enacting; rather than telling the interlocutor how they must interpret the utterance..." (Johnston 2019: 983).

Johnston concludes that constituent order or morphological marking are not the determining devices to indicate and distinguish S, A and P arguments. For him utterance context (including space in which signs are articulated and/or with reference to it they are modified), given information and real-world knowledge are crucial for the interlocutors to infer the intended meaning. In addition to semantic and pragmatic factors such as animacy, topicality and information structure, other aspects such as spatial iconicity, the use of constructed action and/or the visual representation as well as the strategy of 'showing' indicates arguments and determines their order. According to Johnston, the observed fact that A arguments are mainly introduced before P arguments can be traced back to the influence of the surrounding spoken language English and is caused by language contact.

As I will show in section 5.6 and will discuss in chapter 6, Johnston's findings are in contrast to my observations. According to my data, subjects usually precede objects, the position of the object depends on verb type, and agreement marking interacts with word order since unmodified agreement verbs prefer VO order. Despite that, it is a well-known fact that sign languages may show various word orders due to verb doubling or argument drop. Furthermore, it is well attested that animacy of the arguments and information structure may have an effect on order. Even methodological reasons such as text sort of corpora might explain the variability of orders. Nevertheless, more research is required to investigate whether the attested AVP and VP orders in transitive clauses are due to spoken English influence or whether their frequency can be explained due to grammatical regularities. Since my data speaks for an argumentation due to the latter, I will not come back to Johnston's account.

4.2.3 Generative approaches

Most of the theoretical and formal approaches to word order in sign languages are based on the investigation of ASL, while theories of other sign languages are still underrepresented. Hence, this section mainly describes accounts proposed for ASL and I will briefly illustrate how basic word order and word order variations are accounted for by assuming hierarchical structures and syntactic operations such as movement. I will further discuss how the observed asymmetry of plain and agreement verbs previously described in section 3.1.2 is handled from a generative point of view since this will be relevant for the further discussion of verb types and clause structure in DGS.

Neidle et al. (2000) assume that ASL has SVO as its basic word order and they argue that clause structure of ASL is hierarchically organized. They present the phrase structure of ASL as ordered in (77)⁹ (Neidle et al. 2000: 3) which is based on arguments published in a series of papers from their research group (Aarons et al. 1992; Aarons et al. 1994; Aarons et al. 1995). Their analysis builds on the use and spreading of non-manuals, which they see as direct manifestations of syntactic structures.

⁹ Note that this structure deviates from the order of functional projections assumed for spoken languages, where AgrSP is usually located above TP.

The structure (below TP) illustrated in (77) has been verified by other scholars such as Petronio (1993) although she had different assumptions and provided alternative evidence based on the position of modals, adverbs, negatives or auxiliaries. However, there is disagreement regarding the position of SpecCP in ASL. While Neidle et al (2000) claim that SpecCP is rightward, others have argued that the position of SpecCP is on the left as in spoken languages (Petronio & Lillo-Martin 1997; Petronio 1993). Word order patterns deviating from the basic SVO structure in ASL, such as SOV order in contexts of agreement verbs, classifier verbs and verbs indicating aspect marking, have been either analyzed as movements to topic or focus projections in the clause (Petronio 1993; Lillo-Martin & de Quadros 2008; Aarons 1994) or as object shift (Matsuoka 1997; Braze 2004; Chen Pichler 2001). The latter implies object movement to a higher functional projection preceding the verb and thus can explain the preference for SOV order. This asymmetry in word order preferences observed for plain verbs (SVO) and agreement verbs (SOV) as well as differences in placement of negatives and auxiliaries and the licensing of null arguments of plain and agreement verbs has been analyzed as involving two different phrase structures for plain and agreement verbs in Libras and ASL (de Quadros 1999; de Quadros 2003; de Quadros & Lillo-Martin 2010). De Quadros (1999; 2003) works within the antisymmetry framework proposed by Kayne (1994) (see further section 4.1.2) and assumes a Specifier-Head-Complement order. In contrast to the structure in (77), she sticks to the order of functional categories as presumed for spoken languages and assumes an [AgrSP [TP [AgrOP]]] ordering. She identifies SVO as the basic word order of Libras but notices differences between plain and agreement verbs: Firstly, plain verbs are ungrammatical in clauses with SOV order, while other verb types such as agreement verbs associated with certain non-manuals allow for preverbal objects as in (79). Secondly, a sentential negative element can be placed between subject and verb with non-plain verbs but not with plain verbs as in (80). Thirdly, an auxiliary can be used with plain verbs but not with other verb types (81). Finally, null arguments show different licensing patterns regarding plain and agreement verbs (all examples taken from de Quadros (2003)). Hence, she proposes that plain and agreement verbs differ regarding their phrase structure. Whereas plain verbs project a simple phrase structure as in (82) (de Quadros 1999: 166), agreement verbs project an expanded IP structure as in (83) (de Quadros 1999: 167).

(79) [Libras]

a. *JOHN SOCCER LIKE (SOV; plain verb)

'John likes soccer.'

b. $\frac{\text{eg}}{\text{JOHN}_a \text{ TV}_b \text{ aWATCH}_b}$ (SOV; agreement verb)

'John watches TV.'

(80) [Libras]

a. $\frac{\text{neg}}{\text{*JOHN NO DESIRE CAR}}$ (plain verb)

'John does not like the car.'

b. $\frac{\text{neg}}{\text{JOHN}_a \text{ NO aGIVE}_b \text{ BOOK}}$ (agreement verb)

'John does not give the book to (her).'

(81) [Libras]

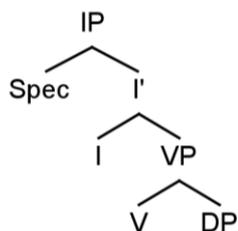
a. $\frac{\text{eg} \quad \text{eg} \quad \text{hn}}{\text{IX}_a \text{ JOHN}_a \text{ IX}_b \text{ MARY}_b \text{ aAUX}_b \text{ LIKE}}$ (plain verb)

'John likes Mary.'

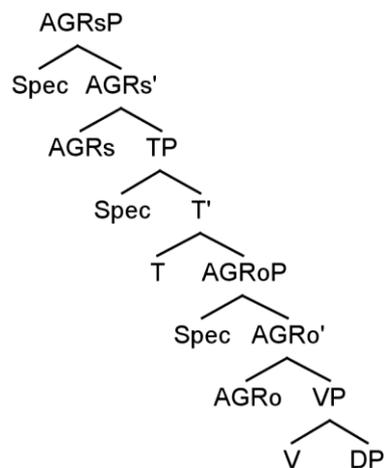
b. $\frac{\text{eg}}{\text{*JOHN}_a \text{ MARY}_b \text{ aAUX}_b \text{ aMEET}_b}$ (agreement verb)

'John meets Mary.'

(82) Phrase structure with plain verbs in Libras (de Quadros 1999: 166)



(83) Phrase structure with agreement verbs in Libras (de Quadros 1999: 167)



Although the presented arguments by de Quadros (2003; 1999) are based on observations from Libras, she assumes that her theory can be applied to other SVO languages such as ASL (the latter is argued for in de Quadros & Lillo-Martin (2010)). In sum, this section showed that basic word order in sign languages can be formulized within generative theories to syntax by assuming hierarchical organized structures. However, scholars differ regarding the number of functional projections and their ordering.

4.3 Approaches to agreement in spoken languages

The second part of chapter 4 now shifts towards theoretical approaches to agreement. In the following, I will introduce two selected approaches based on spoken languages: the typological approach and the Minimalist Program. I chose those theories since both are relevant to understand the phenomenon of sign language agreement presented in section 3.2.2 and have influenced theories on agreement in sign languages, which I will present in section 4.4. Agreement as modeled within a canonical typological approach differs strikingly from the definition of agreement within the Minimalist Program. Whereas the former present rules and conditions to describe the whole range of characteristics of the phenomenon agreement, minimalism defines agreement as a syntactic process of feature checking.

4.3.1 Typological approach

As with word order, the typological approach compares and analyzes agreement and its properties on the basis of several unrelated languages. The following descriptions are mainly based on the work by Corbett presented in his textbook on agreement published in 2006. In contrast to a statistical typological approach, which would define the most common observed pattern across languages as the standard case (the same as it is mostly done within typological word order research), Corbett pursues a canonical approach of agreement. This implies that general rules and conditions are formulated which offer a range of description and characterization possibilities of the respective phenomenon. The standard or best examples are those examples which “are most closely matching the canon” (Corbett 2006: 9). However, this approach does not imply that the canonical examples are the most frequently observed cases. Corbett (2006: 8–27) offers gender agreement within the noun phrase in Italian illustrated in (84) as an example of canonical agreement.

- (84) [Italian]
- a. *il* *nuov-o* *quadr-o*
 DEF.M.SG new-M.SG picture(M)-SG
 ‘the new picture’
- b. *i* *nuov-i* *quadr-i*
 DEF.M.PL new-M.PL picture(M)-PL
 ‘the new pictures’
- c. *la* *nuov-a* *tel-a*
 DEF.F.SG new-F.SG painting(F)-SG
 ‘the new painting’
- d. *le* *nuov-e* *tel-e*
 DEF.F.PL new-F.PL painting(F)-PL
 ‘the new paintings’

In the following, I will describe the canonical properties of agreement observed in (84) as defined by Corbett (2006). Firstly, with regard to the properties of the controller, it is obvious that the controller (the noun) is present rather than absent in (84)a)-(84)d). In addition, the features (gender and number) are overtly expressed on it. The part of speech to which the controller belongs to is not relevant since it is more informative to formulate the agreement

relationship in terms of head and its modifier than in terms of noun and adjective. Secondly, concerning the canonical agreement properties of the target (the adjective in the examples above), agreement is expressed by affixes bound to the target (*-o*, *-i*, *-a*, *-e*). Furthermore, the target needs to be obligatorily marked. This marking is expressed by regular inflectional morphology, e.g. affixation rather than suppletion and shows alliterative agreement. The latter implies that the form of the agreement marker on the target is identical to the form of the agreement marker on the controller. Additionally, agreement marking is productive; thus, each target of a given type must show this agreement pattern. Referring to the examples above, this implies that every adjective must show gender and person agreement. Moreover, the target has a single controller and does not agree simultaneously with more than one controller. As the same with the controller, the part of speech of the target is irrelevant. Thirdly, regarding the domain of agreement, agreement in the above-mentioned examples is asymmetric since the gender and number features of the adjective depend on the features of the noun and not the other way round. In addition, agreement happens locally within the phrase. Fourthly, with respect to features, gender is defined as canonical by Corbett because it is an inherent lexical feature. Moreover, all features are matching each other and the form and value of these features is not open for choices.

In sum, a typological canonical approach to agreement thus describes agreement patterns from various perspectives and formulates a range of principles how to characterize the phenomenon. In the next section, I will show that agreement from a minimalist perspective is modelled quite differently in terms of a syntactic feature checking process.

4.3.2 Minimalist Program

The Minimalist Program is part of the generative theory of grammar and was initiated by Chomsky (1993; 1995). However, it was expanded and changed during the years in such a way that it has ended up in many different approaches since the beginnings. The key idea of minimalism is to develop a model of language that is built on simplicity and assumes a minimum of syntactic operations and predefined theoretical claims. Here, I will give a basic stretch of the key assumptions relevant for the understanding of agreement and will show how agreement is modelled within the Minimalist Program.

In the architecture of minimalism, syntax is linked with two cognitive systems: the conceptual-intentional (CI) system and the articulatory-perceptual (AP) system. The first interfaces with the Logical Form (LF), which contains all relevant information responsible for the meaning of an utterance, while the second interfaces with the Phonological Form

(PF), which represents the articulation and perception of the utterance. Within the Minimalist Program, syntactic objects (sentences) are derived as follows: Lexical items are taken from the lexicon and enter the numeration, which contains a lexical item and a number how often the lexical item is selected. As the lexical item is included in the derivation, the number is reduced; thus, the numeration has to be empty at the end of the derivation otherwise the derivation would fail. A certain syntactic structure is built by the application of two basic syntactic operations, namely Merge and Move. A simplified illustration of the architecture of grammar within minimalism is given in figure 16.

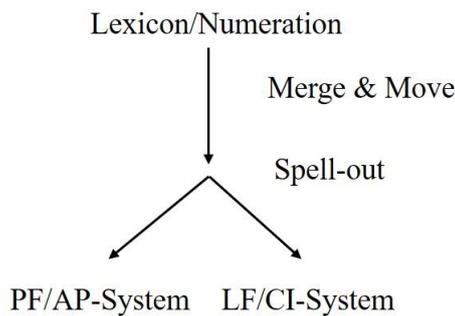


Figure 16: Architecture of grammar in the Minimalist Program

Regarding Merge, it takes two elements α and β and combines them to a more complex structure, which receives a label that identifies the properties of the new structure as in (85).

$$(85) (\alpha, \beta) \rightarrow \{\alpha/\beta \{\alpha, \beta\}\}$$

Move¹¹, on the other hand, is a syntactic operation, which combines two operations: Copy and Merge. An element is copied and merged with another element and leaves a copy behind. This further requires a deletion process; otherwise, the derivation would contain both instances, the copy and the original element. Consequently, the derivation would crash. Furthermore, this derived structure is then spelled-out at a certain point at the derivation and send to the two interfaces PF and LF.

The key assumption of the Minimalist Program involves grammatical features which can be divided in semantic interpretable, valued features and formal uninterpretable, unvalued features hosted by heads as listed in table 5 (Al-Horais 2013: 92).

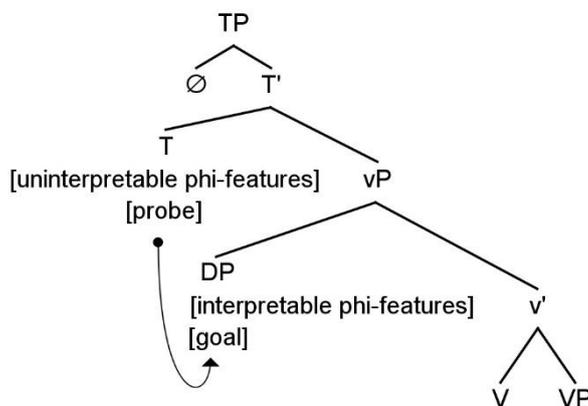
¹¹ In the beginning of minimalism, movement was triggered by the need of checking features such as case or phi-features, while in newer frameworks since Chomsky (2000), movement is seen as a requirement to satisfy the uninterpretable EEP (Extended Projection Principle) feature.

Table 5: Interpretable and uninterpretable features in minimalism (Al-Horais 2013: 92)

Uninterpretable	Interpretable
Φ -features ¹² on T, v, C....	Φ -features on DPs
tense features on V	tense features on T
case features on DP	
EPP features (D) on T, C, v, Neg...	

Agree is seen as feature-checking process between a probe, which has uninterpretable, unvalued features and a matching goal, which has interpretable, valued features¹³. The probe carrying uninterpretable, unvalued features looks for the next suitable goal with matching interpretable, valued features in order to value its own features. This process takes place within a specific syntactic domain, the c-command domain as shown in (86).

(86)



The typological and the minimalist approach thus differ strikingly in the way they model agreement, but both significantly influenced the analysis of agreement in sign languages. In the next section, I will thus move on with presenting accounts of sign language verb agreement and discuss the differences between them.

¹² The features gender, number and person are called phi-features in minimalism.

¹³ Note that different terms are used in minimalism compared to the terms used in typological research and defined in section 3.2.1 and 4.3.1. The probe corresponds to the target and the goal corresponds to the controller (Corbett 2006: 124–125)

4.4 Approaches to agreement in sign languages

In this section, I will present the main approaches to agreement in sign languages which differ in the questions what agreement triggers and how agreement could be theoretically implemented. In the following, I will introduce selected theories which can be broadly assigned to one of the following approaches: 1) gestural approaches (Johnston & Schembri 2007; Liddell 1995; Liddell 2000; Liddell 2003; Liddell 2011; Schembri, Cormier & Fenlon 2018); 2) thematic approaches which combine semantic and syntactic principles (Bos 2017; Meir 1998a; Meir 1998b; Meir 2002); and 3) generative approaches which, on the one hand, focus on the realization and checking of morphosyntactic features (Neidle et al. 2000; Oomen 2020; Oomen & Kimmelman 2019; Pfau, Salzmann & Steinbach 2018; Rathmann & Mathur 2002; Rathmann & Mathur 2008) or, on the other hand, which argue for differential object marking in sign languages¹⁴ (Börstell 2019; Bross 2020b). This list of theories is far from being exhaustive and more elaborated overviews of different agreement accounts can be found in Sandler & Lillo-Martin (2006), Lillo-Martin & Meier (2011), Mathur & Rathmann (2012) and Costello (2015).

4.4.1 Gestural approach

The gestural analysis was initially proposed by Liddell (1995; 2000; 2003; 2011), adopted by Johnston & Schembri (2007) and further developed in Schembri, Cormier & Fenlon (2018). Liddell argues that noun phrases are not associated with abstract R-indices, but loci in space are rather gestural in nature. He refers to agreement verbs as indicating verbs since in his view, indicating verbs incorporate a deictic pointing gesture and thus, indicate the arguments instead of agreeing with them. His analysis is based on the theory of mental spaces (Fauconnier 1985; Fauconnier 1997) and assumes a connection between linguistic elements and mental spaces. Verbs are directed towards the locations of present or absent referents using different mental spaces. If a discourse referent is present, signers will use the *real space*, which corresponds to the signer's perception of his current physical environment. The signer points or directs the verb towards the actual physical location of the referent. If a discourse referent is absent, *surrogate space* will be used. The signer conceptualizes entities the same way

¹⁴ Differential object marking is not a genuine theory of agreement. In section 3.2.1, I showed that it is generally concerned with the identification of arguments, especially the identification and marking of the object argument. It covers the phenomenon that some objects receive a special marking compared to other arguments in the clause by devices such as verbal morphology, case marking or additional object markers. As such, it combines aspects from word order, argument and agreement marking. However, I decided to mention DOM within the agreement theories of sign languages since it has been argued that PAM in DGS is a direct manifestation of DOM instead of an agreement auxiliary as assumed in previous analyses.

as if they were present and points or directs the verb towards an imagined location of the referent. Since verbs can be directed to an unlimited number of locations in real and surrogate space, Liddell sees this listability problem as the core argument against an agreement analysis. Furthermore, sign languages show some non-canonical forms of agreement as described in section 3.2.2 such as the existence of different verb types including verbs that do not take part in the agreement process as well as the primacy of object over subject marking. Those aspects are regarded as arguments for a gestural approach to agreement. However, others have argued that the interaction with word order (e.g. agreement verbs show different word order patterns), the licensing of subject drop with agreement verbs, the existence and distribution of agreement markers and the grammaticalization of the use of space are strong claims for a morphosyntactic agreement analysis (see Wilbur (2013), Lillo-Martin & Meier (2011) and Quer (2011) for a detailed discussion of these counter arguments against a gestural analysis of agreement).

Schembri, Cormier & Fenlon (2018) propose an agreement theory which builds on Liddell's assumptions presented above and which is embedded in a Cognitive Grammar framework. Overall, Schembri, Cormier & Fenlon argue that agreement verbs¹⁵ consist of signs and pointing gestures and that their main function is reference tracking. Furthermore, signs and pointing gestures constitute a unimodal construction. With reference to Goldberg (1995; 2003), such constructions are seen as symbolic units which themselves represent a form-meaning pair, whereby "*form* in constructions may refer to any combination of syntactic, morphological, or prosodic features and *meaning/function* is understood in a broad sense that includes reference to lexical semantics, event structure, diathesis, pragmatics and discourse structure" (Fried 2015: 975). According to Schembri, Cormier & Fenlon, agreement verbs represent constructions which involve i) a sign which is specified for a particular handshape, orientation and movement pattern and which has specific phonological, morphosyntactic, semantic and discourse properties and ii) a deictic gesture with own pragmatic properties that is incorporated into the form (Schembri, Cormier & Fenlon 2018: 12). Such an agreement verb construction is presented below in figure 17 (Schembri, Cormier & Fenlon 2018: 13).

¹⁵ Liddell, Schembri, Cormier & Fenlon (2018) refer to them as 'indicating verbs'.

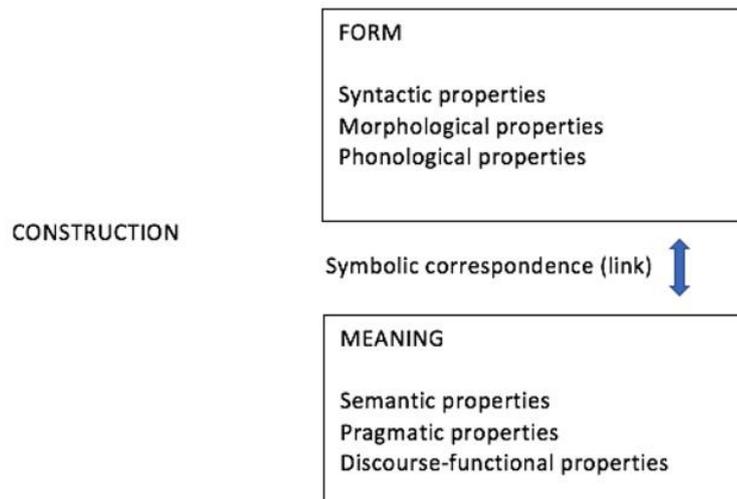


Figure 17: Agreement verbs as constructions (Schembri, Cormier & Fenlon 2018)

Schembri, Cormier & Fenlon illustrate their arguments referring to the BSL verb *PAY*. The stem is lexically specified for a particular handshape, orientation and movement. However, the starting and endpoint of the verb movement involves a deictic gesture and is considered as variable. In line with Liddell, they argue that the directionality of agreement verb construction is determined by the presence of real or imagined referents and not by formal properties of a controller noun phrase as it would be the case in a canonical agreement account (as described in section 4.3.1). Hence, Schembri, Cormier & Fenlon reject a purely syntactic agreement analysis.

4.4.2 Thematic approach

An influential analysis of verb agreement in sign languages, which combines grammatical and thematic roles of the arguments as the determinants of an agreement realization, was proposed by Meir (1998a; 2002). A similar suggestion is also offered by Bos (2017) who further included agreement markers in her analysis. However, in this section, I will concentrate on the thematic approach presented by Meir and will outline the main arguments of her approach. In general, she proposes a unified analysis for forward and backward agreement verbs. She argues, on the one hand, that the direction of path movement of agreement verbs is determined by the thematic role of the arguments, while, on the other hand, the facing of the hand(s) is determined by the syntactic role of the arguments. She assumes the following principles of agreement (Meir 2002: 425):

- the direction of path movement is from the source argument to the goal argument
- the facing of the hand(s) is towards the object of the verb

She further argues that agreement verbs consist of three components: (i) the verb root, (ii) a directional morpheme DIR and (iii) a suffix, which denotes dative case. With reference to the verb root of agreement verbs, the root denotes concrete transfer such as in the verb GIVE or abstract transfer such as in the verb TEACH. She assumes a lexical structure for such events of transfer as shown in (87) (α = subject, β = object) (Meir 2002: 432; Pfau, Salzmann & Steinbach 2018: 12).

$$(87) \begin{array}{l} \text{spatial tier} \\ \text{action tier} \end{array} \left[\begin{array}{l} \text{CAUSE } ([\alpha], [\text{GO } ([]^v, [\text{Path FROM } [\alpha/\beta] \text{ TO } [\beta/\alpha]])]) \\ \text{AFF } ([]^\alpha, []^\beta) \end{array} \right]$$

The spatial tier represents the motion component, while the action tier stands for the affectedness component of an agreement verb. The direction of motion of the theme argument is not specified on the verb root but by path movement, which she analyzes as a directional morpheme DIR. Regarding DIR, it realizes agreement with the source and the goal argument and is considered a bound morpheme, which fuses with the root of the verb. The third component of agreement verbs refers to the facing of the hands (i.e. the orientation of palm and fingertips) that realize a suffix, which assigns dative case to the goal argument.

Agreement, spatial and plain verbs are differentiated based on whether they involve transfer, the DIR or the case-assigning morpheme. Agreement verbs involve all three components and denote transfer, have a DIR as well as a case-assigning morpheme. Forward and backward agreement verbs are differentiated by assuming different DIR morphemes for both verb types. The path movement of forward and backward agreement verbs is from the source to the goal argument for both verb types. However, the source and goal argument are aligned differently as illustrated in (88) (Meir 2002: 434; 437–438; Pfau, Salzmann & Steinbach 2018: 12). (88)a) corresponds to forward agreement verbs since path movement is from subject to object, while (88)b) shows path movement from object to subject for backward agreement verbs.

$$(88) \begin{array}{l} \text{a. } [\text{GO } ([]^v, [\text{Path FROM } []^\alpha \text{ TO } []^\beta]) \\ \text{b. } [\text{GO } ([]^v, [\text{Path FROM } []^\beta \text{ TO } []^\alpha]) \end{array}$$

With regard to spatial verbs, they involve transfer and have a DIR morpheme but not a suffix that assigns dative case. Plain verbs, in contrast to the other verb types, do not involve a concept of transfer, they do not have a DIR or case-assigning morpheme and they cannot

realize agreement due to phonological restrictions. If their place of articulation is phonologically specified for the body, the verb root cannot fuse with a DIR morpheme.

De Quadros & Quer (2008) offer three main arguments against a thematic analysis as proposed by Meir (further problematic issues with her account are discussed in Pfau, Salzmann & Steinbach 2018): i) path movement of agreement verbs is not always linked to transfer, ii) the second argument of the verb does not always have the thematic role goal but can also be a theme argument and iii) the movement of agreement auxiliaries like PAM in DGS is syntactically determined since PAM moves from subject to object locus and not from the source argument to the goal argument.

4.4.3 Generative approaches

This section presents different agreement accounts subsumed under a generative approach to agreement. On the one hand, they analyze agreement as driven by syntactic principles such as checking of morphosyntactic features (Neidle et al. 2000; Oomen 2020; Oomen & Kimmelman 2019; Pfau, Salzmann & Steinbach 2018; Rathmann & Mathur 2002; Rathmann & Mathur 2008) or on the other hand, they argue for agreement markers as differential object markers (Börstell 2019; Bross 2020b).

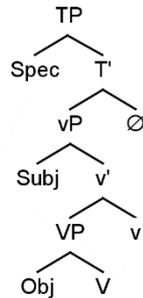
Neidle et al. (2000) see agreement as a feature-checking process. They argue that loci in the signing space are direct manifestations of phi-features, especially person features, and accept that there is in principle an unlimited number of the latter. For DGS, Rathmann & Mathur (2002) argue that animacy of the verb's arguments determines which verbs participate in agreement. They predict that only verbs with two animate arguments or with an animate and an inanimate concrete object can mark agreement. In a context involving two animate arguments as in *I teach the student* the verb shows agreement modification, whereas in contexts such as *I teach mathematics* the abstract object prevents the verb from showing agreement modification. The feature analysis of agreement is proposed in Rathmann & Mathur (2008). Here, they argue that verbs agree with subject and object in the morphosyntactic features of person and number. They assume the following features (Rathmann & Mathur 2008: 200):

- two person features: a first and a non-first-person feature
- two number features: a singular and plural feature

The first-person feature is realized as a location on or near the chest, whereas the non-first-person feature is realized as a zero form. A collective plural reading is realized as an arc movement, while the singular form is realized as a zero form.

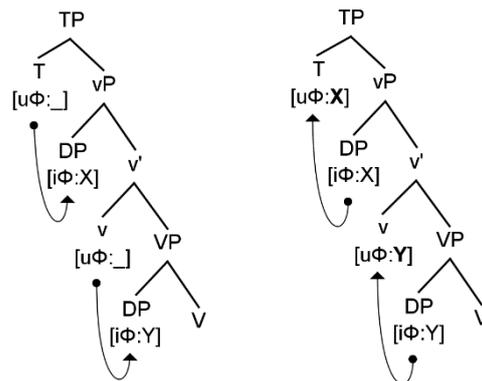
Pfau, Salzmann & Steinbach (2018) provide a theory of agreement as a feature-checking process within the Minimalist Program and offer a formal syntactic analysis of agreement for DGS. In general, they assume the following phrase structure of DGS based on subsequent work by Pfau (2002; 2016) und Pfau & Quer (2002):

(89)



As presented in section 4.3.2, agreement within the Minimalist Program is realized as a process of feature copying and checking. Probes carry unvalued phi-features (semantic features of person, number and gender), whereas goals are equipped with the equivalent interpretable features. The *v* and *T* heads are carrying unvalued phi-features and the syntactic operation Agree is searching for the equivalent valued feature within the c-command domain of *v* and *T*. Hence, the valued features of the subject DP in SpecvP are copied onto *T* and the features of the object DP in SpecVP are copied onto *v* (90).

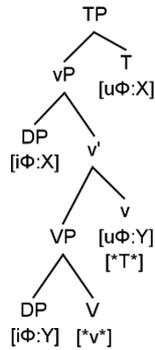
(90)



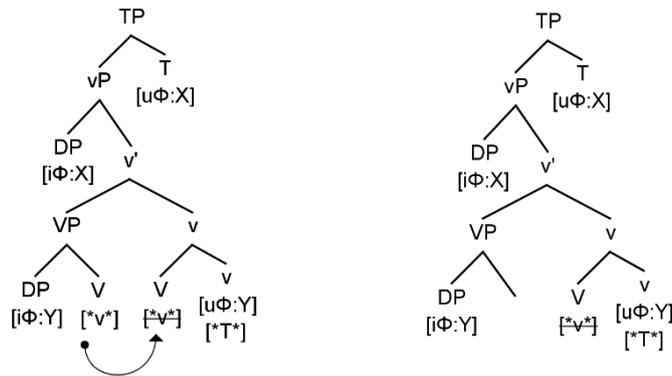
Pfau, Salzmann & Steinbach assume different movement operations depending on the type of the verb for DGS. For forward agreement verbs, they propose that *V* is carrying an unvalued [**v**] feature as shown in (91), which forces the lexical verb to move to *v* in order to check it. Thus, *V* is adjoined to *v* resulting in a *v*+*V* complex (92). They furthermore assume that *v* is carrying a [**T**] feature and checking this feature requires the *v*+*V* complex to move to *T* as in (93), which then forms another complex *v*+*V*+*T* head. They assume that

the lexical verb is spelled-out, but v is realized as zero. In addition, they adopt a post-syntactic account to morphology such that complex heads are linearized at PF as in (94).

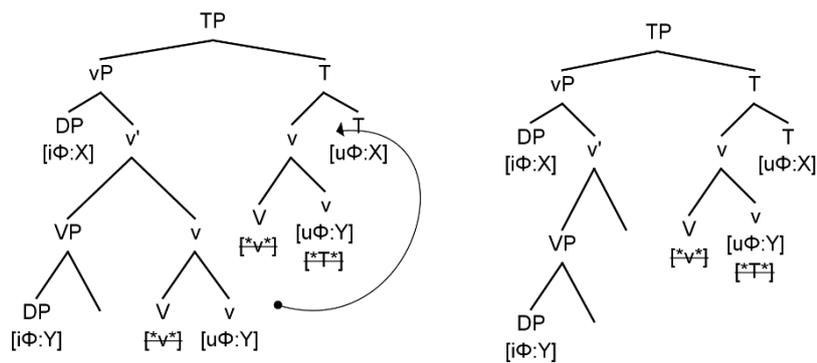
(91) Forward agreement verbs: [$*v^*$] feature



(92) Forward agreement verbs: V to v movement



(93) Forward agreement verbs: v to T movement

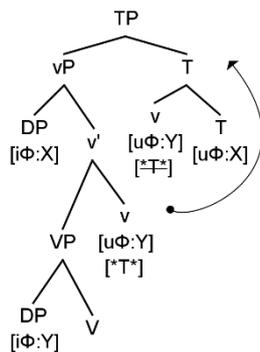


(94) Forward agreement verbs: Linearization at PF



Concerning plain verbs, agreement is expressed by an insertion of the agreement auxiliary PAM. To capture this, they assume that V does not carry a [$*v^*$] feature, consequently the lexical verb does not move to v but rather stays in its position. Nevertheless, v moves to T for checking the [$*T^*$] feature resulting in a v+T complex as illustrated in (95). However, v is now realized as PAM and not as zero as in the case of forward agreement verbs.

(95) Plain verbs



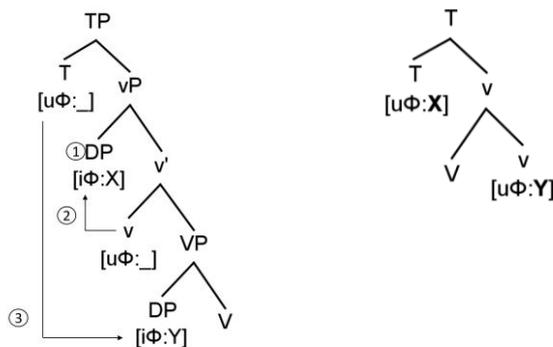
Pfau, Salzmann & Steinbach assume that Agree and Merge operating on v are ordered differently and imply different alignments. For regular agreement verbs, the following steps take place: First, Agree between v and the object; second, the subject is merged to v and third, Agree between T and the subject. In contrast to forward agreement verbs, backward agreement verbs realize agreement by the reversed path movement from object locus to subject locus. In their account, they propose to order syntactic operations for backward agreement verbs as follows: First, the subject is merged to v; second, the subject agrees with v (under m-command) and third, T agrees with the object.

- Regular agreement verbs
 - Agree (between v and object)
 - Merge (subject to v)
 - Agree (between T and subject)

- Backward agreement verbs
 - Merge (subject to v)
 - Agree (between subject and v; m-command relation)
 - Agree (between T and object)

These assumptions imply that T-V-v is expressed as path movement from subject to object locus in the case of forward agreement verbs and as a reversed path movement from object to subject locus in the case of backward agreement verbs as shown in (96) below.

(96)



Hence, the account of Pfau, Salzmann & Steinbach offers a purely syntactic explanation of agreement in DGS and assumes that all kind of verbs take part in the agreement process. Plain verbs are considered as expressing agreement by the insertion of PAM which implies that PAM obligatorily accompanies plain verbs. Furthermore, their account is based on a clause-final position of PAM. However, I will show in section 5.6.6 that these assumptions are in contrast to the presented findings. In my data, PAM was mainly found with (modified) agreement verbs and placed in a clause-internal position preceding the object. I will discuss these issues in detail in section 6.4.2 and will come back to Pfau, Salzmann & Steinbach's account in section 7.2.

Oomen & Kimmelman (2019) and Oomen (2020) offer a unified agreement analysis for body-anchored (plain verbs signed near or on the body), neutral (plain verbs signed in the neutral signing space) and agreement verbs.¹⁶ Their analysis is based on a previous

¹⁶ Spatial verbs are treated as a separate verb class in Oomen (2020) since they behave more flexible regarding the alignment with locations in the signing space and have less restricted constraints on subject drop compared to agreement verbs. Oomen proposes to analyze the path movement of spatial verbs as involving a demonstration component (Davidson 2015). Path movement starts and ends at locations in space which are pragmatically chosen respecting the Maxim of Quantity (Grice 1975). The location of referents in space is only that informative as needed for the interpretation in discourse.

investigation by Oomen (2017) on psych verbs in NGT. Oomen (2017) showed that psych verbs are usually articulated on or near the signer's body and that they frequently allow for subject drop. She found that out of 133 clauses with a psych verb, the subject was omitted in 72 clauses. However, subject drop showed a person restriction and was further dependent on the involvement on role-shift. In 27 clauses without role-shift, a first-person subject was omitted. Only one clause was found that showed an omission of a third-person subject. In clauses with role-shift, a different pattern occurred. 17 clauses involved omission of a first-person subject and 27 involved the omission of a third-person subject. Based on that findings, Oomen & Kimmelman (2019) hypothesize that subject drop with body-anchored plain verbs is restricted to first-person subject arguments and the drop of a non-first-person subject argument is excluded. In contrast, plain verbs signed in neutral signing space allow the drop of all kind of subjects (first, second and third-person subjects). Furthermore, Oomen & Kimmelman assume that these restrictions do not apply in clause involving role-shift. Here, all kinds of subjects can be omitted with body-anchored and neutral plain verbs. They suppose that null subjects of body-anchored verbs are always interpreted as first-person due to an iconicity effect. With regard to body-anchored verbs, the body refers to the signer by default and is therefore always interpreted as first-person. Their hypotheses are supported by corpus findings of DGS and RSL. For DGS, they observe that in clauses without role-shift, first-person subjects of body-anchored verbs are frequently dropped (103 tokens). However, third-person subjects with body-anchored verbs are omitted much less frequently (10 tokens). In contrast, 20 tokens with an omitted third-person subject and 30 tokens with an omitted first-person subject were found in clauses with neutral verbs. On the other hand, clauses involving role shift allow the drop of third-person subjects with body-anchored verbs (25 tokens). For RSL, Oomen & Kimmelman report similar findings. In clauses without role-shift, the omission of a third-person subject of body-anchored verbs is disfavored.

The theory presented in Oomen & Kimmelman (2019) and Oomen (2020) assumes an agreement relation between body-anchored verbs and their subjects. They suggest a different grammatical category named as *referent* instead of the category *person*. It is supposed that subjects and verbs are carrying semantic and formal features. Semantic features provide semantic information for the interpretation, while formal features are grammatical features which are lexically specified. Semantic features can be interpretable or uninterpretable, whereas formal features are either inherent or non-inherent. Table 6 (Oomen 2020: 229) exemplifies the assumed features for subjects and body-anchored verbs in sign languages.

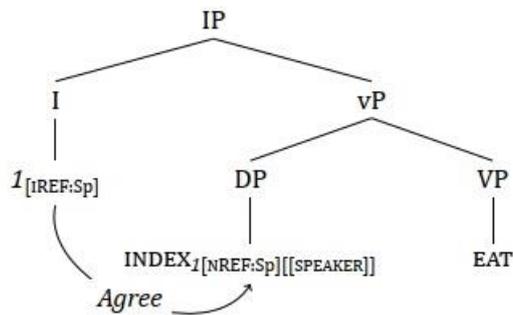
Table 6: Semantic and formal features of subjects (first, non-first, null) and body-anchored verbs (Oomen 2020: 229)

	First	Non-first	Null	Verb
Formal	[_N REF:Sp]	[_N REF:R], [_N REF:L]...	[_N REF]	[_I REF:Sp]
Semantic	[[SPEAKER]]	[[R]], [[L]]...	-	- <i>or</i> [[SPEAKER]]

Regarding formal features, Oomen assumes that nominal and pronominal subjects have non-inherent referent feature values. Nominal arguments and non-first-person pronouns carry a non-inherent R/L-feature, which can be either [_NREF:R] or [_NREF:L]. This idea is inspired by the proposal of Steinbach & Onea (2016) who assume that new discourse referents are assigned to contrary regions in the signing space by default; one referent will be associated with the right side of the signing space and the other referent will be associated with the left side of the signing space. First-person pronouns also carry a non-inherent R/L-feature and its value is specified as [_NREF:Sp] (Sp = Speaker). Null arguments do not have a formal feature, while the inherent referent-feature specification of body-anchored verbs is [_IREF:Sp]. With reference to the semantic features, body-anchored verbs bear an interpretable referent-feature [[SPEAKER]] based on the fact that those verbs are articulated on the body and do not change their phonological form. However, this feature is only relevant in cases when body-anchored verbs appear with a non-overt subject. Non-first-person subjects have an interpretable semantic [R] or [L]-feature and first-person subjects bear an interpretable [[SPEAKER]] feature value.

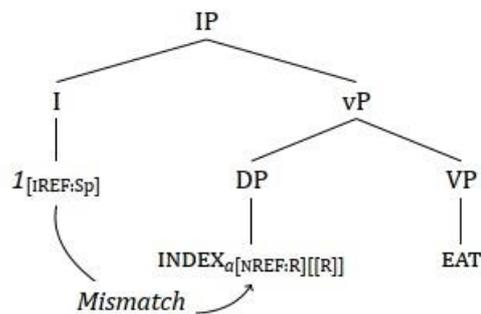
A schematic representation of an overt first-person subject and an intransitive body-anchored verb is given in (97) (Oomen 2020: 297). The body-anchored verb is associated with an inherent speaker feature [_IREF:Sp] which sits in the head of I. The specifier of vP hosts the pronominal subject INDEX_I, which is equipped with a formal non-inherent speaker feature [_NREF:Sp] and the semantically interpretable [[SPEAKER]] feature. In this situation, there is no mismatch between the features sitting in SpecvP and in I; thus, the subject is interpreted as first-person ('I ate').

(97)



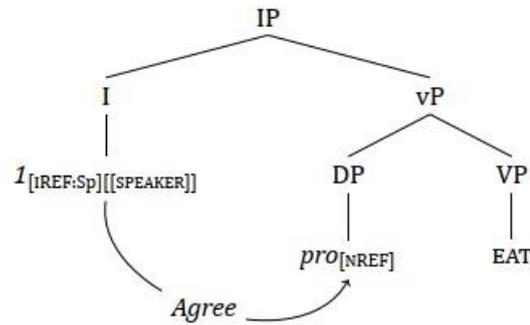
The use of an intransitive body-anchored verb with an overt third-person subject as in *he/she/it ate* leads to feature mismatch as represented in (98) (Oomen 2020: 298). The subject bears a non-inherent R/L-feature and the body-anchored verb is associated with a speaker-feature sitting in I, subsequently there is mismatch of features. It is assumed that the interpretable feature of the subject overrides the mismatch of formal inherent features to yield the right interpretation.

(98)



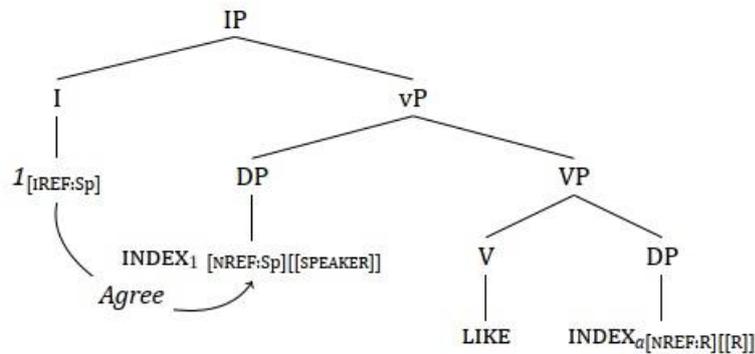
If a body-anchored verb occurs with a null subject, the structure in (99) (Oomen 2020: 299) is expected ('[I] ate'). *Pro* has an unvalued non-inherent feature; consequently, the verb needs to be associated with the interpretable feature $[[SPEAKER]]$. Via feature checking, the non-inherent feature on *pro* becomes interpretable as first-person.

(99)



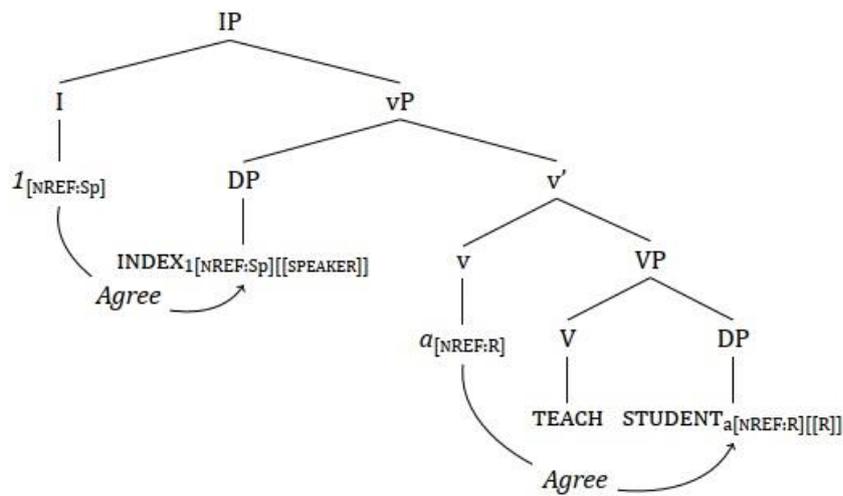
The syntactic structure of transitive body-anchored verbs and first-person subjects as in *I like him* is illustrated in (100) (Oomen 2020: 300). The subject $INDEX_1$ and the object $INDEX_a$ bear non-inherent referent features, which are situated in SpecvP and in the complement of V. The body-anchored verb is associated with a speaker-feature, which sits in I° . There is agreement between the features of the subject and the speaker-feature in I° .

(100)



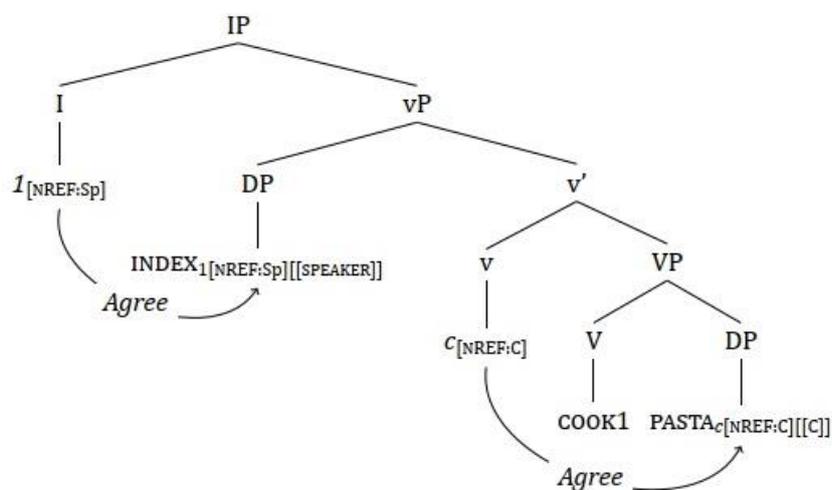
Oomen (2020) expands the theory to the analysis of agreement verbs as shown in (101) ('I am teaching a student') (Oomen 2020: 305). Both arguments of TEACH (the subject $INDEX_1$ located in SpecvP and the object STUDENT located inside the VP) bear formal non-inherent referent features as well as semantic interpretable features. Those match with the non-inherent referent features which reside in the I-head and the v-head.

(101)



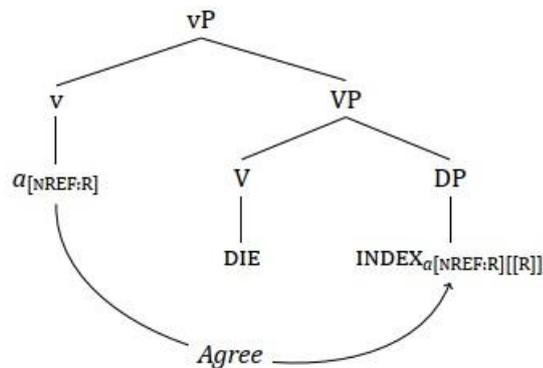
Transitive neutral verbs are presented in (102) (I'm cooking pasta') (Oomen 2020: 309). Oomen predicts that neutral verbs can localize their arguments; either the internal argument in transitive constructions or the sole available argument in intransitive constructions and as such express agreement. The structure is the same as with agreement verbs above; thus, the features of subject and object agree with the features in I° and v. There is one exception compared to agreement verbs; namely, the internal argument has a 'C' feature for center since inanimate arguments are usually localized in the center of the signing space. Since neutral verbs as opposed to agreement verbs do not show double agreement with both arguments but only with the internal argument, the agreement features of the internal argument are spelled-out first.

(102)



The syntactic structure of intransitive neutral verbs such as DIE is depicted in (103) ('he died') (Oomen 2020: 311). There is agreement between the features of the internal argument and the referent-feature that sits in v.

(103)



Pfau, Salzmann & Steinbach (2018), Oomen (2020) and Oomen & Kimmelman (2019) assume that all types of verbs take part in the agreement process. Instead of relying on PAM as Pfau, Salzmann & Steinbach, Oomen & Kimmelman argue that body-anchored plain verbs are in an agreement relationship with the subject by referring to the signer's body by default. Oomen (2020) expands this idea and argues that agreement verbs agree with the subject and direct object in transitive constructions and with the subject and indirect object in ditransitive constructions; neutral verbs agree with the internal object in transitive constructions and with the only present argument in intransitive constructions. However, the theory makes no claims about possible word order variations that might go hand in hand with their proposed account. In Oomen (2020), she makes some suggestions how the correct surface word orders found in DGS might be derived from the presented theory. I will further discuss this issue in section 7.4.

Börstell (2019) shows that sign languages use word order, agreement marking and agreement markers as devices to distinguish arguments and their roles. He argues that these strategies have properties, which resemble those identified for differential object marking in spoken languages (see also section 3.2.1). In particular, he claims that animacy generally structures argument marking in sign languages and that some sign languages have developed dedicated object markers which he regards as direct manifestations of DOM. In section 3.1.2.2, I already showed that animacy has an effect on word order and argument marking in sign languages. In reversible clauses with two animate arguments, signers prefer a SVO order to avoid ambiguity, whereas in non-reversible constructions, animate arguments frequently precede inanimate arguments. This effect was also observed in gesture studies (Gibson et al.

2013; Hall, Mayberry & Ferreira 2013; Meir et al. 2017) discussed in section 4.2.1.3. Meir et al. (2017) conclude that such preferences are due to a ‘human first’ principle such that human entities generally precede other arguments irrespective of semantic or syntactic roles. In addition to word order, agreement marking is influenced by animacy since it is restricted to animate objects (Rathmann & Mathur 2002). According to Börstell (2017; 2019), agreement markers bear resemblance to differential object markers since they are usually restricted to [+human] arguments (Sapountzaki 2012). Furthermore, some markers such as PAM in DGS have been grammaticalized from the sign PERSON (Pfau & Steinbach 2006a; Pfau & Steinbach 2013; Steinbach & Pfau 2007) which reflects the strong interaction with animacy. For DGS, Bross (2020b) assumes that a clause-internal positioned PAM is used as a differential object marker. He disagrees with the traditional view that PAM functions as an auxiliary (Pfau, Salzmänn & Steinbach 2018; Steinbach 2011; Steinbach & Pfau 2007) and argues that PAM is a prepositional like element. Animacy, definiteness and affectedness of the direct object trigger the use of PAM. Bross argues that PAM obligatorily agrees with the object as in (105)a (Bross 2020b: 21) and not as previously analyzed with subject and object illustrated in the previous shown example (69) (Steinbach & Pfau 2007: 322) (repeated here as (104)). Moreover, Bross claims that PAM leads to a definite/referential reading as shown in (105)b) and (105)c) (Bross 2020b: 20). Furthermore, he argues that transitive verbs with a mentally/emotionally affected animate object such as KNOW, LOVE, or INSULT are always used with PAM (see section 7.3 for a detailed discussion of his account).

(104) MOTHER IX_{3a} NEIGHBOR NEW IX_{3b} LIKE _{3a}PAM_{3b} [DGS]
 ‘(My) mother likes the new neighbor.’

(105) [DGS]

a. PAUL_{3a} PAM_{3b} MARIA_{3b} ANGRY_{3b}
 ‘Paul is angry at Maria.’

b. YESTERDAY PAUL_{3a} POLICE#PERSON_{3b} SEE_{3b}
 ‘Yesterday Paul saw a/the policemen.’

c. Context: Do you remember the policeman that Paul talked about?
 YESTERDAY PAUL_{3a} PAM_{3b} POLICE#PERSON_{3b} SEE_{3b}
 ‘Yesterday Paul saw the policeman.’

Börstell also analyzes an object pronoun described for ISL as a direct manifestation of DOM. Such a pronominal sign has developed from the sign PERSON and is used with negative value verbs or psych verbs with [+human] objects in the singular. Similar object pronouns that have been grammaticalized from PERSON were identified in several Nordic sign languages such as DSL, Finland-Swedish Sign Language, FinSL, Norwegian Sign Language (NSL) and SSL (Börstell 2017). All those pronouns can replace [+human] discourse referents. Börstell (2017) shows for SSL that the sign PERSON has different properties when used as an object pronoun. In the latter case, it has a reduced articulation and the mouthing corresponds to the Swedish object pronoun. Furthermore, it is restricted to (i) object function, (ii) [+human] arguments and to (iii) first- and second-person plural forms which are strong arguments for a differential object marker in his view.

4.5 Summary

Chapter 4 presented how word order and agreement are handled within different theoretical approaches based on spoken languages as well as sign languages. Starting with word order theories in spoken languages in 4.1, I outlined the functional-typological, the generative and the optimality approach. The typological approach to word order presented in section 4.1.1 aims to describe word order patterns and pursues a classification of languages based on a large sample of languages. One further major goal is to find correlations between the orders of elements in a clause compared to other elements of it. Since the beginning of research on word order, different explanations have been brought forward to account for word order variations across languages including the distinction between operators and operands (Vennemann 1974), functional principles such as the ‘Animated First Principle’ (Tomlin 1986), branching-direction theory (Dryer 1992) or general preferences in terms of processing capacity (Hawkins 1994; Hawkins 2004). In generative approaches (section 4.1.2), the main focus lies on the hierarchical structure of sentences. Word order variations across languages have been either explained by assuming universal principles and different parameter settings (Chomsky 1981) or in more recent developments by suggesting an underlying SVO order for all languages (Kayne 1994). The latter sees order as directly reflected in phrase structures built on the basis of asymmetric c-command and word order variations have to be explained by movement operations. Building on these assumptions, cartographic approaches to syntax expanded hierarchical phrase structure and proposed further functional projections and movement operations to account for word order differences. However, within the Minimalist Program, these differences are reduced to two syntactic operations, namely Merge and Move.

Combining aspects from typological and generative orientated views, word order variation within Optimality Theory (section 4.1.3) is modeled as competing and ranked constraints according to language specific properties.

Section 4.2 discussed word order theories in sign languages. In section 4.2.1, I presented a series of gesture studies, which showed that SOV is the predominant order used within visual communication and demonstrated that gesture order is independent from the dominant word order of spoken language grammar. The presented studies differ in their core explanations and argumentations – SOV order as default order of the visual modality (Gershkoff-Stowe & Goldin-Meadow 2002; Goldin-Meadow et al. 2008); SOV as the default order of prelinguistic communication (Langus & Nespors 2010); or argue for competing factors that explain the SOV/SVO variation found among the world's languages. Among these relevant factors they consider the reversible character of the situation (Gibson et al. 2013; Hall, Mayberry & Ferreira 2013; Meir et al. 2017), event type and verb semantics (Napoli, Sutton-Spence & de Quadros 2017; Schouwstra & de Swart 2014) or environmental and social-interactive aspects (Christensen, Fusaroli & Tylén 2016; Schouwstra, Smith & Kirby 2016) as decisive for word order. A functional and cognitive approach to word order is discussed in section 4.2.2. According to Johnston (2019), word order in Auslan is determined solely by semantic, pragmatic and modality specific factors and influenced by language contact with English. In contrast to such a view, formal syntactic theories (4.2.3) assume a hierarchically organized clause structure in ASL and other sign languages and argue that sign languages imply the same mechanisms as proposed for spoken languages though they may also show modality specific deviations. Whereas Neidle et al. (2000) base their argumentation on the use and distribution of non-manuals, others have focused on the position of adverbs, modals, negatives or auxiliaries with respect to subject, object and verb to account for basic clause structure (Petronio 1993; Petronio & Lillo-Martin 1997; de Quadros 2003; de Quadros & Lillo-Martin 2010; de Quadros 1999).

Section 4.3 compared two different approaches to agreement in spoken languages, which both highly influenced the discussion of agreement in sign languages. Whereas typological orientated approaches aim at describing all possible forms and characteristics of agreement patterns based on various languages, agreement within the Minimalist Program is formulated as a syntactic operation (Agree) and elements are merged and moved within the syntactic domain of c-command in order to check matching phi-features.

Section 4.4 presented agreement accounts in sign languages: i) the gestural approach, ii) the thematic approach and iii) the generative approach. The gestural analysis (4.4.1) was initiated

by Liddell (1995; 2000; 2003; 2011) who rejects an agreement analysis and argues for a gestural component based on mental-space theory. Building on these assumptions, Schembri, Cormier & Fenlon (2018) offer an analysis of agreement and argue within a Construction Grammar framework that agreement verbs are constructions combining signs and deictic pointing gestures. The thematic analysis by Meir (1998a; 1998b; 2002) (4.4.2) combines semantic and syntactic principles and sees transfer as the underlying concept of agreement. Meir argues that the verb's movement is semantically determined by the thematic roles of source and goal, while the facing of the hands towards the object is syntactically defined. Within the generative approaches (4.4.3), I presented accounts which propose an agreement analysis based on features of the verbs (Neidle et al. 2000; Rathmann & Mathur 2002; Rathmann & Mathur 2008; Pfau, Salzmann & Steinbach 2018; Oomen & Kimmelman 2019; Oomen 2020) or see agreement markers in sign languages as differential object markers (Börstell 2019; Bross 2020b). Pfau, Salzmann & Steinbach (2018) offer a unified agreement analysis for plain and agreement verbs within a minimalist approach to syntax. Agreement is the result of verb movement triggered by different features on plain and agreement verbs and additional PAM insertion in the case of plain verbs. Oomen & Kimmelman (2019) and Oomen (2020) also argue for a unified agreement analysis. They assume that body-anchored plain verbs are in an agreement relationship with the subject by assuming that body-anchored verbs carry an inherent speaker-referent feature. Neutral and agreement verbs, however, bear non-inherent referent features and agreement is expressed by movement of the verbs in order to establish matching features. Whereas Pfau, Salzmann & Steinbach (2018) treat PAM in DGS as an agreement marker, Börstell (2019) and Bross (2020b) argue that PAM is a differential object marker and its use is triggered by the animacy, definiteness and affectedness of the object.

5 Empirical study: verb type and word order in DGS

This chapter presents the empirical investigation of verb type influences on word order in DGS. In section 5.1, I will start with a discussion about methodological aspects of studying word order in general and in sign languages in particular and will give an overview of studies conducted on word order in sign languages. In section 5.2, I will give details on the participants who took part in the current elicitation task and in section 5.3, I will describe the research design and stimulus material that was used to elicit the data. In section 5.4, I will explain the elicitation procedure, whereas in section 5.5, I will present the transcription and evaluation of the data. The results will be shown in section 5.6.

5.1 Empirical methods and research overview

First of all, the knowledge of a basic word order of a language is often a prerequisite for all further investigations of that language. Hence, research on word order has been a prominent research topic in spoken as well as in sign language linguistics and has been done within different research traditions and based on different empirical methods. In the following, I will discuss some of the critical methodological issues that have been drawn in the literature. Furthermore, I will give an overview of word order studies carried out for sign languages and will comment on the used empirical methods.

In the chapters 3 and 4, I showed that typological word order research aims at describing and characterizing word order patterns across the world's languages. It is a further goal to formulate word order principles in forms of statistical universals which apply to all languages of the same type (Hawkins 1983). This type of approach is based on the assumption that grammatical categories such as subject, verb and object and parts-of-speech categories such as adjectives and nouns are comparable across languages. However, this kind of approach has also been strongly criticized (LaPolla 2002). LaPolla rejects such a generalized comparability and claims that more fine-grade distinctions between forms across and within languages have to be made. As an example, LaPolla mentions the studies on the position of negative morphemes compared to the verb done by Dryer (1988a; Dryer 1992). In the first publication from 1988, Dryer concluded that all negative elements correlate with the position of verb and object. In 1992, Dryer differentiated between negative particles, negative affixes and negative verbs and revised this assumption. He noticed that only negative verbs and affixes correlate with the order of verb and object, whereas negative particles do not. As a further argument, LaPolla remarks that word order universals are not explanations by themselves and other structural, semantic and pragmatic factors (which have been described

in section 3.1.1.2 for spoken languages and in section 3.1.2.2 for sign languages) as possible explanations for word order tendencies have to be taken into account. In addition, there is a need for empirical evidence of such observed word order universals as well as of factors affecting them.

Research on word order and syntactic variation based on spoken languages has long relied on an introspective analysis of data. Judgments were based on the acceptability or grammaticality of usually constructed examples. Moreover, such judgments were mostly made by researchers themselves and not by naïve speakers of the investigated language. Hence, these judgments have the risk to be biased by the linguistic and syntactic theory researchers have in mind. Since the critical outline of judgments as the base for linguistic research by Schütze (1996), there is a growing interest in more formal methods in doing linguistic as well as in experimental syntactic research. Such methods comprise experimental elicited judgments which are based on controlled and multiple items and on a large sample of naïve speakers (see for instance Wierzba & Fanselow (2020) and Verhoeven & Temme (2017) for recent acceptability studies on German word order variation and the references in Weskott (2021) for a general overview). In addition, research based on corpus data offers an analysis of natural language use compared to predefined and constructed examples in experimental setups and aims at covering a representative sample of language usage (for corpus studies on German word order see Verhoeven (2015), Bader & Häussler (2010), and Weber & Müller (2004) to cite a few). On the one hand, corpus data can show variation in register, dialect and style, on the other hand corpus studies offer the possibility to study language external factors as well. However, every corpus study faces the problem that it cannot provide grammatical claims about not attested structures. In other words, if a pattern is not found in the corpus, it will not imply that such a structure is necessarily ungrammatical. Moreover, acceptability judgments as well as corpus studies cannot directly observe cognitive processes that are linked to the production and/or processing of sentences. This can be overcome or complemented by psycholinguistic methods such as reading time or eye-tracking experiments or with methods focusing on brain productivity such as event-related potential (ERP) or functional magnetic resonance imaging (fMRI) techniques (sentence processing studies for German word order are for instance described in Bornkessel-Schlesewsky et al. (2009), Bahlmann et al. (2007), Weyerts et al. (2002)).

Word order research in sign languages uses the same empirical methods as described above but since sign languages are produced spatially and are visual perceived, the visual modality has consequences for the choice and use of research methods which I will describe in the following. First, as in any other research, different methods and analyses of data which are

further driven by different theoretical approaches make it difficult to compare results cross-linguistically. Regarding word order research in sign languages, this becomes particularly evident as different methods led to diverging assumptions about word order in ASL or Finnish Sign Language (FinSL). For instance, Fischer (1975) suggested SVO as the basic order of ASL sentences based on judgments of signed sequences, whereas Friedman (1976) claimed that ASL show a SOV order based on the investigation of natural discourse data. Jantunen (2008) first concluded that word order in FinSL seems to be free based on elicited data, but later rejected that claim and argued for SVO order based on corpus data (Jantunen 2017).

The first who used a standardized and reliable method to investigate basic word order in sign languages were Volterra et al. (1984). They elicited sentences with a picture description task that involved pairs of pictures contrasting in only one element such as a picture showing a boy that closes a door vs. a picture that shows a boy who opens the door. Two participants facing each other had to describe those. One of the signers got a set of pairs of pictures and in each pair; the picture that had to be described by the signer was marked. The second signer (the addressee) got the same set of pictures but without any markings and had to identify and select the picture based on the description of the other signer. This method was widely adopted and used for describing word order in many different sign languages for example in Coerts (1994) for NGT, Sze (2003) for HKSL and Kimmelman (2012) for RSL among others. Although this method was replicated for a number of sign languages, Johnston et al. (2007) point out that different factors such as terminology, theoretical assumptions and missing definitions complicate cross-linguistic comparison of these studies. First, researchers use different terminologies in defining arguments. Whereas some refer to subject and object and define arguments rather morphosyntactically, others use semantic notions such as agent and patient which complicates the direct comparison of results. Additionally, the definition of arguments is rather broad. Arguments named as S are usually agents and arguments defined as O are usually any other argument in the clause. Furthermore, clear definitions of clauses or sentences are frequently missing and the criteria of defining clause or sentence boundaries are not always made clear. Furthermore, most of the studies present their results as number or frequencies of occurrences and provide few examples, subsequently decisions regarding clause-hood are not always comprehensible. In addition to that, the transcription system is usually not consistent across studies. In general, studies are carried out and analyzed with different theoretical approaches in mind and conducted within a specific scientific tradition. Regarding word order research in particular, assumptions and results of these studies are driven by more syntactically orientated or semantically-pragmatically orientated

approaches. Due to the sociolinguistic characteristics of the Deaf community (which have been discussed in section 2.1), sign language studies in general face the problem that only a small and heterogeneous number of Deaf signers or participants is consulted which lead to varying and heterogeneous results.

The following table 7 gives an overview of word order research in sign languages and the different used methodologies. This list is not exhaustive because only those studies are mentioned which were mainly carried out in order to study basic word order in particular.

Table 7: Research methods used to investigate word order in sign languages

Language	Method
ASL (Fischer 1975)	Grammatical judgments
ASL (Friedman 1976)	Natural discourse
ASL (Liddell 1980)	Translation of English sentences
ASL (McIntire 1982)	Elicitation based on story-retelling
BSL (Deuchar 1983)	Natural discourse
LIS (Volterra et al. 1984)	Elicitation based on drawings
Swiss-French Sign Language (LSF-SR) (Boyes-Braem et al. 1990)	Elicitation based on drawings
NGT (Coerts 1994)	Elicitation based on drawings
LSQ (Nadeau & Desouvrey 1994)	Natural discourse
LSQ (Bouchard & Dubuisson 1995)	Natural discourse
Libras (de Quadros 1999)	Introspection and grammatical judgments
BSL and Irish SL (Saeed, Sutton-Spence & Leeson 2000)	Elicitation based on drawings
ASL (Neidle et al. 2000)	Naturalistic and elicited data, grammatical judgments
Irish SL (Leeson 2001)	Elicitation based on drawings and natural discourse data
ASL, Austrian Sign Language (ÖGS) (Wilbur 2002)	Natural discourse
HKSL (Sze 2003)	Elicitation based on drawings
VGT (Vermeerbergen 2004)	Elicitation based on drawings
Argentine Sign Language (Massone & Curiel 2004)	Grammatical judgments, elicitation based on drawings and corpus data
HZJ (Milković, Bradarić-Jončić & Wilbur 2006)	Elicitation based on drawings

VGT and South African Sign Language (SASL) (Vermeerbergen et al. 2007)	Elicitation based on drawings
Auslan, VGT and Irish SL (Johnston et al. 2007)	Elicitation based on drawings
FinSL (Jantunen 2008)	Elicitation based on drawings and monologues
RSL (Kimmelman 2012)	Elicitation based on drawings and corpus data
Saudi Arabian Sign Language (Sprenger & Mathur 2012)	Story re-telling
PJM (Rutkowski & Łozińska 2016)	Corpus data
Libras (Napoli, Sutton-Spence & de Quadros 2017)	Elicitation based on drawings
FinSL (Jantunen 2017)	Corpus data
Auslan (Johnston 2019)	Corpus data
DGS (Oomen 2020)	Corpus data
GSL (Koraka 2021)	Elicitation based on drawings
Serbian Sign Language (Bajić et al. 2021)	Elicitation based on drawings

As table 7 shows, research on word order mainly involved three different tasks: grammatical judgments, picture description tasks and natural discourse/corpus data.

Judgments based on written or signed utterances are highly controlled and have the advantage that the researcher will get the signer's intuition about the exact structure the researcher is interested in. By using this method, the type of sentence (e.g. declarative sentences), the type of verb (e.g. plain or agreement) and the type of arguments (e.g. two animate or inanimate arguments) among other factors can be controlled for. However, the type of stimuli and the way of presenting them are crucial. If judgments are based on written sentences and involve translation from spoken to sign languages, there is a high risk of influence from the grammatical structure of the presented spoken language. The structure used by the signer is probably closer to the spoken language structure and mirrors the written form. To avoid such influences, glossed stimuli can be used but require that the participant

has some linguistic knowledge. Thus, signed utterances presented as videos are usually used for grammaticality judgment tasks. However, all judgments tasks face the problem that signers generally show a great variability in their judgments and do not regard examples as automatically ungrammatical. This might be due to the heterogeneity of the Deaf community and the bilingual contact situation described in section 2.1.

Since the study by Volterra et al. (1984), many researchers have used a picture description task to elicit basic word order in sign languages and have replicated their method. As described above, the original method of Volterra et al. involved a pair of pictures which differed in one contrastive action or object. But as pointed out by Kimmelman (2012), such a procedure could have had an influence on the participants' answers. Presenting participants pictures with contrastive elements is usually used to investigate aspects of information structure and specifically to elicit the information-structural notion of contrast. Indeed, Kimmelman (2019) successfully applied this method to investigate markings of contrast in RSL and NGT. To avoid such influences caused by information structure, Kimmelman (2012) used a slightly modified version of the original picture description task to study word order in RSL. A set of pictures instead of pairs of pictures were given to one signer in randomized order with mixed type of situations, which the signer then described to another signer. The advantage of elicitation methods using pictures or drawings is that the participants are not influenced by a given structure as it is the case by presenting written or signed stimuli. It is very likely that signers will produce transitive sentences with overtly expressed arguments, but it cannot be totally controlled for. This method is also suitable for testing influential factors on word order by manipulating the picture stimuli and control for instance for the animacy of the arguments. However, Kimmelman (2012) noticed that picture description tasks motivate the use of space. It has to be taken into account that it is more likely that signers will spatially arrange arguments in space and this probably might lead to the use of more constructions involving classifiers and simultaneity and to structures that reflect a ground-figure relation. Additionally, the researcher should be aware that the right or left position of the referents presented in the picture might lead to order preferences in the signer's answers.

Since more sign language corpora are developed, recent word order research investigates basic word order based on corpus data. On the one hand, it allows for more natural data and the communicative use of language, on the other hand, it shows more diverse data and reflects more variation regarding clause structure compared to elicit data. Studies on word order using corpus data e.g. Kimmelman (2012), Johnston (2019) and Johnston et al. (2007)

showed that transitive sentences with two manually expressed arguments are rather rare and instead intransitive sentences or even single signs are frequently observed structures.

DGS has generally been claimed to have a basic SOV order. Although there is quite some literature on clause structure in DGS, previous research has mainly been based on introspection or on empirical data elicited from only a few deaf signers (Bross 2020a; Happ & Vorköper 2006; Herrmann & Steinbach 2013; Keller 1998; Pfau & Glück 2000; Rathmann 2003). Only recently a corpus study on verbs in DGS looks at a broader sample of data and participants (Oomen 2020). For the study on word order in DGS, I decided to collect production data within an experimental setup. I used a modified version of a method called Sentence Reproduction Task (SRT) which will be described in detail in the following section 5.3. This method has some advantages compared to grammatical judgments, picture descriptions or corpus data described above. First of all, the results of the SRT are not based on the participants' judgments. Since signers showed a high degree of flexibility and variation concerning their answers and judgments in previous studies on DGS (see for instance Herrmann, Proske & Volk 2019), I decided against this method. Instead, like in other experimental studies, the SRT method allows for a controlled elicitation of word order patterns in DGS. To test verb type influences, the factors verb type, word order, number of arguments and length of sentences were controlled for. Furthermore, the influence of spoken or written German was reduced to a minimum because all stimuli were natural DGS videos. The SRT was designed and modified in a way to measure unconscious language use but as other controlled experimental studies, it still faces the problem that language is not investigated as it is used in a natural communication situation.

5.2 Participants

The data was collected from 22 native or near-native DGS signers. Some of them were recruited via contact information provided in the data base established by the Experimental Sign Lab at the University of Goettingen or via advertising the elicitation study by using social media formats such as Facebook. Most of the participants were also known from previous studies on DGS which were either carried out by me or colleagues. In order to take part in this study, participants had to fulfill the following criteria which were announced beforehand: (i) they must have reached the age of 18, (ii) the age of acquisition or the start of learning DGS must be before the age of six and (iii) DGS must be their primary and daily way of communicating.

Nine male and 13 female signers (age range: 19-48 years, mean: 31.7 years) from different regions in Germany participated in this data elicitation. 17 of them were native signers who had at least deaf parents and acquired DGS from birth. The remaining five participants were near-native signers who had hearing parents and started learning DGS at least by the age of four. All participants received at least a High School level¹⁷ (corresponding to *Mittlere Reife* in the German education system) as their highest level of education and most of them were also familiar with participating in experimental settings. Table 8 summarizes the metadata collected from the participants.

¹⁷ The following terminology concerning educational levels as well as the structure of presenting participants' metadata is adapted from Nuhbalaoglu (2019).

Table 8: Metadata

Participant	Sex	Age	Region	HS	AoA	HS (parents)	Education
1	Male	25	Saxony Hamburg	Deaf	Birth	Deaf	General qualification for university entrance
2	Male	25	Bavaria	Deaf	Birth	Deaf	High School
3	Female	28	Bremen	Deaf	Birth	Deaf	High School
4 ¹⁸	Female	40	North Rhine-Westphalia	Deaf	Birth	Deaf	University
5	Male	43	Hannover	Deaf	3	Hearing	Technical college
6	Female	48	Cologne	Deaf	3	Hearing	Technical college
7	Male	22	North Rhine-Westphalia	Deaf	Birth	Deaf	General qualification for university entrance
8	Female	23	Baden-Württemberg	Deaf	Birth	Deaf	General qualification for university entrance
9	Female	26	Bad Camberg	Deaf	Birth	Deaf	University
10	Male	36	Aachen	Deaf	Birth	Deaf/hearing	Technical college
11	Female	27	Bavaria	Deaf	Birth	Deaf	Technical college
12	Female	22	Kassel	Deaf	4	Hearing	General qualification for university entrance
13	Male	25	Ulm	Deaf	Birth	Deaf	Vocational baccalaureate diploma
14	Female	20	Bayreuth	Deaf	Birth	Deaf	General qualification for university entrance

¹⁸ This participant had to be excluded from the analysis because during the data elicitation it had become obvious that she had first been exposed to Russian Sign Language and had started learning DGS at the age of 11.

15	Female	47	Frankfurt	Deaf	Birth	Deaf/ hearing	Technical college
16	Male	48	Dortmund	Deaf	Birth	Hearing	Technical college
17	Female	41	Oldenburg	Deaf	Birth	Deaf	University
18	Female	24	Cologne	Deaf	Birth	Deaf	General qualification for university entrance
19	Male	19	Hamburg	Deaf	Birth	Deaf	General qualification for university entrance
20	Male	36	Schleswig	Deaf	Birth	Deaf	General qualification for university entrance
21	Female	37	North Rhine- Westphalia	Deaf	3	Hearing	General qualification for university entrance
22	Female	26	Munich	Deaf	Birth	Deaf	Technical college

5.3 Design and material

To elicit data on word order in DGS, I constructed a *Sentence Reproduction Task* (SRT) (Hauser et al. 2008). This method is frequently used in spoken language research as an assessment tool to test children's and adults' language capacity. Mayberry et al. (1983) were the first who used a reproduction task to test language fluency for sign languages. Several years later, the ASL-SRT (Hauser et al. 2008) was developed as an assessment tool to test language skills of older children and adult ASL signers. As an adaption of the Speaking Grammar Subtest of the Test of Adolescent and Adult Language (TOAL-3 Hammill 1994), the participants saw recorded sentences with increasing length and complexity and had to produce them as exact as possible from memory. Since then, similar tools have been developed for further sign languages: LIS-SRT (Rinaldi et al. 2018), NGT-SRT (Schüller 2018), LSF-SRT (Bogliotti, Fortuna & Morgenstern 2017), DGS-SRT (Rathmann & Kubus in prep.) and BSL-SRT (Cormier et al. 2012). Pendzich et al. (2022) and Pendzich, Herrmann & Steinbach (2019) on their study on conditional clauses and classifier constructions and Kubus et al. (2018) and Mpadanes et al. (2018) on their study on constructed action in hearing late learners were the first who used a SRT method for investigating other grammatical aspects of sign languages.

I used a modified version of a SRT and adapted the structure from Pendzich et al. (2022) and Pendzich, Herrmann & Steinbach (2019). In their SRT study as well as in the current study, participants saw a conversation of two signers and had to memorize and reproduce a critical sentence. In contrast to other previous SRT studies, the participants produced the sentence not immediately after the prompt was presented but after a short time period with intervening presented content. The overall design of the current SRT was the following: participants saw a controlled context signed by signer I. This was followed by a question of signer II (e.g. *what happened then?*) and an answer sentence to that question signed by signer I (the critical sentence, which had to be memorized and reproduced by the participants). In order to avoid that participants simply copy the sentence, the context of signer I followed by the question of signer II was repeated. Following this repetition, the participant was asked to produce the critical sentence. The following figure 18 illustrates the overall task structure.

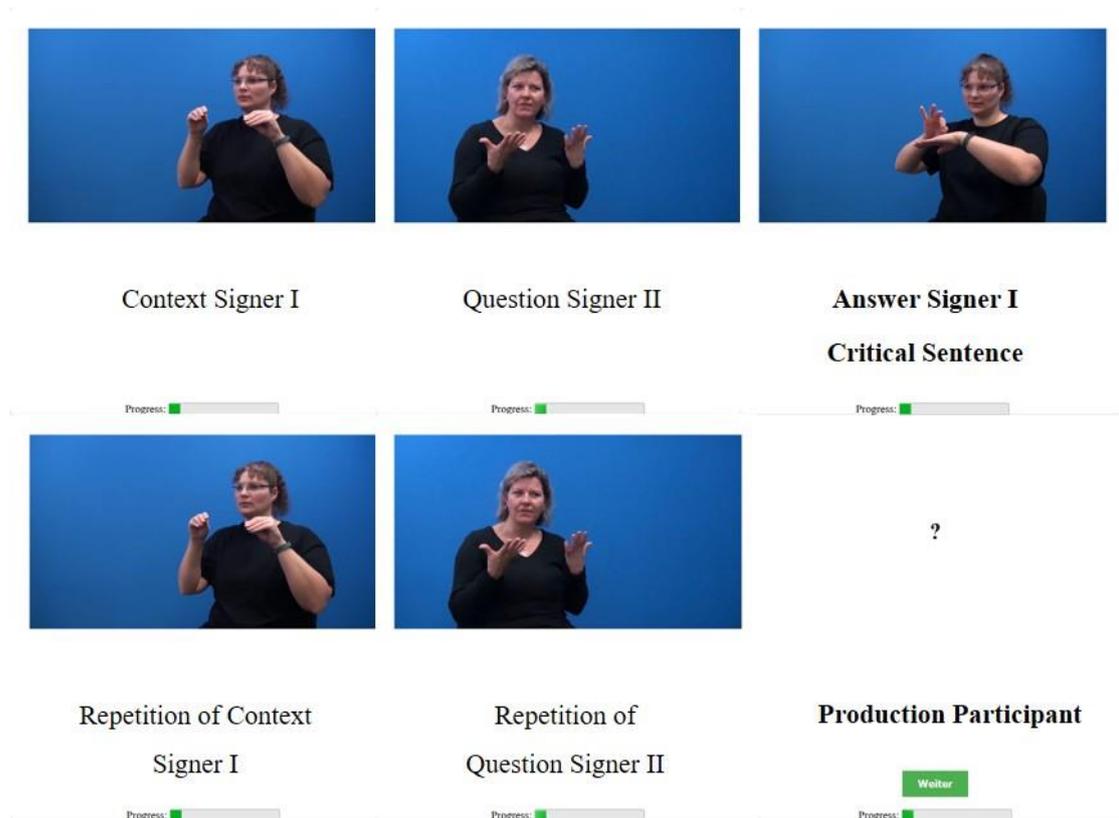


Figure 18: Structure of the SRT

The critical sentence, which had to be reproduced, was manipulated according to the position of the verb and according to verb type. In all stimulus sentences the position of the verb was either verb-final, i.e. the last sign in the sentence, or it appeared in a non-final position. Furthermore, verbs were divided into five different types: plain verbs, forward agreement verbs, backward agreement verbs, spatial verbs and handling verbs, which can be used in classifier constructions and do not belong to the group of spatial verbs.

For each verb class, eight verbs were included¹⁹. In the following, the verbs used in the stimulus sentences are listed (for pictures of the verbs see the appendix: stimulus verbs):

¹⁹ An exception was made for the group of backward agreement verbs. For this group, it was decided to test only common backward agreement verbs. As a result, only four verbs were used which appeared twice in the stimulus set.

- plain verbs: CRY, DIE, BURN, HIKE, LOOK-FOR, REPEAT, LOVE, CHOOSE
- forward agreement verbs: INFORM, EXPLAIN, ASK, GIVE-AS-A-PRESENT, HELP, SEND, SHOW, TEASE
- backward agreement verbs: PICK-UP, INVITE, TAKE, ACCEPT
- spatial verbs: SIT, STAND, LIE, PUT, HANG, LIFT, DRIVE, GO
- handling verbs: EAT, WEAR, CLOSE, OPEN, CARRY, POUR, DIG-OUT, THROW

Different criteria were applied in order to decide which verbs belong to the above-mentioned types. For plain verbs, it was distinguished whether they involve contact with the body²⁰ (CRY, HIKE, LOOK-FOR, LOVE) or not (DIE, BURN²¹, CHOOSE, REPEAT). On the other hand, it was crucial whether they are intransitive (CRY, HIKE, DIE, BURN) or transitive (LOVE, CHOOSE, REPEAT, LOOK-FOR). Forward agreement verbs were distinguished according to their agreement patterns. Agreement can be realized by modulating path movement (ASK, GIVE-AS-A-PRESENT, HELP), by orientation of the fingertips (INFORM, EXPLAIN, TEASE) and by a modulation of both, path movement and orientation of the fingertips (SEND, SHOW). For spatial verbs, local verbs (SIT, STAND, LIE, PUT, HANG, LIFT) were distinguished from directional verbs (DRIVE, GO). Furthermore, those spatial verbs involved a classifier handshape. The group of handling verbs includes handling classifiers, which appear in transitive sentences. For backward agreement verbs, no further criteria were applied. The following tables give an overview of verb categorization for plain, forward agreement and spatial verbs.

Table 9: Criteria used for plain verbs

	Body-anchored	Not body-anchored
Intransitive	CRY, HIKE	DIE, BURN
Transitive	LOVE, LOOK-FOR	REPEAT, CHOOSE

²⁰ My definition of body contact also included signs whose place of articulation is specified for a particular region in the signing space which is close to the body. LOOK-FOR, for instance, is signed close to the signer's eyes.

²¹ While creating the stimuli verbs, my informant signed the verb BURN without body-contact, in particular, without contact with both hands. During the recordings, I later recognized that for some participants the verb BURN involves contact with both hands.

Table 10: Criteria used for forward agreement verbs

Path movement	ASK, HELP, GIVE-AS-A-PRESENT
Finger orientation	INFORM, EXPLAIN, TEASE
Path movement and finger orientation	SEND, SHOW

Table 11: Criteria used for spatial verbs

Local	SIT, STAND, LIE, PUT, HANG, LIFT
Directional	DRIVE, GO

Due to the manipulation of verb position (verb-final and non-verb-final) and verb type (plain, forward agreement, backward agreement, spatial and handling verbs), ten different conditions were tested. Eight stimuli sentences were created for each of the conditions, which resulted in 80 critical sentences ($2 \times 5 \times 8 = 80$). The list of stimuli sentences is provided in the appendix: list of stimulus sentences.

These manipulated sentences were combined with eight different contexts which were presented either in SOV or SVO order and matched the order of the manipulated stimulus sentences. Each context was created according to the following criteria: (i) length of five sentences, (ii) time specification at the beginning (four contexts play in the future, four contexts in the past), (iii) establishment of not more than two referents, (iv) no negation marking and (v) exclusion of the critical verb presented in the answer sentence. Example (106) demonstrates a context combined with question and answer sentence (all other contexts can be found in the appendix: list of stimulus sentences).

other more than twice, (ii) sentences with the same order may follow each other but not more than three times and (iii) the same contexts cannot appear one after another.

All DGS sentences were signed by Deaf informants (stimulus sentences and contexts by two Deaf female signers, the filler questions by one Deaf male signer) and presented within a programmed questionnaire using OnExp (Onea 2011). The structure of the questionnaire and the procedure of data elicitation will be explained in the following section.

5.4 Questionnaire programming and procedure

Data elicitation and recordings took place at different places in Germany from August-September 2017 and September-November 2018. Seven participants were filmed at the Experimental Sign Language Laboratory at the University of Goettingen, four in a seminar room of the University of Goettingen and five in a seminar room at the University of Hamburg. The recording of six participants took place at their private homes.



Figure 19: Different settings of the study

The stimulus sentences were presented within an online questionnaire programmed with OnExp (Onea 2011). OnExp was developed at the Center for Text structures at the University of Goettingen and allows to include audio and video files in the questionnaire. The questionnaire was divided into six different stages: (1) welcome video (2) metadata (3) instruction (4) practice trial (5) stimuli and (6) final video, which thanked the participants for their contribution. All videos, except for the practice and stimulus videos, were signed by a native male Deaf informant.

In the beginning of the questionnaire, participants watched a welcome video signed by a male Deaf DGS signer who explained the overall procedure of the study. Hereafter, participants filled in some personal information (name, age, hearing status) and information about their educational background (school).

The screenshot shows two side-by-side questionnaire forms. The left form is titled 'Persönliche Daten:' and contains the following fields: 'Vorname:' (text input), 'Nachname:' (text input), 'Geschlecht:' (dropdown menu with 'Bitte auswählen'), 'Alter:' (text input with a calendar icon), 'Wohnort:' (text input), 'E-Mail:' (text input), 'Ich bin:' (dropdown menu with 'Bitte auswählen'), 'Ich bin taub/schwerhörig/hörend seit:' (text input), 'Mein Vater ist:' (dropdown menu with 'Bitte auswählen'), and 'Meine Mutter ist:' (dropdown menu with 'Bitte auswählen'). Below these fields is a green button labeled 'Weiter' and a progress bar labeled 'Progress:'. The right form is titled 'Sprache:' and contains the following fields: 'Ich kommuniziere hauptsächlich über:' (dropdown menu with 'Bitte auswählen'), 'Meine bevorzugte Sprache ist:' (text input), 'Ich lerne DGS seit:' (text input), 'Ich war auf folgender Schule:' (dropdown menu with 'Bitte auswählen'), 'Name der Schule:' (text input), and 'Ort der Schule:' (text input). Below these fields is a green button labeled 'Weiter' and a progress bar labeled 'Progress:'.

Figure 20: Screenshot of the participants' metadata questionnaire

In the following DGS instruction video, the participants were informed about the procedure of the current assignment. It was explained that they were going to see a conversation between two signers and that their task would be to pay attention to the content of the conversation and to memorize the answer sentence of signer I. Afterwards, the participants were asked to repeat the signs that they had seen beforehand. Before starting with the experiment, four practice trials had been carried out. Each of them had followed the structure of the following assignment and hence consisted of the sequence context, question, answer, context and question. Two different contexts and answer sentences had been prepared which were shown twice with different word order. During the practice trials, participants had the chance to ask clarifying questions.

After the practice trial the actual experiment with 40 stimulus sequences started. The sequences consisted of a short context by signer I followed by a question of signer II and an answer sentence to that question by signer I. Next, there was a three second pause (shown by a timer, which counted down) before the context of signer I and the question of signer II were repeated. At the end, a question mark appeared which signaled to produce the memorized answer sentence.

The participants who were present at the Experimental Sign Language Laboratory were seated in front of a projector that presented the questionnaire. For all other participants, the questionnaire was presented on a laptop screen. The participants' responses were filmed with one camera. It is important to know that the (hearing) author was present during the elicitation sessions but questions and discussions were carried out in DGS. Overall, the data elicitation lasted about 90 minutes and participants were able to have a break in between. After the recordings were finished, all participants were paid for their participation and filled in additional metadata. Before the elicitation study started, all participants also filled in consent forms in written German.

5.5 Transcription and data analysis

After the recording finished, the videos were cut, edited and transformed in mp4.files with Adobe Premiere Pro CS6. They were annotated using ELAN²³ (Crasborn & Sloetjes 2008), an annotating software that was developed at the Max Planck Institute for Psycholinguistics in Nijmegen and which is frequently used in sign language research.

I annotated and analyzed the data according to the following tiers and categories:

- English Translation: English translation of the signed DGS sentence
- Gloss right hand: German gloss of the sign produced with the right hand
- Gloss left hand: German gloss of the sign produced with the left hand
- Grammatical category: the signs were grouped according to the grammatical category they belong to and were labelled as subject, object (direct, indirect or local), predicate, adjunct.
- Input verb: English gloss of the verb used in the stimulus prompt
- Output verb: English gloss of the verb produced by the signer

²³ See Perniss (2012) for an overview of other annotation software used in sign language research.

- Input verb type: verb type of the verb used in the stimulus prompt
- Output verb type: verb type of the verb produced by the signer
- Subject animacy: the subject was coded as either +animate or -animate depending on whether the expression refers to a human entity or not.
- Object animacy: the object was coded as either +animate or -animate depending on whether the expression refers to a human entity or not.
- Input order: the order of the signs used in the stimulus sentences
- Output order: the order of the signs produced by the signer
- Comments: notes concerning the analysis

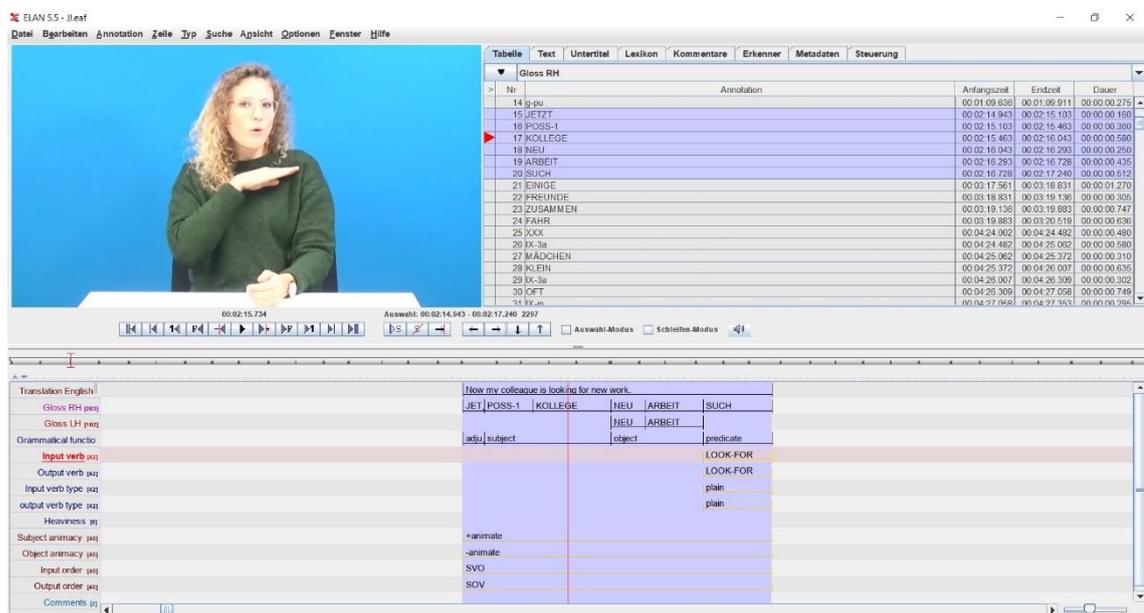


Figure 21: Screenshot of the ELAN annotation

While annotating²⁴ and analyzing the data, I faced several problematic issues regarding the coding of word order. In the following, I will briefly elaborate on it.

At first, the data had to be divided into separate clauses and sentences, which is not a trivial issue in sign languages. It is suggested that non-manual (eyebrow, head and body movements and facial expressions) and manual (lowering of the hands, palm-up gesture, holds) cues are crucial for identifying clause and sentence units (Crasborn 2007; Fenlon et al. 2007; Hansen & Hessman 2007). However, research also shows that these cues are not used systematically and that other factors such as personal signing style and signing speed may influence marking

²⁴ Data annotation should be preferably provided by Deaf coders; however, data annotation was done by myself given the fact that the expected and to be annotated sentences should not vary much from the stimuli sentences which were checked with a Deaf informant.

of clause boundaries (Jahn 2019).²⁵ In previous studies on word order it is not always clear how clauses or sentences were defined and which criteria were used. I mainly followed Kimmelman (2012: 20) who divided the discourse data into clauses and used the following definition for clause determination:

- “A clause consists of a verbal predicate with all its arguments and adjuncts”

However, this issue is complicated by the fact that sign languages often make use of verb doubling. Therefore, I treat clauses or sentences containing more than one verb in line with Kimmelman (2012). He considers occurrences with verb doubling to be one clause if both verbs are identical or if they differ according to aspect, agreement or non-manual marking. Additionally, both verbs have to refer to the same event as in (108).

(108) IX_{1pl}++ GO_{cl}. BOSS IX_{loc} OFFICE GO_{cl}. [DGS]
 ‘We go to the boss’s office.’

The following examples, however, illustrate cases with two different verbs, which I treated as separate clauses.

(109) [DGS]
 a. POSS₁ FRIEND PERSON IX_{dem} OFTEN WOODS HIKE CLIMB
 ‘My friend, this person, often goes hiking in the woods and (she) climbs (there).’
 b. IX YEAR GRANDMOTHER GRANDFATHER BOTH ALSO FRIENDS INVITE++
 TOGETHER CELEBRATE
 ‘This year, the grandparents also invited friends and (they) celebrate together.’

Furthermore, the issue of simultaneity (as previously described in section 2.3.1) complicates word order coding. Signers use different articulators (two hands, the face, the torso) which allow them to express different signs and meanings simultaneously. In my data simultaneous constructions like (110) occurred.

²⁵ Loos (2018) discusses several semantic and syntactic diagnostics for distinguishing coordinated and subordinated structures and evaluates their applicability to DGS. While a copy of subject pronoun can occur with embedded structures, it is ungrammatical in coordinated structures and can thus serve as a diagnostic to differentiate between coordinated and subordinated clauses. However, she shows that the scope of manual negation does not function as a clause-hood diagnostic in DGS.

(110)h1: TOMORROW PASTOR IX_{loc} BASIN WATER POUR [DGS]

h2: BASIN -----

‘Tomorrow, the pastor will pour water into the basin.’

In this example, the sign BASIN was signed first and held on the left hand, while the right hand signed WATER and POUR (the signer was right-handed). In such cases, the sign BASIN was signed before the other signs; hence, they were analyzed as displaying a sequential order.

Moreover, it is not always easy to distinguish nouns from verbs because both often look similar in sign languages. It has been claimed that verbs and nouns show different movement patterns. In particular, the movement of nouns is shorter, more reduced and often repeated compared to verbs whose movement is slower, laxer and larger. Hence, the duration of verbs might be longer than the duration of nouns (Hunger 2006; Johnston 2001; Kimmelman 2009; Supalla & Newport 1978). Moreover, Kimmelman (2009) observed that nouns and verbs can differ in handshapes and orientation of the hands and he found that mouthing is more common with nouns than verbs in RSL. There is no research on that in DGS; thus, I used movement, handshape, orientation and mouthing similar as described by Kimmelman as well as the surrounding context as criteria for noun/verb distinction in my data. The following example demonstrates how the orientation of the hands is crucial for word class determination. In (111), TEACH is treated as a verb and not as the noun CLASS because it behaves like an agreement verb. The hand and fingertips are orientated towards the ipsilateral side of the signing space where the students were previously located (see figure 22). A noun like CLASS, however, would be expected to be orientated towards the neutral signing space.

(111)TEACHER_{3b} FOR_{3a} STUDENT_{3a} AGAIN TOPIC_{3b} TEACH_{3a 3b} EXPLAIN_{3a} [DGS]

‘The teacher teaches the students the topic again and explains (it) (to them).’



Figure 22: Noun/verb distinction exemplified based on the verb TEACH

While annotating the data, several decisions were made regarding the labelling and coding of arguments. As it is common practice in typological research and similar done by Kimmelman

- (113) [DGS]
- a. IX_{loc} CHRISTMAS TREE COLOR BALL EXIST g-pu
‘There are colorful balls on the Christmas tree.’
- b. GIRL LIKE DOLL PLAY
‘The girl likes playing with the doll.’
- c. POSS₁ FRIEND_{3b} RPRO-H BIRTHDAY ALSO PAM_{3a} POSS EX_{3a} INVITE_{3b}
‘My friend who has birthday also invited my ex.’

Among the six logically possible word orders, (SOV, SVO, VSO, VOS, OVS and OSV) SOV, SVO, OVS and OSV orders were attested. The data show that in DGS, as in sign languages in general, subject and object arguments can be omitted and verbs can be doubled resulting in various orders as illustrated in figure 23.

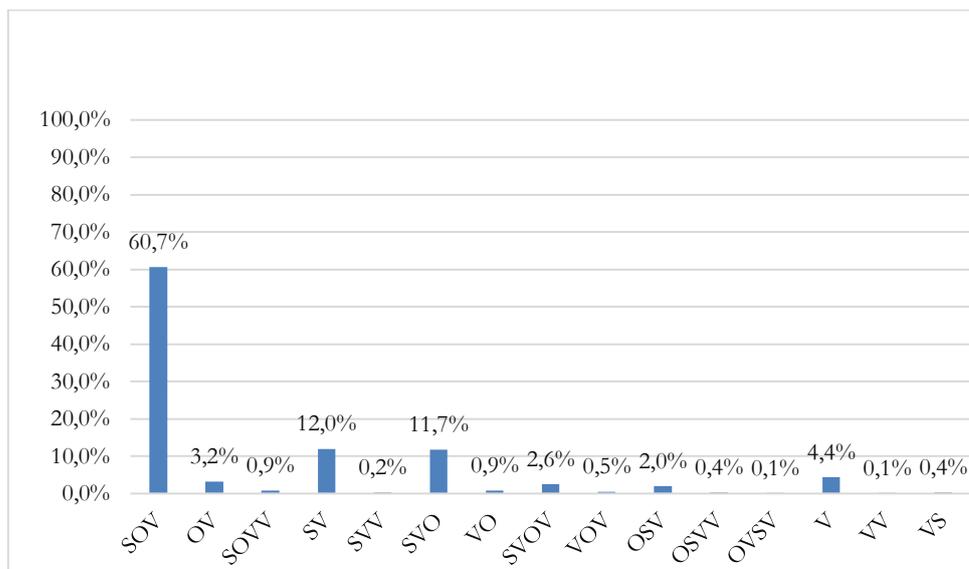


Figure 23: Overall proportions of word order patterns

The overall picture shows that SOV is the most common word order observed in DGS across all verb types (60.7%). The second most common word order is SV (12%), which includes intransitive plain verbs as (114)a) or other verb types with omitted object arguments as (114)b) and nominal and adjectival predicates as in (114)c). SVO is the third most common word order and was used in 11.7% of clauses.

- (114) [DGS]
- a. LAST YEAR GRANDMOTHER HOSPITAL DIE
 S V
 ‘Last year, grandmother died in the hospital.’
- b. EVENING MOTHER IX_{loc} CLOSE_{cl}
 S V
 ‘In the evening, the mother closes (the door) downstairs.’
- c. POSS_{3a} GIRL NICE DOLL
 S V
 ‘Her daughter has a nice doll.’

All other attested orders were rarely used. 2.6% showed a SVOV pattern. The literature distinguishes between verb echoes (two identical occurrences of the verb) and verb sandwiches (one verb is more marked compared to the other) (Fischer & Janis 1990). Out of the 21 cases with SVOV pattern, the verbs looked and behaved the same in 14 cases and can thus be classified as verb echoes (115)a). In seven cases one verb was more marked compared to the other verb. However, it was not always the second occurrence of the verb which received more marking. In three cases the first verb occurrence was more marked as in (115)b). Here, the first verb received an additional non-manual marking. In four cases the second verb was more marked as for instance in (115)c) where the verb is reduplicated.

- (115) [DGS]
- a. IX_{1pl} GO_{cl}.BOSS OFFICE GO_{cl}.
 S V O V
 ‘We go to the boss’s office.’
- lip
- b. IX_{1pl} GO_{cl}.BOSS IX_{loc} OFFICE GO_{cl}.
 ‘We go to the boss’s office.’
- c. TEACHER ALWAYS REPEAT IMPORTANT TOPIC REPEAT++
 ‘The teacher always repeats the important topics.’

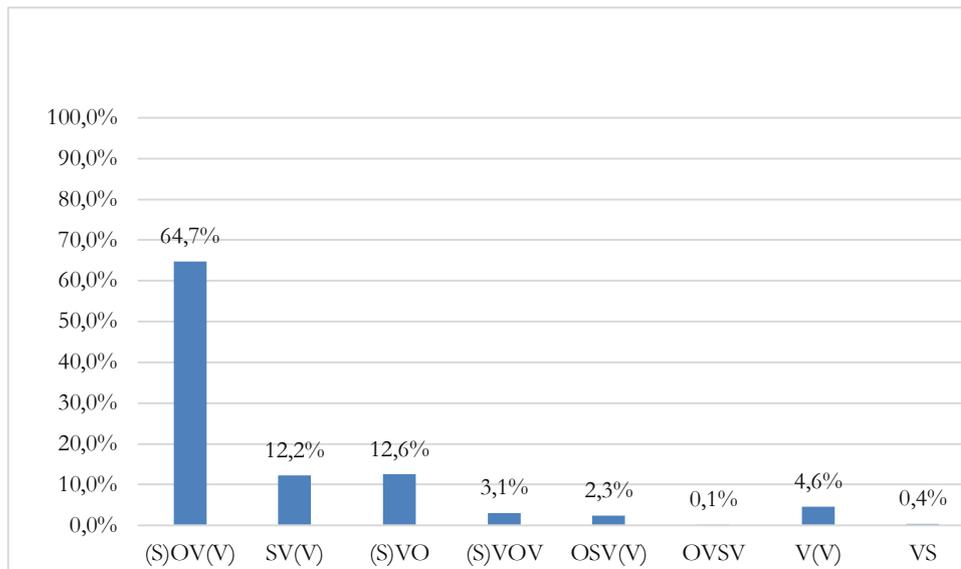


Figure 24: Word orders grouped in DGS

5.6.2 Verb position of input order compared to output order

Considering the input order, or more precisely, the position of the verb presented in the stimulus sentences, the following results were found. Figure 25 presents the realized orders regarding the stimulus sentences that involved a verb used in sentence-final position. The results are based on 372 clauses. Here, the majority of clauses was realized with verb-final order. 77.2% of clauses showed a (S)OV(V) order, while SVO was used in 5.1% of clauses. The clauses used with SVO order mainly involved forward or backward agreement verbs (7 clauses with agreement verbs and 6 clauses with backward verbs). Out of these clauses, five clauses involved a modified agreement verb, all other clauses with forward or backward agreement verbs were not modified for agreement purpose. Only five of the 19 clauses with SVO order contained plain verbs.

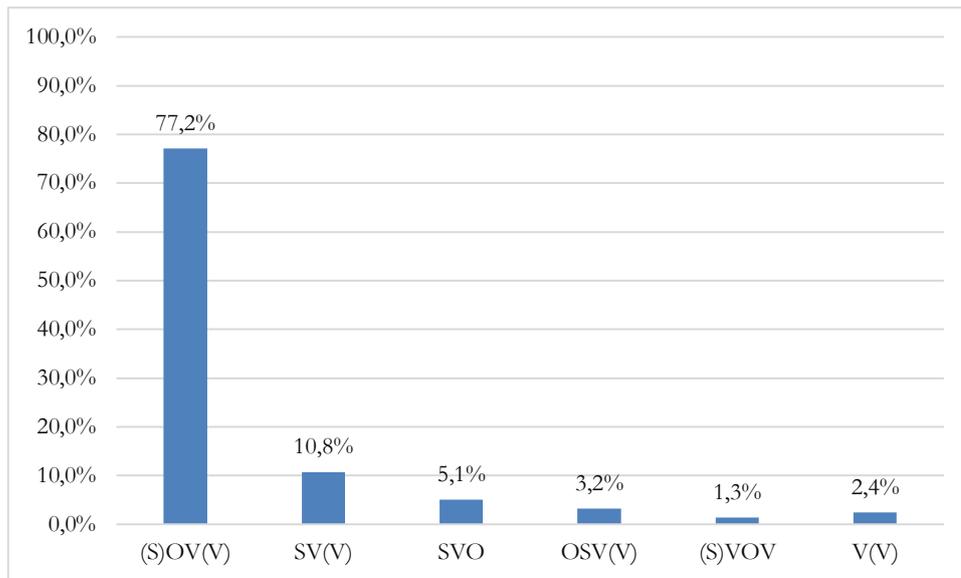


Figure 25: Resulting orders of verb-final stimuli

Figure 26 presents the realized orders with regard to the stimulus sentences in which the verb was realized in non-final position based on 376 clauses. Here, the most common order was again (S)OV(V) but compared to the stimuli with verb-final position more variation regarding the realized orders was observed. The second most common order is (S)VO (21.3%), which is much more than in the verb-final stimuli. Interestingly, the SVO clauses, which were not changed but stayed in SVO order, mainly involved forward and backward agreement verbs as well. Out of 73 clauses, 17 clauses involved a forward agreement verb, 22 a backward agreement verb and 21 clauses were signed with a plain verb. Out of the 39 clauses with forward or backward agreement verb, eight clauses showed agreement modification.

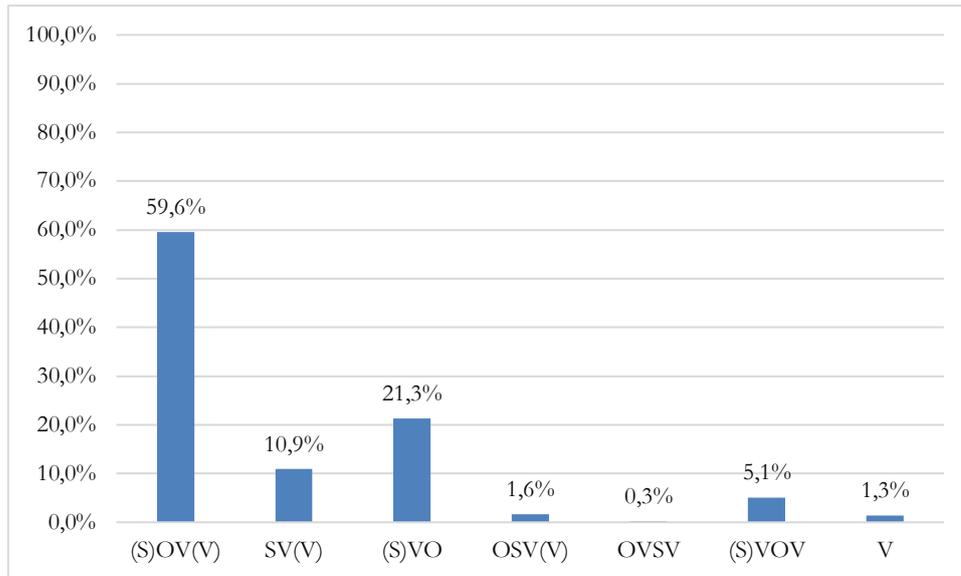


Figure 26: Resulting orders of non-verb-final stimuli

Figure 27 shows the orders that were realized without having a stimulus prompt (63 clauses). Here, the picture is different. The most common order was a single verb (36.5%) followed by a SV order (28.6%). 22.2% of clauses showed a (S)OV order and other orders (SVO, OSV, VOV and VS) occurred only marginally.

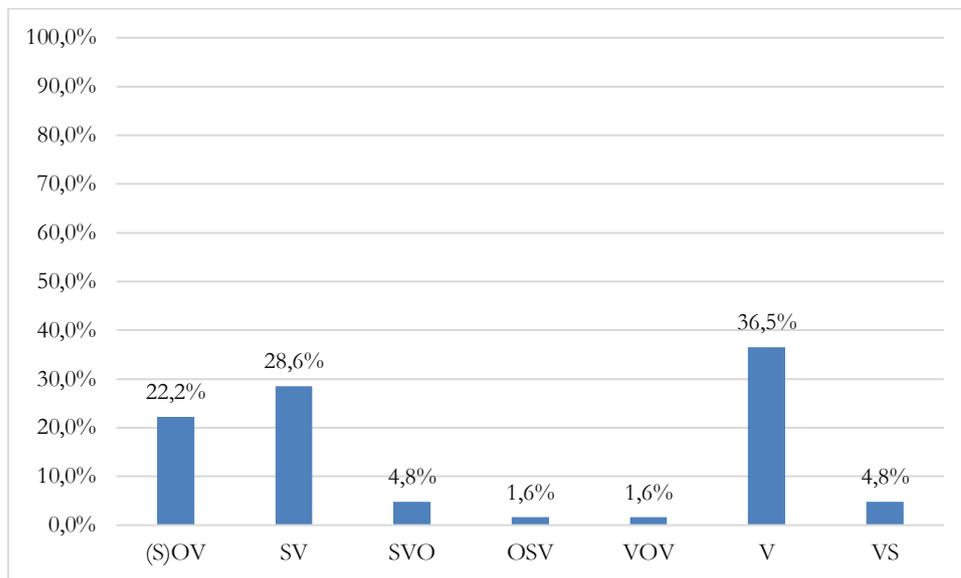


Figure 27: Resulting orders without previous stimuli

5.6.3 Plain verbs

The analysis is based on 179 clauses containing plain verbs. The general picture is presented in figure 28.

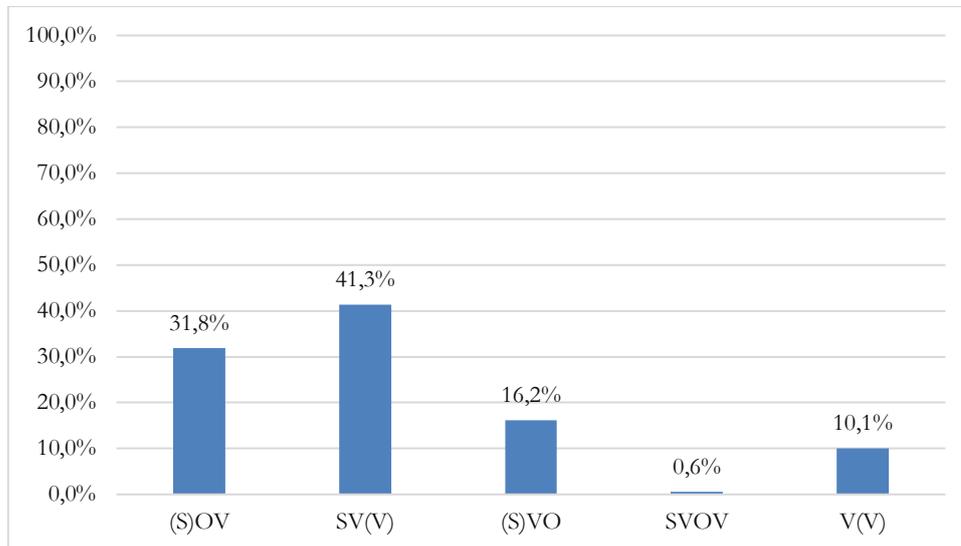


Figure 28: Word order with plain verbs

The most common word order found with plain verbs is SV(V) (74 out of 179 clauses, 41.3%). In every case SV was used with an intransitive plain verb as in (120).

(120) LAST YEAR GRANDMOTHER HOSPITAL DIE [DGS]
 ‘Last year, grandmother died in the hospital.’

(S)OV used with transitive plain verbs is the second most common word order (31.8%), which is exemplified in (121)a) and (121)b).

(121) [DGS]
 a. POSS₁ PARENTS NICE FLOWERS CHOOSE
 ‘My parents choose nice flowers.’
 b. TOPIC CONTENT REPEAT
 ‘(Teacher) repeats the topic.’

16.2% of the transitive clauses with plain verbs occurred with (S)VO order. (S)VO was most used with the plain verb LIKE (122)a), followed by the verbs LOOK-FOR (122)b) and REPEAT (122)c).

- (122) [DGS]
- a. GIRL PERSON LIKE POSS_{3a} NICE DOLL
‘The girl likes her nice doll.’
 - b. POSS₁ COLLEAGUE LOOK-FOR NEW WORK
‘My colleague is looking for a new job.’
 - c. TEACHER ALWAYS REPEAT₊₊ CONTENT
‘The teacher always repeats the topics.’

10.1% of the clauses just consisted of a single verb sign. In one out of these clauses, the verb was doubled and coded as VV (123).

- (123) CRY₊₊ OFTEN CRY₊₊ [DGS]
‘(She) cries a lot.’

One clause was found with an SVOV structure (124).

- (124) TEACHER ALWAYS REPEAT IMPORTANT TOPIC REPEAT₊₊ [DGS]
‘The teacher always repeats the important topics.’

Subject drop concerns all orders identified as OV and VO. Furthermore, all clauses consisting of just a verb and coded as V are assumed to involve an omitted subject argument. Three clauses were found with a subject omission resulting in an OV pattern, which is demonstrated in (125).

- (125) [DGS]
- a. HIKE LIKE g-pu
‘(She) likes hiking.’
 - b. TOPIC CONTENT REPEAT
‘(He/she) repeats the topic.’
 - c. LIBRARY IX_{loc} MEET
‘(We) are meeting at the library.’

Two clauses with an omitted subject argument were identified that had a VO order shown in (126)a) and (126)b).

- (126) [DGS]
- a. CHOOSE NICE FLOWER
'(They) choose nice flowers.'
- b. PAM_{3b} LIKE POSS_{3b} DOLL
'(She) likes her doll.'

Moreover, 17 clauses with just a single verb occurred in the data as presented in (127)a). One clause was found with VV order, which is repeated here as (127)b).

- (127) [DGS]
- a. UNFORTUNATELY BURN g-pu
'Unfortunately, (the cake) burned.'
- b. CRY++ OFTEN CRY++
'(She) cries a lot.'

Table 12: Subject drop with plain verbs

	1. person	3. person
OV	1	2
VO		2
V	2	15
VV		1

5.6.4 Forward agreement verbs

The analysis of forward agreement verbs is based on 167 clauses and presented in figure 29.

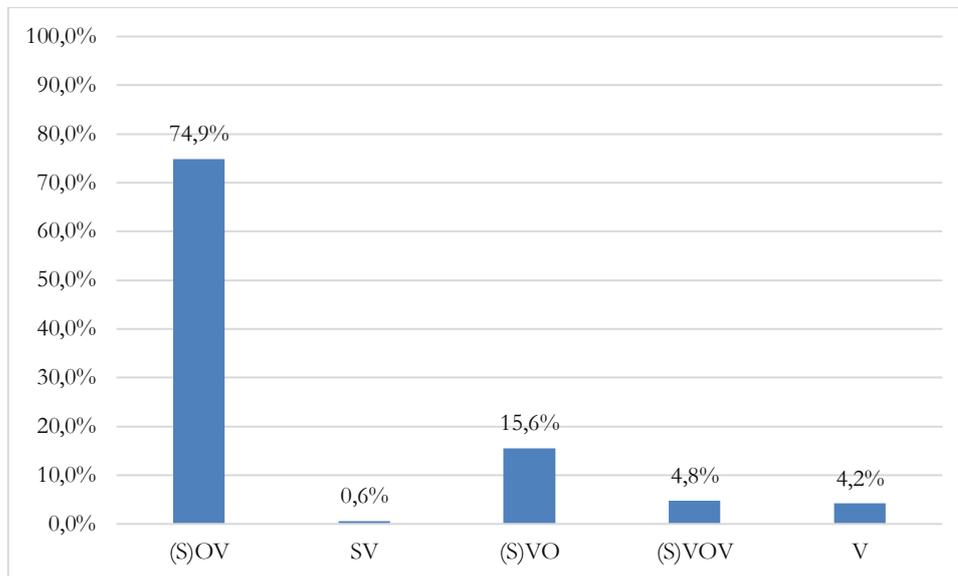


Figure 29: Word order with forward agreement verbs

The majority of agreement verbs (74.9%) was used with a (S)OV structure. This concerns transitive (128)a) and ditransitive agreement verbs (128)b).

- (128) [DGS]
- a. IX_{3a} BOY_{3a} ALWAYS SISTER_{3b} _{3a}TEASE_{3b}
 ‘The boy always teases (his) sister.’
- b. TEACHER PAM_{3b} STUDY#PERSON_{3b}++ CONTENT _{3a}EXPLAIN_{3b}
 ‘The teacher explains the topic to the students.’

15.6% of clauses with an agreement verb were used with a (S)VO structure involving transitive (129)a) as well as ditransitive verbs (129)b).

(129) [DGS]

a. IX_{3a} MOTHER OFTEN INFORM++ CHILD++

‘The mother often informs the children.’

b. POSS₁ FATHER_{3a} SHOW_{3b} GRANDMA_{3b} GARDEN

‘My father shows grandma the garden.’

4.8% of clauses occurred with verb doubling. Five clauses appeared in a SVOV order as in (130)a) and three clauses in a VOV order shown in (130)b).

(130) [DGS]

a. FATHER_{3b} PAM_{3a} GRANDMOTHER_{3a} SHOW_{3a} GARDEN#PLACE_{3b} SHOW_{3a}

‘Father shows grandmother the garden.’

b. VISIT GRANDMA GRANDPA VISIT

‘I visited (my) grandparents.’

SV order was only found in one case (0.6%) as illustrated in (131).

(131) IX_{3apl} GIVE_{3b} [DGS]

‘They gave (her) (something).’

5.6.4.1 Agreement behavior of forward agreement verbs

Out of 125 sentences with a (S)OV order, 105 verbs were modified as in example (128) above (84%), whereas in 20 clauses (16%) the verb did not show any kind of person or number marking as in (132).

(132) IX MOTHER CHILD++ OFTEN INFORM [DGS]

‘The mother often informs the children.’

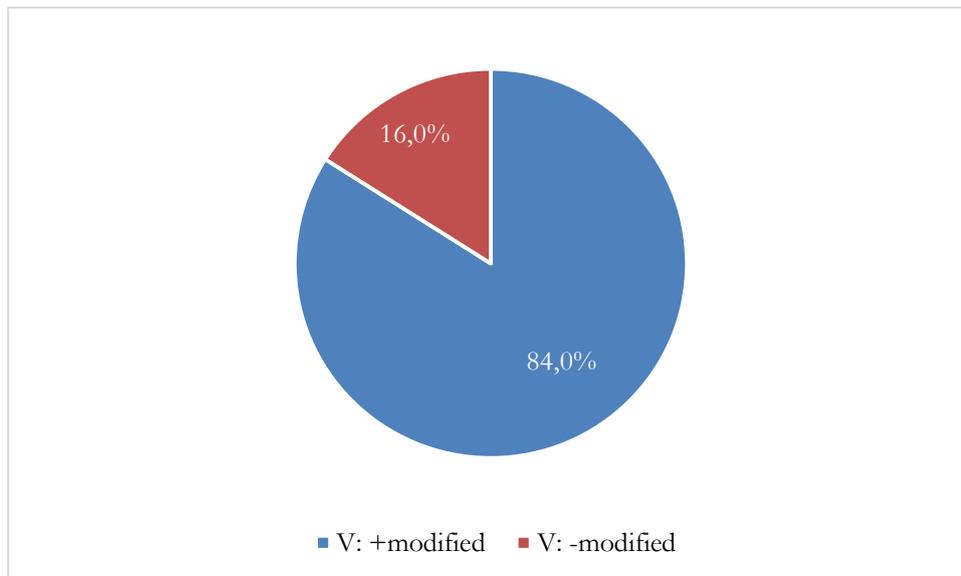


Figure 30: (S)OV order with +/-modified forward agreement verbs

On the one hand, 15 out of 26 clauses with (S)VO structure (57.7%) were used with a modified agreement verb. On the other hand, 11 out of 26 clauses (42.3%) did not show verb modification as in (133)a) (transitive clause) and (133)b) (ditransitive clause).

(133)

[DGS]

- a. POSS₁ MOTHER HELP GRANDMA GRANDPA

‘My mother helps my grandparents.’

- b. TEACHER EXPLAIN STUDENT TOPIC++ AGAIN

‘The teacher explains the topics to the students again.’

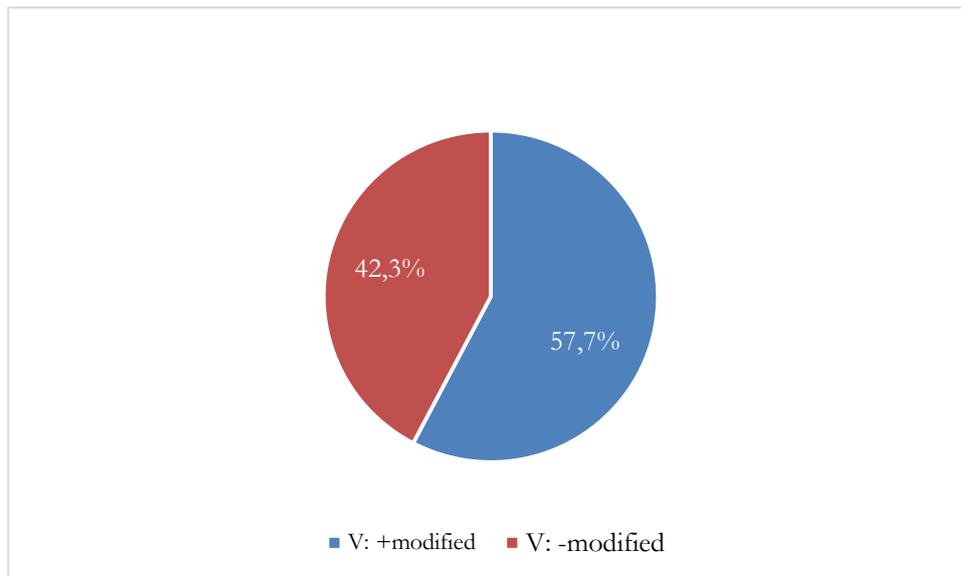


Figure 31: (S)VO order with +/modified forward agreement verbs

5.6.4.2 Subject drop with forward agreement verbs

In seven clauses the subject argument is omitted, which results in an OV structure. In six constructions subject omission concerns the verb ASK and dropping of the personal pronoun IX_{1pl} ('we'). In (134)a), the verb shows no agreement modification, whereas in (134)b) the verb movement is directed towards the locus 3b where PASTOR is localized. Another example with subject omission is found in a clause involving the verb HELP, which also shows a clear path movement modification (134)c). The subject MOTHER was introduced in the clause before.

- (134) [DGS]
- a. BEFORE THREE-MONTH PASTOR ASK
'Three month ago, (we) asked the pastor.'
 - b. BEFORE THREE-MONTH PASTOR_{3b} IX_{3b} 1ASK_{3b}
'Three month ago, (we) asked the pastor.'
 - c. POSS₁ GRANDMA GRANDPA_{3a}HELP_{3b}
'(My mother) helped my grandparents.'

Two instances were found that showed a VO order with an omitted subject argument. Both examples concern the verb ASK and involve agreement marking (135).

(135) [DGS]

- a. BEFORE THREE-MONTH ₁ASK_{3a} PASTOR_{3a}
 ‘Three month ago, (we) asked the pastor.’
- b. BEFORE THREE-MONTH ₁ASK_{3b} PASTOR_{3b} g-pu
 ‘Three month ago, (we) asked the pastor.’

I identified three clauses with a VOV order which involved an omitted subject argument. One example is repeated here as (136).

(136) VISIT GRANDMA GRANDPA VISIT [DGS]

‘I visited my grandparents.’

Furthermore, seven clauses occurred which were coded as V. Six of them show agreement marking as in (137)a), whereas one clause involved an unmodified verb as demonstrated in (137)b).

(137) [DGS]

- a. _{3b}EXPLAIN_{3a}
 ‘(The teacher) explains (it).’
- b. TEACH
 ‘(The teacher) teaches (the students).’

Table 13: Subject drop with forward agreement verbs

	1. person	3. person
OV	6	1
VO	2	
VOV	1	2
V		7

5.6.5 Backward agreement verbs

The results are based on 163 identified clauses presented in figure 32.

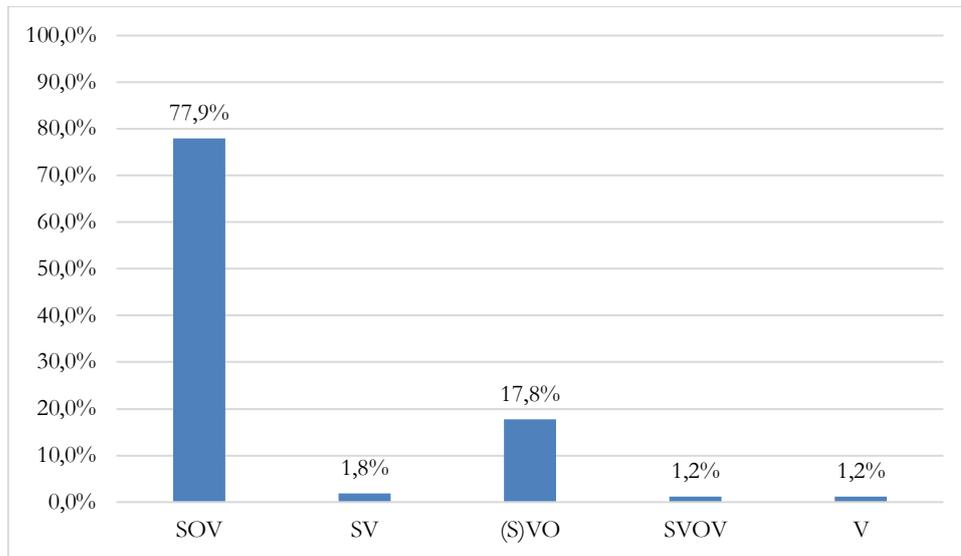


Figure 32: Word order with backward agreement verbs

The vast majority of backward agreement verbs was used with SOV order (127 clauses in total, 77.9%) as in (138)a). (S)VO order was the second most common word order attested in 17.8% of clauses (138)b).

- (138) [DGS]
- a. IX_{dem} YEAR GRANDMOTHER_{3a} GRANDFATHER_{3a} ALSO FRIEND_{3b} 3bINVITE_{3a}
 ‘This year, (my) grandparents also invited friends.’
- b. POSS₁ NEIGHBOR IX_{3a} ACCEPT POSS₁ FAMILY
 ‘My neighbor accepts my family.’

All other observed orders occurred only marginally. Three clauses with SV structure were identified (1.8%), SVOV order was observed with two clauses (1.2%) and two clauses consisted of a single verb (1.2%).

5.6.5.1 Agreement behavior of backward agreement verbs

Out of 127 clauses with SOV structure, almost half of the verbs (56 cases; 44.1%) did not show a clear verb modification as in (139)a), however, in 71 clauses (55.9%) the verb was modified to show person or number marking as in (139)b).

(139)

[DGS]

a. NEW NEIGHBOR POSS₁ FAMILY ACCEPT

‘The new neighbor accepts my family.’

b. EVENING MOTHER_{3a} POSS_{3b} PARTNER_{3b}PICK-UP_{3a}

‘In the evening, the mother picks up her partner.’

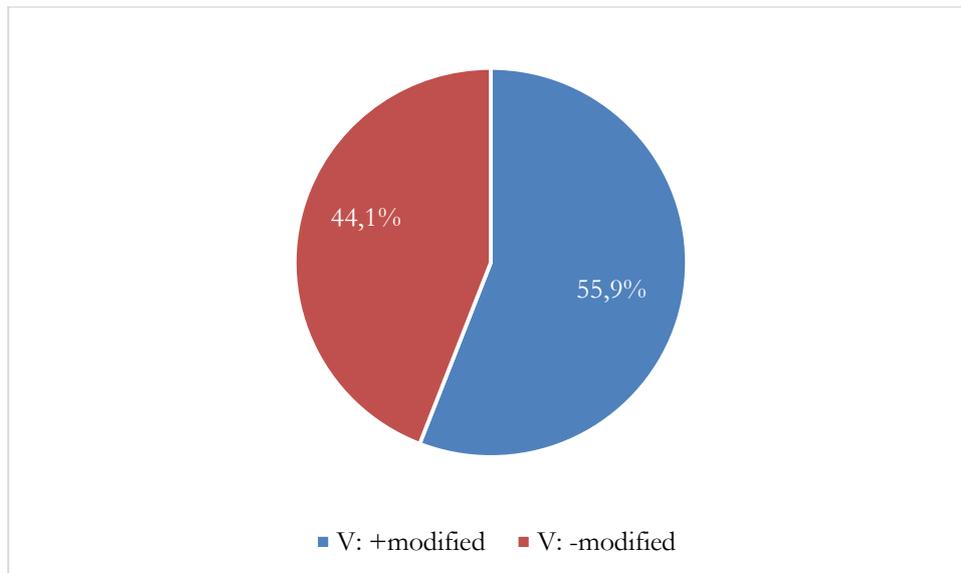


Figure 33: SOV order with +/-modified backward agreement verbs

Interestingly, all clauses with a (S)VO structure (29 clauses) did not show verb modification as exemplified in (140).

(140) POSS₁ FRIEND INVITE ALSO POSS₁ EX

[DGS]

‘My friend also invited my ex.’

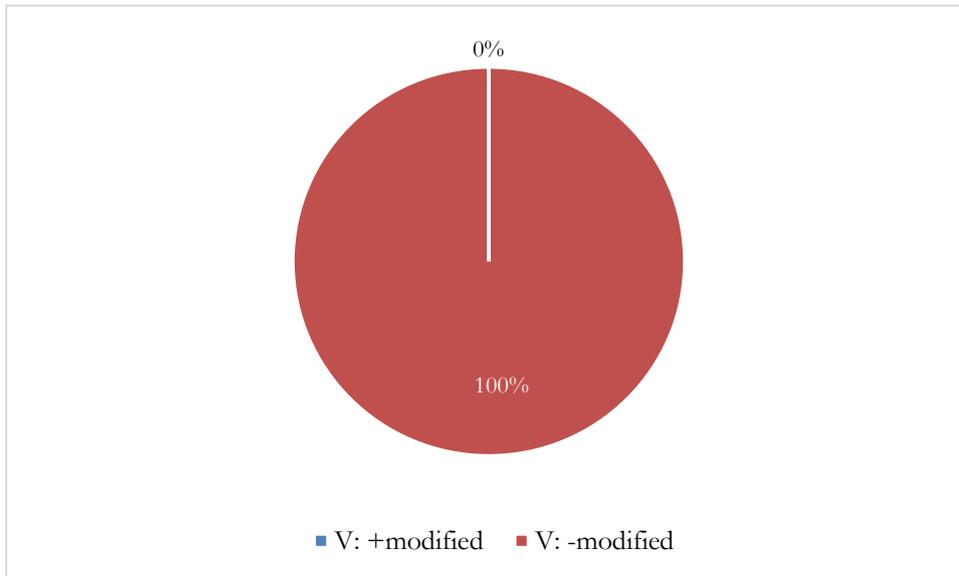


Figure 34: (S)VO order with +/-modified backward agreement verbs

5.6.5.2 Subject drop with backward agreement verbs

Clauses with verb-final order and backward agreement verbs did not show omitted subject arguments. Additionally, only one clause with VO order with an omitted subject argument occurred as shown in (141)a). Furthermore, two clauses identified as V appeared but both showed agreement marking (141)b). In general, subject drop with backward agreement verbs seemed to be rare in DGS.

- (141) [DGS]
- a. INVITE POSS₁ EX PARTNER
'(She) invites my ex-partner.'
- b. _{3a}TAKE₁ g-pu
'(We) take (it).'

Table 14: Subject drop with backward agreement verbs

	1. person	3. person
VO		1
V	1	1

5.6.6 Word order and the agreement marker PAM

Although PAM was not part of the stimulus sentences, it occurred in 66 clauses. In 62 clauses (94%), PAM occurred in a sentence-internal position shown in (142)a). However, four clauses (6%) were realized with a sentence-final PAM as presented in (142)b).

(142)

[DGS]

- a. NEW EMPLOYEE PERSON++ BOSS PAM_{3a} ACCEPT

‘The new employees accept the boss.’

- b. NEW EMPLOYEE PERSON++ BOSS IX_{3b} ACCEPT PAM_{3b}

‘The new employees accept the boss.’

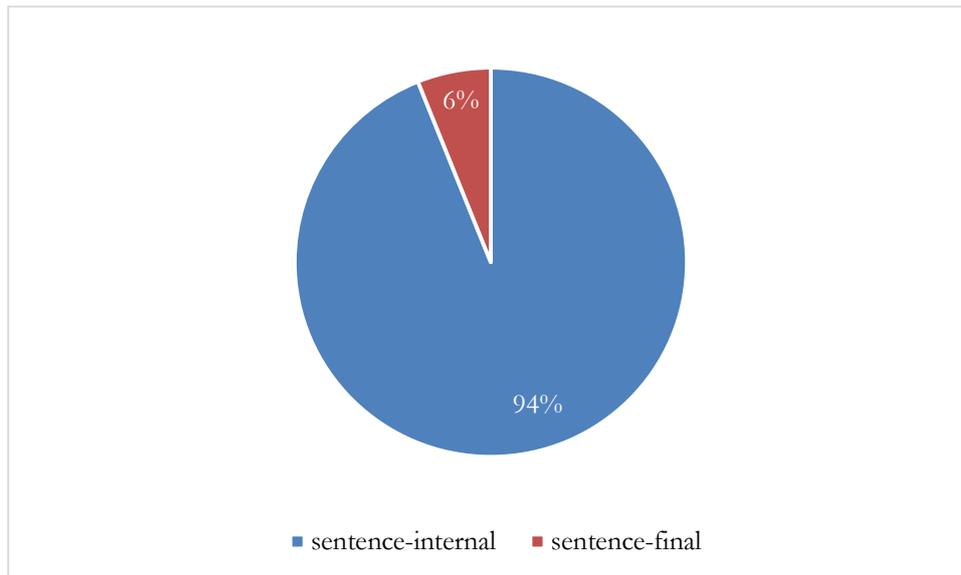


Figure 35: Position of PAM

In the majority of clauses (54 out of 62 clauses), PAM was realized before the direct (143)a) or indirect object (143)b), whereas PAM precedes the verb in three clauses as in (142)a) above.

(143)

DGS]

a. BOY_{3a} PAM_{3b} SISTER_{3b} ALWAYS_{3a} TEASE_{3b}

‘The boy always teases (his) sister.’

b. POSS₁ FATHER_{3b} PAM_{3a} POSS₁ GRANDMOTHER_{3a} GARDEN_{3b} SHOW_{3a}

‘My father shows grandmother the garden.’

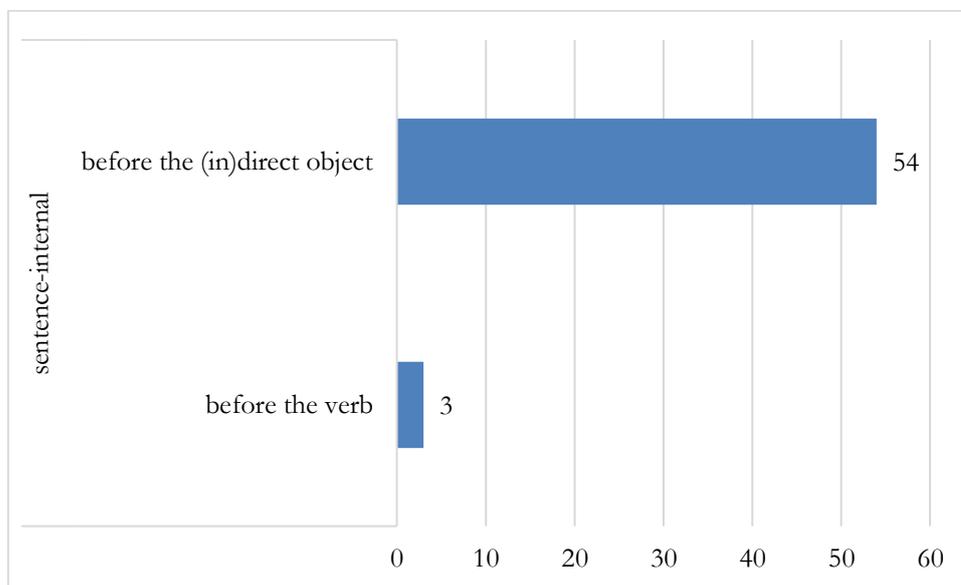


Figure 36: Sentence internal position of PAM

In almost every case, PAM was used in clauses with SOV order. Four clauses with PAM reflect a (S)VO order as the examples (144)a) and (144)b) show. Two clauses were identified yielding a SVOV order. In (144)c) PAM occurred in preverbal and in (144)d) in postverbal position.

- (144) [DGS]
- a. IX_{3b} BOY_{3b} ALWAYS TEASE PAM_{3a} SISTER_{3a}
 ‘The boy always teases (his) sister.’
- b. PAM_{3b} LIKE POSS_{3b} DOLL
 ‘(The girl) likes her doll.’
- c. FATHER_{3b} PAM_{3a} GRANDMOTHER_{3a} _{3b}SHOW_{3a} GARDEN#PLACE _{3b}SHOW_{3a}
 ‘Father shows grandmother the garden.’
- d. TEACHER EXPLAIN PAM_{3b} STUDENT++_{3b} IMPORTANT TOPIC++ EXPLAIN
 ‘The teacher explains the important topics to the students.’

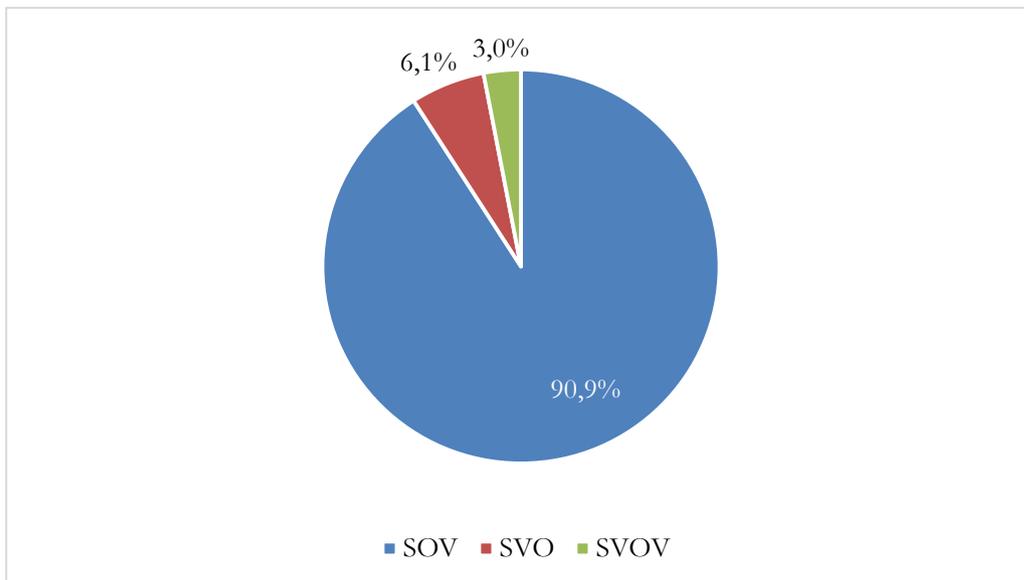


Figure 37: Word order with PAM

In 42 clauses, PAM was realized with a forward agreement verb and in 19 clauses with a backward agreement verb as in (145).

- (145) EVENING IX_{3a} WOMAN _{3a}PAM_{3b} PARTNER IX_{3b} _{3b}PICK-UP_{3a} [DGS]
 ‘In the evening, the woman picks up her partner.’

As demonstrated in the example (145) above, 49 clauses showed an additional verb modification resulting in a kind of double agreement. In twelve clauses, the verb lacked an additional modification and was used in its citation form. Example (145) shows that PAM expresses agreement with subject and object. The path movement of PAM starts at the

location in the signing space that is associated with the subject and ends at the location that matches the object argument. I found ten cases where PAM clearly marked agreement with subject and object. In the other 56 cases, PAM moved from the neutral signing space towards the object or started at the location in space, which was congruent with the previous sign as shown in (146).

(146) FATHER_{3a} PAM_{3b} GRANDMOTHER_{3b} GARDEN_{3a} SHOW_{3b} [DGS]
 ‘Father shows grandmother the garden.’

Five clauses were identified where PAM was used with a plain verb. In (147)a) and (147)b), PAM was used as an agreement marker. However, the examples (147)c)-(147)e) show that PAM was furthermore used to extend the argument structure.

(147) [DGS]

a. PAM_{3b} LIKE POSS_{3b} DOLL
 ‘(The girl) likes her doll.’

b. IX_{dem}++ GIRL PAM_{3a} POSS_{3a} DOLL LOVE
 ‘This girl loves (her) doll.’

c. TEACHER PERSON PAM STUDENT++ REPEAT
 ‘The teacher repeats (it) for the students.’

d. TEACHER PAM_{3b} EVERY STUDENT CONTENT REPEAT
 ‘The teacher repeats the content for the students.’

e. WORK#COLLEAGUE IX_{3b} WAIT PAM_{3b} WORK
 ‘A colleague waits for a job.’

5.6.7 Spatial verbs

The results of spatial verbs are based on 124 clauses. Clauses involving the verbs STAND and DRIVE had to be excluded from the analysis because the stimulus sentences involved an existential marker which seemed to have an influence on word order in DGS. The overall results are presented in figure 38.

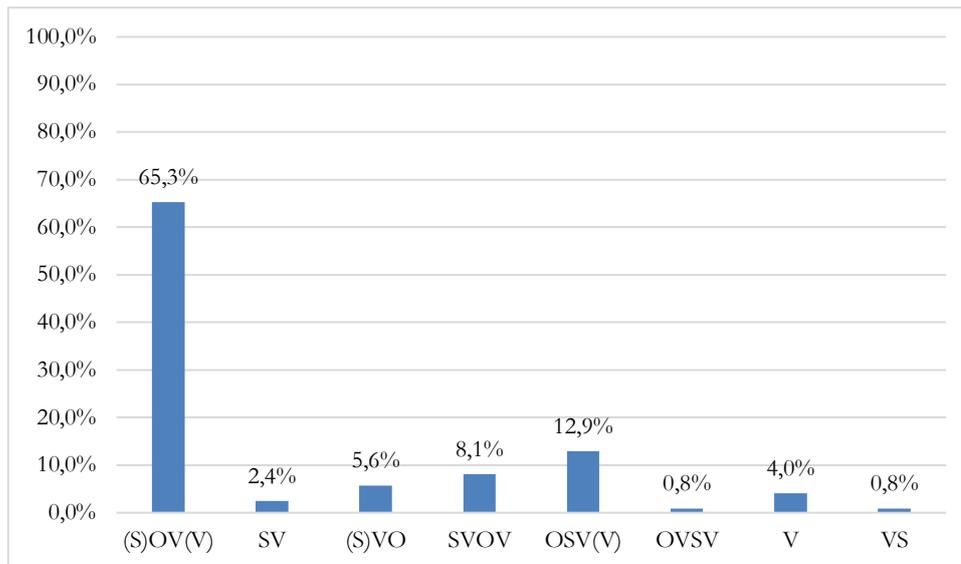


Figure 38: Word order with spatial verbs

Two third of the clauses were realized with a (S)OV(V) order (65.3%). 68 clauses had a SOV order as (148)a). Five clauses were found with a SOVV order shown in (148)b).

(148) [DGS]

a. EVENING CHILD++ POSS_{3apl} BED LIE_{CL}++

b. EVENING CHILD++ BED LIE_{CL} lip LIE_{CL}
 ‘In the evening, the children lie in their bed.’

The second most common word order is OSV(V), which was found in 12.9% of clauses. Almost every clause that shows an initial object involved the verb SIT as demonstrated in example (149)a). Three instances were found involving the verb GO (149)b).

(149) [DGS]

a. IX_{loc} GARDEN FAMILY TOGETHER SIT_{CL}

‘The family sits together in the garden.’

b. IX_{loc} BOSS POSS_{3a} OFFICE IX_{1pl} GO_{CL}

‘We go to the boss’s office.’

SVOV appeared in 8.1% of clauses and is exemplified in (150).

(150) IX_{1pl} GO_{CL} BOSS OFFICE GO_{CL} [DGS]
 ‘We go to the boss’s office.’

(S)VO order occurred in 5.6% of clauses (151).

(151) AFTER EVENING #EAT CHILD++ LIE_{CL} BED [DGS]
 ‘After dinner, the children lie in bed.’

Three clauses showed a SV order as in (152)a) and one clause had a VS order repeated here as (152)b).

(152) [DGS]
 a. THEN POSS₁ CHILD++ LIE_{CL}
 ‘Then my children lie (there).’
 b. TOMORROW COME ONE PASTOR
 ‘Tomorrow, one pastor will come.’

The only clause that revealed an OVSV order was used with the spatial verb LIFT and is repeated as (153).

(153) HEAVY SUITCASE LIFT_{CL} FATHER IX_{loc} CAR LIFT_{CL} [DGS]
 ‘The father lifts heavy suitcases into the car.’

Eight clauses displayed an OV order as exemplified in (154)a) and two clauses were realized as VO (154)b).

(154) [DGS]
 a. NOW TABLE GLASS++ PUT_{CL}
 ‘Now, (we) put the glasses on the table.’
 b. LIE_{CL} BED
 ‘(The children) lie in bed.’

Five clauses were identified that consisted of a single spatial verb as shown in (155).

(155)STT [DGS]
'(They) sit (there).'

Table 15: Subject drop with spatial verbs

	1. person	3. person
OV	2	6
VO	1	1
V	1	4

5.6.8 Handling verbs

The results are based on 155 clauses and are presented in figure 39.

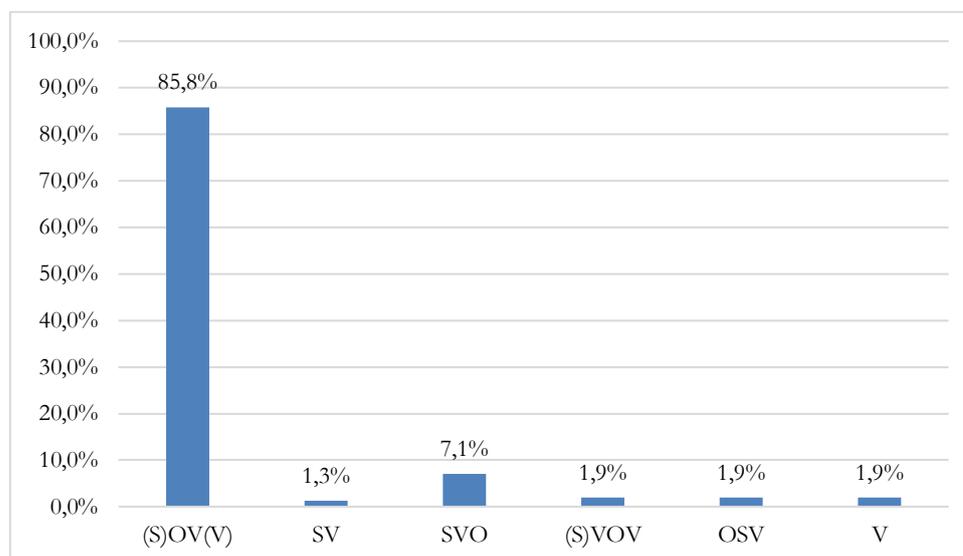


Figure 39: Word order with handling verbs

The most common word order with handling verbs was (S)OV(V) (85.8%). 123 clauses showed a SOV pattern (156)a) and two clauses appeared in SOVV order (156)b).

(156) [DGS]

a. POSS₁ GRANDPA MANY BIG GIFT₊₊ CARRY_{CL}++

‘My grandpa carries many big gifts.’

b. POSS₁ DAUGHTER LETTER OPEN_{CL} g-pu OPEN_{CL} g-pu

‘My daughter opens the letter.’

7.1% of clauses with handling verbs appeared in SVO order as in (157).

(157) POSS₁ PARENTS DIG-OUT_{CL}++ OLD BUSHES [DGS]

‘My parents dig out old bushes.’

All other attested orders with handling verbs occurred only randomly. Two clauses (1.3%) had a SV order as in (158)a) and in three clauses handling verbs were used with OSV order (1.9%) as in (158)b).

(158) [DGS]

a. EVENING MOTHER IX_{loc} CLOSE_{CL}

‘In the evening, the mother closes (the door) downstairs.’

b. ht-left ht-right
LATER NOTE++ IX₁ THROW_{CL}

‘Later, I throw the notes away.’

(S)VOV as in (159) was attested in three clauses (1.9%).

(159) MOTHER IX_{loc} CLOSE_{CL} DOOR CLOSE_{CL} [DGS]

‘The mother closes the door downstairs.’

Eight clauses with an omitted subject argument resulting in an OV pattern were identified as shown in (160)a). However, clauses showing a VO pattern were not found in the data. Three clauses occurred with a single verb as in (160)b).

- (160) [DGS]
- a. THEN NOTE++ THROW_{CL}
‘Then, (we) throw the notes away.’
- b. (POSS₁ PARTNER CAKE TAKE) EAT
‘(He) eats (the cake).’

Table 16: Subject drop with handling verbs

	1. person	3. person
OV	7	1
VOV		1
V		3

5.6.9 Effect of object animacy and reversibility on word order

This section reports on orders used with animate or inanimate objects. However, those cases were excluded, which involved two realized objects (a direct and indirect object) and only those clauses were considered that had one realized object argument. 175 clauses with only one animate object were identified. Figure 40 illustrates the realized orders.

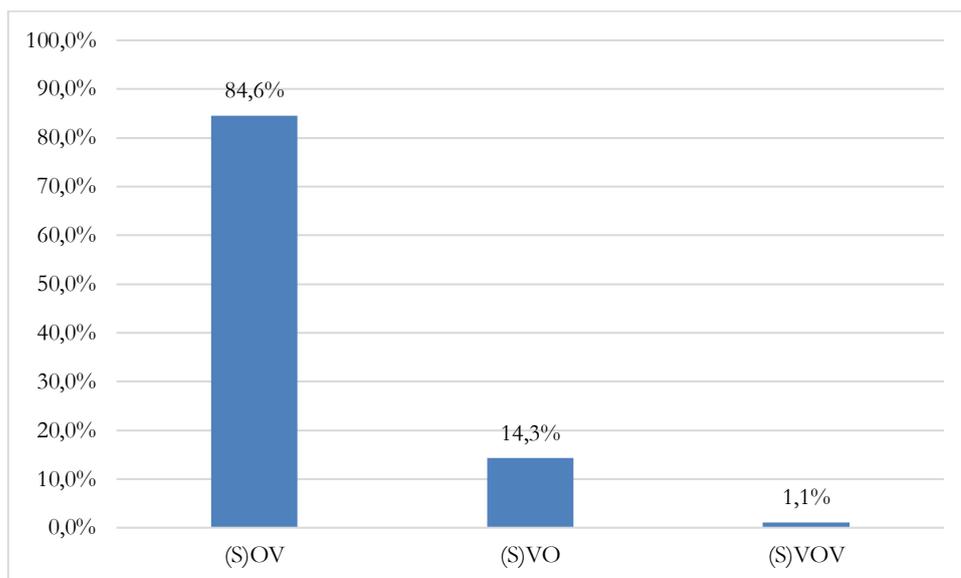


Figure 40: Word order with animate objects

The results clearly show that the majority of clauses with animate objects was realized with (S)OV order (84.6%). Only 14.3% of clauses with animate objects showed a (S)VO pattern. Two clauses were identified that used a (S)VOV pattern.

In contrast, 385 clauses were used with only one inanimate object argument. The results are presented in figure 41.

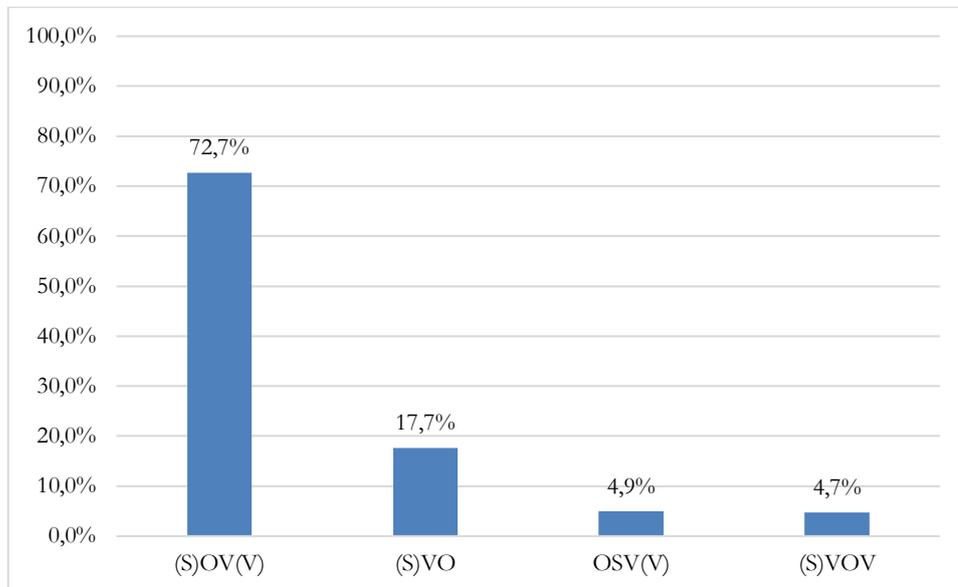


Figure 41: Word order with inanimate objects

Clauses with inanimate objects were most frequently used with (S)OV(V) order (72.7%). They were less common realized with (S)VO order (17.7%) and a few instances were found that showed an OSV(V) order (4.9%) or (S)VOV order (4.7%).

Animacy of the arguments is strongly connected with the effect of reversibility. A situation will be reversible, if a clause involves a plain verb as well as an animate subject and object argument. In this case, both arguments could be interpreted as the agent of the clause. In my data two clauses were found that involve plain verbs and animate arguments. Those were realized with SOV order as presented in (161). Interestingly, example (161)b is an instance of argument extension where PAM is used to add a beneficiary argument.

(161)

[DGS]

- a. BEFORE THREE MONTH IX_{1pl} PASTOR GET-TO-KNOW

‘Three month ago, we got to know the pastor.’

- b. TEACHER PERSON PAM_{3a} STUDENT_{3a} REPEAT

‘The teacher repeats (the topic) for the students.’

80 clauses with plain verbs displayed a non-reversible situation with an animate subject argument and an inanimate object argument. The orders realized in non-reversible situations are shown in figure 42. Two third of the clauses used a SOV order (65%), whereas one third of clauses was realized with a SVO order (33.8%). SVOV order was found in 1.3% of cases.

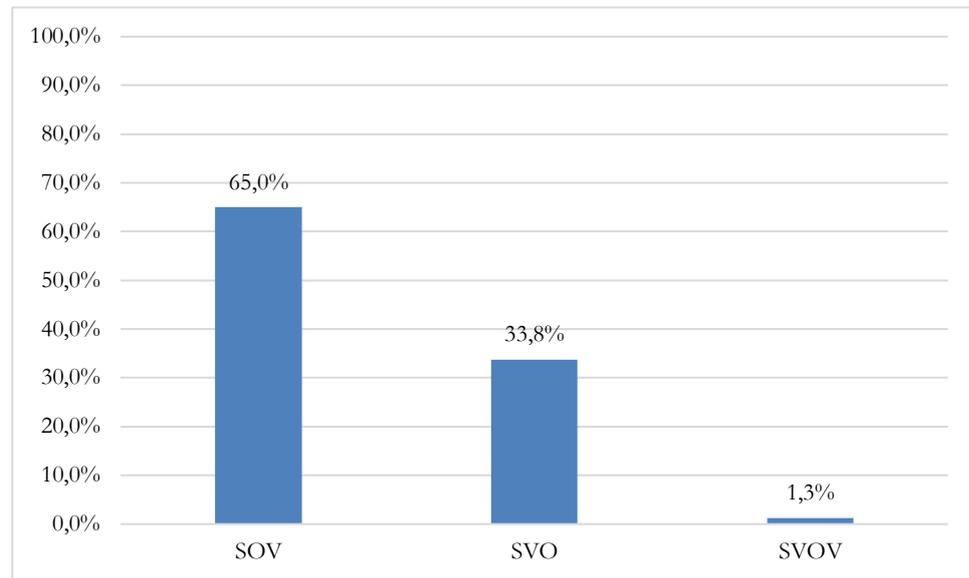


Figure 42: Word order in non-reversible situations

5.7 Summary

Chapter 5 presented the empirical investigation of basic word order and its interaction with verb type in DGS.

First of all, I summarized some critical methodological points raised on a typological orientated approach to word order research and elaborated on the (dis)advantages of empirical methods used for word order research in spoken and sign languages in general (section 5.1). Moreover, I provided an overview of studies investigating word order variation in sign languages and discussed the impact of research design and method on the study of word order. In general, research in sign languages works primarily with three different methods: grammatical judgments, picture description tasks and natural discourse/corpus data. Each of these methods has its benefits and drawbacks. While the picture description task initially used by Volterra et al. (1984) was widely replicated, recent studies mainly used natural corpus data for investigating word order. However, different terminologies and varying definitions of arguments and clause-hood as well as inconsistent transcription systems make it difficult to compare studies on word order cross-linguistically.

22 native or near-native signers of DGS took part in the study whose metadata were summarized in section 5.2. The effect of verb type on word order in DGS was tested by using the method of a Sentence Reproduction Task (SRT) (Hauser et al. 2008; Pendzich et al. 2022; Pendzich, Herrmann & Steinbach 2019). In the current SRT participants had to memorize and reproduce a critical sentence which was manipulated according to verb position (verb-final or non-verb-final) and according to verb type (plain, forward and backward agreement, spatial and handling verbs). In section 5.3, I described the structure of the SRT and the material used for testing verb type influences in detail. The SRT was presented within an online questionnaire programmed with OnExp (Onea 2011). In section 5.4, I reported on the structure of the questionnaire and the procedure used while eliciting the data. The data was annotated using the annotation software ELAN (Crasborn & Sloetjes 2008). Data annotation was complicated by challenges in defining clause and sentence boundaries, simultaneous occurrences of signs and problems in distinguishing nouns and verbs. For data analysis, re-labeling and simplifying of annotations was necessary which was described in section 5.5. In section 5.6 and following subsections, I presented the results of the frequency analysis. The main outcomes are the following:

- In DGS, subject and object arguments can be omitted and verbs can be doubled resulting in various orders found in the data. Nevertheless, (S)OV(V) was the most frequent word order followed by (S)VO and SV(V) order.
- The vast majority of sentences presented in a verb-final order in the stimulus clauses was realized with a verb-final structure. The stimuli presented with a non-final verb, however, resulted in a greater number of sentences realized with a (S)VO order.
- Plain intransitive verbs were realized as SV(V) order and the majority of plain transitive verbs were used with a (S)OV order. However, 16.2% of transitive plain verbs were realized as (S)VO order.
- 74.9% of clauses with a forward agreement verb occurred in a (S)OV order and the majority of them showed a verb modification for person or number agreement. In contrast, 15.6% of clauses were realized with a (S)VO order. Verb modification of forward agreement verbs decreases with clauses realized as SVO order. Out of the verbs realized with (S)VO order, 57.7% showed a verb modification and 42.3% did not.
- Similar to the observations made for forward agreement verbs, backward agreement verbs were mainly used with SOV order (77.9%), while 17.8% appeared with a (S)VO structure. Regarding verb modification of backward agreement verbs, they showed

less agreement marking compared to forward agreement verbs. Almost half of the clauses realized as SOV exhibited no verb modification. Out of the clauses realized with a (S)VO order, none of the verbs was marked for agreement purposes.

- The agreement marker PAM was found in 66 clauses. It was mainly used with SOV order and placed before the (in)direct object. Furthermore, mainly modified agreement verbs occurred with PAM.
- Clauses with spatial verbs showed the most variation concerning order. Two third of the clauses involving a spatial verb were realized as (S)OV(V) (65.3%). The second most common word order was OSV (12.9%) followed by SVOV (8.1%) and (S)VO (5.6%) as the third most common word orders.
- Word order observed with handling verbs was mainly SOV (85.8%).
- Arguments were frequently omitted in DGS. Subject drop was possible with all verb types but occurred rarely with backward agreement verbs. Argument omission interacted with word order since subject drop was less observed with VO order. The most common clauses consisted of a single verb sign. Interestingly, backward verbs used with SOV order and handling verbs used with SVO order did not show subject omission.
- Word order was predominantly (S)OV regardless of the animacy of the object. While 84.6% of clauses with animate objects and 72.7% of clauses with inanimate objects had (S)OV order, 14.3% of animate objects and 17.7% of inanimate objects occurred with (S)VO order.

6 Discussion of results

In general, the data presented in chapter 5.6 reflects what is known from previous research on DGS and shows similar results as observed in other sign languages. Although data was elicited in a controlled study, various orders were observed due to the fact that DGS, like other sign languages such as RSL (Kimmelman 2012), allows for argument omission and verb doubling. The most frequent word order found in the DGS data presented here is SOV as previously claimed by the DGS literature (Bross 2020a; Bross & Hole 2017; Happ & Vorköper 2006; Herrmann & Steinbach 2013; Pfau & Glück 2000).

In this chapter, I will elaborate on the outcome of the presented data and will discuss how the results fit to previous analyses suggested for sign languages. In 6.1, I will look at the input orders given in the stimulus sentences and will see whether and how they influence the output orders realized by the participants. In 6.2, I will discuss the position of the subject and in 6.3 the position of the object. In particular, I will elaborate on the object position regarding the investigated verb types. In section 6.4, I will describe what the results imply for agreement marking and the realization of PAM in DGS and in section 6.5, I will discuss argument drop patterns. In section 6.6, I will look at other issues such as verb doubling, animacy and reversibility.

6.1 Input order vs. output order

The participants realized the majority of clauses (77.2%) presented with a verb-final order in the stimulus prompt as a SOV structure. This is not surprising since it is in line with the literature on DGS that claims that the basic word order in DGS is SOV (Bross 2020a; Bross & Hole 2017; Happ & Vorköper 2006; Herrmann & Steinbach 2013; Pfau & Glück 2000). However, this observation has not been based on a broad empirical basis.

In 19 clauses (5.1%), the SOV order used in the stimuli sentences changed into a SVO order. Based on research on word order in sign languages described in section 3.1.2.2, it was hypothesized that plain verbs should be more flexible concerning word order and should either occur with SOV or SVO structures. However, in the current dataset mainly clauses with agreement verbs were altered into a SVO structure and not plain verbs as expected. The fact that mainly structures including agreement verbs were affected contradicts the idea that subject and object arguments have to be previously established in the signing space in order to change the path movement and/or the finger orientation of the verb to realize agreement with these arguments (Napoli & Sutton-Spence 2014).

Out of these 13 clauses with agreement verbs that changed from SOV into SVO order, eight clauses do not show a verb modification in order to realize agreement. It could be argued that whenever the verb lacks a modification, the order changes into SVO to separate both arguments from each other and to make clear which argument behaves as the subject and the object of the clause. However, five clauses as in (162) were found that show SVO order and an additional agreement modification.

- (162) [DGS]
- bl-b, sq
- a. POSS₁++ FRIEND_{3a} IX_{1pl} 1GIVE_{3a} g-pu TRIP
 ‘My friend, we give (her) a (birthday) trip (together).’
- b. IX_{3a} TEACHER TEACH_{3bpl} IMPORTANT
 ‘The teacher teaches (them all) important (stuff).’
- sq
- c. POSS_{3bpl} FRIEND_{3b} TOGETHER IX_{1pl} 1GIVE_{3b} TRIP
 ‘Our friend, we give (her) a (birthday) trip together.’
- d. TEACHER TEACH_{3bpl}++ STUDENT PERSON++ AGAIN TOPIC
 ‘The teacher teaches each of the students the topic again.’
- e. POSS₁ MOTHER HELP_{3b} POSS_{3b} MOTHER FATHER g-pu
 ‘My mother helps her mother and father.’

Two points arose when looking at these examples. Firstly, three of the clauses (162)a), (162)b) and (162)e), were signed by one participant (participant 22; see section 5.2 for the participants’ metadata). The order is probably influenced by personal style or by language contact with spoken German or further sign languages since the participant is also fluent in ASL and knows other sign languages well. Secondly, two clauses involve a topicalized indirect object indicated by accompanying non-manuals such as squint and body-leans which are usually used as topic markers in DGS (Herrmann 2015). Since agreement with ditransitive verbs targets the indirect object and the indirect object has been moved from its canonical clause position, an additional agreement modification may be used in these cases to make sure the verb refers to the indirect object.

From the stimuli presented with a non-final verb, 59.6% were nonetheless changed into a (S)OV(V) order giving further evidence for SOV as the basic word order in DGS. Still, 21.3% of the stimuli presented with a non-final verb were realized as (S)V(O). On the one hand, it can be argued that methodological issues might have played a role and that participants just copied the presented sentences. On the other hand, the sentences that stayed in the presented SVO order showed a similar pattern as the SOV sentences that changed into a SVO order; namely, both involved agreement verbs. Out of 80 clauses, 43 clauses involved a forward or backward agreement verb. Most of them (33 clauses) do not show agreement modification and the verb interferes between both arguments to indicate the first argument as the subject. Only few clauses with SVO order showed verb modification as illustrated below in (163).

- (163) [DGS]
- a. MOTHER OFTEN INFORM_{3a}++ CHILD_{3a}++
‘The mother often informs the children.’
 - b. IX_{3a} MOTHER INFORM_{3b} OFTEN IX_{3b} CHILD++
‘The mother often informs the children.’
 - c. IX_{3a} BOY _{3a}TEASES_{3b} POSS_{3a} SISTER_{3b}
‘The boy teases his sister.’
 - d. POSS₁ FATHER_{3b} _{3b}SHOW_{3a} POSS₁ GRANDMOTHER_{3a} GARDEN
‘My father shows my grandmother the garden.’
 - e. IX_{3a} TEACHER AGAIN _{3a}EXPLAIN_{3b} STUDY#PERSON_{3b}++
‘The teacher explains (it) to the students again.’
 - f. IX_{1pl} ₁GIVE_{3b} TOGETHER TRIP
‘We give (her) a trip together.’
 - g. POSS₁ FATHER_{3a} _{3a}SHOW_{3b} GRANDMOTHER_{3b} GARDEN
‘My father shows grandmother the garden.’
 - h. POSS₁ MOTHER_{3a} _{3a}HELP_{3b} GRANDMOTHER_{3b} GRANDFATHER_{3b}
‘My mother helps (my) grandparents.’

Examples (163)c), (163)d) and (163)e) were signed by the same participant as the other SVO clauses shown above (participant 22). Hence, language contact or personal style might be relevant here as well, in such a way that this participant seems to favor SVO order in those contexts.

6.2 Subject position

In general, it was found that subjects precede verbs in almost all cases of the data. It is a common and well-studied observation that subjects occur before objects and that sentence initial argument NPs are usually interpreted as subjects. This phenomenon is also demonstrated in sign languages in particular for ÖGS (Krebs 2017; Krebs et al. 2018; Krebs et al. 2019). Furthermore, gesture studies showed that subjects/agents are usually placed in initial position (see section 4.2.1).

Only three clauses were observed that yielded a VS structure shown below in (164).

- (164) [DGS]
- a. TOMORROW COME ONE PASTOR PLUS...?
‘Tomorrow, one pastor came and...’
 - b. ...BROWN BASE g-hands-wave-off
‘...(and) the base is brown.’
 - c. ...PLUS BE-THERE FRIENDS
‘...and friends are there.’

In clauses with VS order, a different prosodic structure was expected but accompanying non-manuals such as eye blinks, head nods or pauses were not observed. Instead, all clauses were part of a coordinated structure. DGS usually does not use conjunctions and clauses are mainly juxtaposed (Happ & Vorköper 2006; Herrmann & Steinbach 2013; Papaspyrou et al. 2008). Interestingly, two of the above-mentioned clauses involved the sign PLUS ‘and’, which is a sign borrowed from the manually coded language LBG (*Lautsprachbegleitendes Gebärden*). The use and structure of LBG signs directly reflect the grammar and syntax of the corresponding spoken language German. Hence, it seems that the constructions shown in (164)a) and (164)c) might be influenced by the structure of spoken German. Another point that deserves further investigation is whether DGS allows for word order asymmetries in coordinated structures as observed in NGT (Legeland, Hartmann & Pfau 2018). In NGT,

word order might differ between both conjuncts and the authors ascribe it to information structural reasons (see section 3.1.2.2).

6.3 Object position

In the following subsections, I will discuss the object positions found in the data and their interaction regarding verb type. As previously described in section 3.2.2, verb type classification is a controversial issue in sign language research and different proposals have been put forward in the last years. The verb types distinguished in this dissertation are mainly defined based on morphosyntactic criteria and are grounded on the classical analysis by Padden (1988). In particular, plain verbs are defined as showing no agreement marking, forward and backward agreement verbs are defined as showing agreement with the grammatical subject and/or object and spatial verbs are defined as showing agreement with spatial locations. Furthermore, verbs involving handling classifier handshapes that do not belong to the group of spatial verbs were considered separately in this dissertation.

Another way of classifying verbs in DGS was recently proposed by , . She defines verb types in DGS based on their place of articulation, their semantic properties and the role of iconicity, i.e. the resemblance between linguistic form and meaning, which is involved in their lexical form and in their morphosyntactic behavior. She distinguishes three types of verbs (Oomen 2020: 284):

- (i) body-anchored verbs: (plain) verbs that are articulated on or close to the signer's body
- (ii) neutral verbs: (plain) verbs that are signed in the neutral signing space and lack a path movement
- (iii) agreeing verbs: verbs that are articulated in the signing space and whose path movement can be modified in order to align with two locations in it
 - a. regular agreeing verbs: verbs that agree with persons/referents
 - b. spatial verbs: verbs that agree with locations

In the following, I will come back to Oomen's suggestion and compare my data with the results described by her and I will discuss whether such an alternative distinction is indeed plausible for DGS. In particular, I will focus on the interaction of verb type and object position.

6.3.1 Plain verbs

The most frequently observed word order with intransitive plain verbs in my dataset is SV (41.3%). The clauses with transitive plain verbs were realized as (S)OV (31.8%) and as (S)VO (16.2%). The other 10.1% were clauses consisting of just a single verb. It was expected that plain verbs show more flexibility regarding their position in a clause because their phonological form does not change in order to agree with arguments in the clause. Typological research on other sign languages (Napoli & Sutton-Spence 2014) found that verbs whose phonological form depends on syntactic or spatial arguments within a clause are usually placed clause-finally. In order to change path movement, form and orientation of finger/hands correctly, the arguments have to precede the verb. Although the expected flexibility is somehow reflected in the DGS data, there is nevertheless the tendency for SOV.

It is often reported that the order of arguments in a clause depends on the semantic reversible character of the situation. A situation will be reversible if a clause involves plain verbs and two animate arguments, subsequently both arguments could be interpreted as either the semantic agent or patient of the clause. To avoid such an ambiguity, reversible clauses use a SVO order to mark the first argument as the agent of that clause. In all clauses with plain verbs that were realized as SVO in my data, the object was inanimate and the situation was non-reversible. Thus, this claim is not reflected in my data.

Instead, it seems that the verbs' place of articulation and iconic properties matter. The SVO sentences with plain verbs found in my data mainly involved body-anchored plain verbs. Those verbs are either directly signed on the body or closely to it. Meir et al. (2007) argue that there is an iconic form-to-meaning correspondence such that the body represents the subject argument in those verbs. Inspired by their proposal, Oomen (2020) claims that body-anchored verbs show an iconically motivated body-to-body mapping. A verb such as LOOK-FOR, for instance, directly represents the eyes, which are involved in the perception event. Oomen further observes that body-anchored verbs behave differently regarding word order. Body-anchored verbs strongly favor postverbal objects (VO order) in her data. In my dataset, 29 clauses involving plain verbs showed (S)VO order. Nine clauses out of these involved neutral plain verbs (REPEAT, CHOOSE, CELEBRATE) and 20 clauses involved body-anchored verbs (LIKE, LOVE, LOOK-FOR, BUY, WRITE and WAIT). Hence, my data reflects Oomen's claims and points towards a separate treatment of body-anchored verbs since they appear in different clause structures than neutral plain verbs.

Another line of argumentation is found in Bross (2020a). He argues that SVO is often found with volitional verbs (e.g. LIKE) such as in clauses like (165)a (Bross 2020a: 83). Furthermore,

he shows that other volitional markers such as WISH in (165)b) (Bross 2020a: 231) appear to the left of the verb.

- (165) [DGS]
- a. MARJOLAINE LIKE BEER
‘Marjolaine likes beer.’
- b. PAUL WISH BEER DRINK
‘Paul wants to drink a beer.’

6.3.2 Forward and backward agreement verbs

As expected, forward agreement and backward agreement verbs occurred most frequently with a (S)OV order. Similar findings were reported for other sign languages since agreement verbs tend to appear in sentence-final position cross-linguistically. Subsequently, Napoli & Sutton-Spence (2014) draw the generalization that verbs whose phonological form depends on the arguments in the clause had to follow their arguments. Contrariwise, I observed that 15.6% of forward agreement verbs and 17.8% of backward agreement verbs occurred with (S)VO order in my data. Interestingly, forward agreement verbs were not consistently modified when used with (S)VO order so that agreement marking decreases. Backward agreement verbs were not modified at all when they appeared with SVO order. Hence, unmodified forward and backward agreement verbs behave like (body-anchored) plain verbs in those cases. Therefore, it suggests that there is an interaction between word order, verb type and verb modification which I will discuss in detail in section 6.4.1.

6.3.3 Spatial verbs

Two third of the clauses with a spatial verb were realized as a verb-final clause, either as SOV, OV or SOVV. Besides that, spatial verbs involve classifier handshapes, which refer to formal and semantic properties of the object they denote, while the movement of the hand expresses the object’s movement and location. Cross-linguistically, classifier predicates are reported as being positioned clause or sentence-finally (Bjerva & Börstell 2016; Hendriks 2008; Pavlič 2016a; Sze 2003). Thus, the results fit to these observations.

OSV(V) was the second most common word order used with spatial verbs, which often occurred in locative constructions. Locative sentences display a spatial arrangement between two entities whose order is determined by semantic properties such as size, mobility and animacy of the entities. Usually, locative constructions in sign languages are analyzed as

reflecting a ground-figure-predicate relation which is based on the idea of Gestalt psychology (Wagemans et al. 2012). The bigger, immobile and usually inanimate entity situated in the background is called the ground and the smaller, mobile and animate entity is called the figure. Many sign languages show similarities in expressing spatial expressions by positioning grounds before figures and by using (simultaneous) classifier constructions for localizing referents in space (Özyürek, Zwitserlood & Perniss 2010). In the literature on word order in sign languages, grounds are considered as objects and figures as subjects resulting in an OSV order found in locative constructions (Kimmelman 2012; Pavlič 2016b). This order is usually analyzed as being driven by the visual-spatial modality and caused by the fact that signers make iconic use of space.

Pavlič (2016a; 2016b) observes that grounds are usually topics of the clause which are non-manually marked by raised eyebrows and followed by a prosodic break and an eye blink. According to my data, all clauses (except one) displaying an OSV structure are also non-manually marked. However, the non-manual marking is very subtle and the non-manuals are not used consistently by all signers. Among the non-manuals, which occurred with OSV order and which accompanied the object, I noticed head tilts (sideward, backward or forward), head nods, squint, blinks, or eyebrow raise as illustrated in figure 43 - figure 46.



Figure 43: OSV structure marked with squint and head tilt backward



Figure 44: OSV structure marked with raised eyebrows



Figure 45: OSV structure marked with head nod followed by a head tilt backward



Figure 46: OSV structure marked with a blink

In sign language research two different views arose regarding non-manuals and their analysis in recent years. While one group of researchers regards non-manuals as directly linked to syntactic structures (see also section 4.2.3), another group of researchers argues that non-manuals are prosodic in their nature as well as in their distribution and that they convey pragmatic information compositionally (see Sandler (2010) for a comparison of both perspectives). Dachkovsky & Sandler (2009), for instance, argue that facial expressions are intonational markers and that brow raise is comparable to H tones in spoken languages. Brow raise serves as marking continuation and dependency between two structures, whereas squint “instructs the addressee to retrieve information that is not readily accessible” (Dachkovsky & Sandler 2009: 287). Besides the general semantic representation each of the facial non-manual markers represents, they can be simultaneously combined resulting in a complex meaning. Dachkovsky & Sandler argue that the nuances of information structure found in topic constructions are marked by squint and brow raise. Brow raise signals a dependency between the topic and the comment and squint can be associated with less accessible topics. For DGS, Herrmann (2015) showed that the function of squint is similar to what has been described for ISL. Squint instructs “the addressee to search for and access low accessibility information in the common ground” (Herrmann 2015: 290) and thus, marks given information in the discourse. Similarly, Bross (2020a) assumes that the ground-figure order (OSV) is more natural if the ground was previously introduced in the context. If the ground is new, signers will prefer a figure-ground (SOV) order. In Bross (2020c), he further shows that frame-setting topics such as locative frames are non-manually marked by lowered eyebrows and dense eyes. Hence, it seems plausible for me to draw a connection between the often-observed ground-figure structure and information structure or context dependency. In the identified OSV clauses in my data, the ground was given information and previously known from the context. In (166) the locative object GARDEN was previously mentioned in the context. Subsequently, the object is non-manually marked by squint that spreads over the whole constituent and is further marked by a head nod occurring at the final edge of it. Four out of the produced 16 OSV(V) clauses involved squint marking; thus, making this interaction an interesting point for further investigation.

(166) [DGS]

Context: Last month my father got a new job offer. Hence, my parents moved to a different city. We bought a new house there. We have renovated the house for a long time. Now, we lay out the garden.

_____ sq, hn

Answer: IX_{loc} GARDEN LATER POSS₁ FAMILY SIT

‘In the garden, later, my family sits (together.)’

Based on previous descriptions of DGS (Happ & Vorköper 2006), it was expected that the ground-figure-predicate (OSV) order is a frequently applied strategy in DGS. However, methodological reasons might explain why OSV did not occur as often as expected. Firstly, all clauses (except one) involving spatial verbs and OSV order had OSV as input order in the stimulus sentences. Secondly, the coding decisions explained in section 5.5 lead to less coded OSV structures. Specifically, in clauses with two objects (for instance a direct and a locative object) resulting in an OlocSOdirV order, the locative object was neglected and thus, coded as SOV order. Thirdly, Kimmelman (2012) observed an interaction of spatial use and research methodology which he defined as a spatial or syntactic strategy. In free conversations or during picture description tasks, signers use space more extensively, locate referents in space and make use of simultaneous constructions (spatial strategy). In contrast, other methods are associated with a limited use of space and less use of simultaneous constructions (syntactic strategy). It might be the case that the SRT method led signers to favor a syntactic use of space which could explain less observed figure-ground relations and less simultaneous constructions.

All other orders occurred only marginally. Only seven clauses out of 124 were found in the data that showed a (S)VO structure. It is remarkable that five of them involved the verb GO and a pronominal subject form instead of a full noun-phrase subject (167). One might speculate whether pronominal forms behave differently regarding word order in DGS than full NP arguments, however, more data is needed to fully disclose this.

(167) IX_{1pl} GO_{Cl}. BOSS POSS OFFICE [DGS]

‘We go to the boss’s office.’

Additionally, I want to comment on the one exceptional clause found with an OVS structure that occurred with the spatial verb LIFT. The example is repeated here as (168).

ht-b

(168) HEAVY SUITCASE LIFT_{CL} FATHER IX_{loc} CAR LIFT_{CL} [DGS]
 ‘The man lifts heavy suitcases into the car.’

I noticed a subtle head tilt backwards spreading over the OV part of the clause. Hence, it could be argued that it is an SVOV structure and the OV constituent was fronted. SVOV was found in ten clauses and as such, is not that exceptional.

Finally, Oomen (2020) finds a difference between locative objects and direct objects regarding their position in clauses, which is another interesting line of argumentation. With reference to spatial verbs, she observed that direct objects prefer a preverbal position (OdirV), whereas locative objects are more flexible and occur in pre- (OlocV) and postverbal positions (VOloc). My data demonstrates a strong preference for preverbal objects, both for direct and locative objects used with spatial verbs. However, eleven clauses (out of 124) were found that involve a locative object following a verb. However, the few cases with (S)VO order in my data all involved a locative object. Hence, more data is required to investigate whether locative objects occupy a different position in the clause as opposed to direct objects.

6.3.4 Handling verbs

The vast majority of clauses with handling verbs appeared in SOV order (85.8%). Handling verbs, as well as spatial verbs, involve classifier handshapes, which are usually positioned sentence-finally. In order to choose the respective handshape, the manipulated/referring object has to be mentioned before. However, the classification of handling verbs in my data is worth to be discussed.

Classifier predicates are well studied across different sign languages and denote animate or inanimate entities. The handshape depicts a formal or semantic characteristic of the referred object and movement and location of the hand resemble the movement and location of the denoted object. In sign language literature, different terms and classification of classifier predicates exist (see Zwitserlood (2012) for an overview). Usually, whole-entity classifiers are distinguished from body-part and handling classifiers. Whole-entity classifiers denote the object as a whole, body-part classifiers represent parts of the body and handling classifiers refer to the handling or manipulation of the object. In an influential paper, Benedicto & Brentari (2004) offer a syntactic account of classifier predicates and their relation to argument structure. Based on various proposed syntactic tests, they argue that whole-entity classifiers are intransitive with an internal argument, body-part classifiers are intransitive with an

external argument and handling classifiers are transitive verbs involving an internal and an external argument. For DGS, Glück & Pfau (1998) also show that whole-entity classifiers are intransitive, while handling classifiers are transitive. Furthermore, classifier predicates are less lexicalized as lexical predicates; thus, they are not assigned a lexical meaning but are often glossed more generally as MOVE or BE_AT. Variations of movement and location of these predicates lead to different compositional attributed meanings such as *jump* or *put on*. Kimmelman (2018b) raises the point saying that it is sometimes difficult to decide whether a predicate is a classifier predicate with an underspecified meaning or whether parts of the predicate are lexicalized and thus, receive a specific meaning (see also Johnston & Schembri (1999)).

The verbs called handling verbs in this dissertation have similarities with handling classifiers since they involve the handling or manipulation of an object. They are also transitive and involve an agent argument. Among the investigated handling verbs, the verbs DIG-OUT, WEAR, CARRY, THROW, CLOSE and OPEN involve a handshape that is manipulated according to the referred object as shown in figure 47 - figure 52 below.



Figure 47: Classifier handshape used with DIG-OUT



Figure 48: Classifier handshape used with WEAR



Figure 49: Classifier handshape used with CARRY



Figure 50: Classifier handshape used with THROW



Figure 51: Classifier handshape used with CLOSE



Figure 52: Classifier handshape used with OPEN



Figure 53: Neutral handshape used with EAT



Figure 54: Neutral handshape used with POUR

However, EAT (figure 53) and POUR (figure 54) did not occur with manipulated handshapes and thus, could be classified as lexicalized (plain) verbs. Oomen (2018; 2020), for instance, analyzed EAT as a body-anchored verb and POUR as a neutral (plain) verb in DGS. If classified as plain verbs, they should behave more flexible regarding the position of the object and if articulated on or near the body such as EAT, favor VO order. Out of the eleven clauses that appeared in SVO order, only one clause involved EAT and another clause contained POUR; thus, this tendency is not reflected in my data. Hence, they behaved more like handling verbs, which prefer a verb-final order and not as (body-anchored) plain verbs. This might indicate that those verbs have not been lexicalized. Furthermore, EAT, for instance, can occur with manipulated handshapes in some contexts. However, it is remarkable that SOV, in general, is strongly favored within the whole group of handling verbs.

Another interesting point is that all handling verbs refer to extensional events. The gesture study by Schouwstra & de Swaart (2014) shows that extensional events, specifically events that involve concrete and manipulated objects whose existence is presupposed, have a preference for SOV order. Napoli, Sutton-Spence & de Quadros (2017) replicated the study for Libras and found that extensional verbs tend to follow the object, while intensional verbs tend to precede the object (see section 4.2.1.4). The extensional verbs they investigated comprised the verbs *swing*, *throw*, *climb*, *eat*, *carry*, *drop*, *paint*, *hang* (on a washing line), *cut* (with scissors) and *slice* (with knife or pizza wheel). All these verbs typically occur with a handling

classifier. The verbs *swing*, *throw*, *carry*, *drop* and *hang* involve a person that moves an object. Furthermore, *climb* is realized as a handling classifier since the hands curl to grasp something, while the verbs *eat*, *cut*, *slice* and *paint* involve an affected object. Napoli, Sutton-Spence & de Quadros argue that the iconic factors of the visual modality (may it be sign language or gesture communication) determine the choice of OV and VO order and that semantic factors can interfere with the basic word order of a language. It is an interesting point for further studies to investigate whether SOV order in classifier constructions is an effect of the use of a classifier handshape or whether the semantic character of the event causes it.

6.4 Agreement

In this section, I will discuss whether agreement marking has an impact on word order in DGS. In 6.4.1, I will look at verb modification and will show that it is connected to word order. Additionally, I will discuss the position and use of PAM in section 6.4.2.

6.4.1 Verb modification

In sign language literature on word order, it is well known that the presence of an agreement verb can affect clause structure (de Quadros 1999; Kegl 2004; Kimmelman 2012; Milković, Bradarić-Jončić & Wilbur 2006; Oomen 2020; Rutkowski & Łozińska 2016). In my data, I observed that clause structure is not only determined by the presence of an agreement verb but also determined by the fact whether the verb is modified for agreement purpose or not. 84% of forward agreement verbs used with SOV showed agreement marking, but only 55.9% of the backward verbs used with SOV were marked for agreement purposes. Contrarily, SVO order is connected with a decrease in agreement modification of these verbs. 57.7% of forward agreement verbs used with SVO and none of the backward verbs used in SVO structure showed agreement marking.

Fenlon, Schembri & Cormier (2018) made a similar observation for BSL based on corpus data. They found that verb-final clauses showed more verb modification as compared to non-final verbs and assume that modified verbs might prefer the phrase-final position because they are prosodically heavier. Their conclusion is based on Wilbur (1999) who argues that elements in phrase-final position are prosodically heavy and receive more prominence. A similar observation is made by Crasborn et al. (2012) who observed that modified verbs in clause-final position did not occur with additional pointing signs in NGT. Crasborn et al. conclude that modified verbs are prosodically heavy as such. I find it reasonable to argue that modified agreement verbs are prosodically heavier and are thus, placed clause-finally. If

agreement verbs are not modified, it is more likely that they occur in a clause-internal position. Additionally, the same line of argumentation holds for verbs involving classifier handshapes. They are morphologically complex, show more prosodic weight, and thus, are more likely to be placed clause-finally. However, it does not explain why plain verbs frequently occur clause-finally in DGS since they are commonly considered as morphologic and prosodic simple signs.

In general, research on agreement marking in sign languages has revealed several factors that may interact with agreement modification. Firstly, the animacy of the arguments might have an impact since agreement usually targets two animate arguments (Rathmann & Mathur 2002). Secondly, phonological restrictions such as phonological rules of well-formedness or articulatory reasons might block the modification of verbs for particular forms (Mathur & Rathmann 2010; Rathmann & Mathur 2005). Thirdly, agreement modification might increase in clauses with constructed action and with the presence of null arguments in the previous clause (Fenlon, Schembri & Cormier 2018). In particular, the first argument may explain why SVO clauses showed less agreement marking in my data. Rathmann & Mathur (2002) argue that agreement is restricted to animate arguments. Subsequently, a potential ambiguity between the animate subject and the animate (indirect) object (or an ambiguity between the agent and patient/recipient role) emerges in verb-final clauses that show no verb modification. To resolve this ambiguity, SVO order is used to mark the first referent as the subject/agent of the clause. An example for such a potential ambiguity which arises in SOV sentences is found in (169)a) compared to (169)b). (169)b) shows SVO order and a verb which intervenes between both arguments.

- (169) [DGS]
- a. IX MOTHER CHILD++ INFORM
 ‘The mother informs her children.’
- b. IX_{3a} BOY TEASE ALWAYS POSS_{3a} SISTER
 ‘The boy always teases his sister.’

It was previously hypothesized that clauses involving agreement verbs and SVO order use probably other mechanisms to identify referents and to establish agreement. In particular, I assumed such clauses involve the use of PAM, classifiers or specific non-manuals. However, only one clause was identified that involved a forward agreement verb, SVO order and an additional occurrence of PAM. In (170), the verb TEASE is unmodified and PAM realizes agreement with the object. The movement of PAM starts in front of the signer’s chest, is

directed towards the ipsilateral side of the signing space and is followed by the sign SISTER that is signed at the same location as PAM.

(170) IX_{3b} BOY_{3b} ALWAYS TEASE PAM_{3a} SISTER_{3a} [DGS]

‘The boy always teases his sister.’

Furthermore, I did not observe any occurrence of a backward agreement verb used with SVO order and an additional use of PAM. Hence, PAM was not used as an additional agreement mechanism in cases of unmodified agreement verbs and SVO order. Other mechanisms of argument identification were not observed but deserve further investigation in future.

6.4.2 Person agreement marker

Although PAM was not part of the stimulus sentences, 66 clauses were identified that involved an occurrence of PAM. PAM in DGS is relatively well researched (see section 3.2.2 and Bross 2020b; Macht 2016; Macht & Steinbach 2019; Murmann 2012; Pfau, Salzmann & Steinbach 2018; Pfau & Steinbach 2006a; Pfau & Steinbach 2013; Rathmann 2003; Steinbach 2011; Steinbach & Pfau 2007). However, there is a debate concerning the use, position and function of PAM in DGS.

PAM was first introduced by Rathmann (2003) as a person agreement marker. Referring to the use of PAM, Rathmann reports that PAM mainly occurs with plain verbs. If PAM is used with agreement verbs, these verbs will not show agreement modification. Furthermore, PAM is usually used with animate arguments. Murmann (2012) and Murmann et al. (2013) conducted a questionnaire study and made several interesting observations regarding the animacy of arguments and the modification of agreement verbs which co-occur with PAM. Firstly, they showed that PAM is preferred with animate arguments. However, it can co-occur with inanimate arguments that have a strong personal value. Secondly, modified agreement verbs, which co-occur with PAM, were rated worse than modified agreement verbs without PAM. Thirdly, unmodified agreement verbs received better ratings when they occurred with PAM compared to unmodified verbs without PAM. Finally, modified agreement verbs without PAM were still better rated than unmodified agreement verbs with PAM. In line with this argumentation, the use of PAM in my data is related to animacy. Most arguments used with PAM referred to a human entity or an entity with a strong personal value. However, the use of PAM was not restricted to plain verbs since PAM frequently occurred with forward and backward agreement verbs as the examples in (171) show (see also section 5.6.6). According

to Rathmann (2003), agreement verbs co-occurring with PAM should not show agreement modification as (171)a). My data contradicts this claim because the majority of cases showed PAM with a modified agreement verb yielding a kind of double-agreement as in (171)b) and (171)c). Pfau, Salzmann & Steinbach (2018) suggest to analyze cases with modified agreement verbs and PAM as bi-clausal structures (more on this view in section 7.2).

- (171) [DGS]
- a. POSS₁ MOTHER PAM_{3b} POSS₁ GRANDMOTHER GRANDFATHER HELP
 ‘My mother helps my grandparents.’
- b. POSS₁ FATHER_{3b} PAM_{3a} POSS₁ GRANDMOTHER_{3a} GARDEN _{3b}SHOW_{3a}
 ‘My father shows my grandmother the garden.’
- c. IX_{3a} TEACHER_{3a} _{3a}PAM_{3b} STUDY#PERSON++_{3b} AGAIN CONTENT _{3a}EXPLAIN_{3b}
 ‘The teacher explains the content again to the students.’

The position of PAM is either identified as preverbal (following the subject (Rathmann 2003) or preceding the object (Bross 2020b)) or as clause-final (Pfau & Steinbach 2006a; Steinbach & Pfau 2007; Pfau, Salzmann & Steinbach 2018; Macht 2016; Macht & Steinbach 2019). My data shows that PAM mainly occurred in sentence-internal position and that it was either placed before the direct object (171)a) or indirect object as in (171)b) and (171)c). Only four clauses showed a clause-final position of PAM. Furthermore, PAM mainly appeared in clauses with SOV order (90.9%) as shown in the examples (171) (see also section 5.6.6). Macht (2016) and Macht & Steinbach (2019) investigated PAM based on DGS corpus data. They found that PAM occurred clause-final in the majority of cases and that a preverbal realization of PAM was restricted to southern varieties of DGS. However, this observation is not reflected in my data. 18 of 22 of my participants used PAM. Though five of them were raised in Southern Germany and could represent a southern variety of DGS, another group of five participants were raised in West Germany, seven participants in Middle or Northern Germany and finally one participant grew up in East Germany. Interestingly, only three participants used a postverbal PAM and they were raised in East, West and South Germany, respectively. Consequently, it cannot be inferred from my data that the different position of PAM is caused by a regional variation.

The function of PAM is usually regarded syntactically in nature since its main function is to realize agreement with subject and object when co-occurring with plain verbs and realized in clause-final position (see the agreement analysis of Pfau, Salzmann & Steinbach (2018) presented in section 4.4.3). Therefore, PAM is analyzed as an agreement auxiliary which realizes agreement by moving from subject to object locus and by facing the object. A different approach is provided by Bross (2020b). He argues that PAM is a differential object marker and its use is triggered by the animacy, definiteness and affectedness of the direct object. Bross made several observations regarding PAM. Firstly, PAM mainly appeared in clause-internal position preceding the object, which is consistent with my data. Secondly, PAM often cliticized with the object which was characterized by handshape coarticulation and a smooth transition between PAM and the object supporting the idea of a strong connection between PAM and the object. Thirdly, the use of PAM is primarily triggered by the animacy of the object, which is also reflected in my data. Almost every clause (61 out of 66 clauses) with PAM involved an animate argument. In three of these exceptional cases, PAM was used to extend argument structure. The other two clauses involved the plain verbs LOVE and LIKE and an inanimate object argument DOLL (172). But as shown by Murmann (2012), DOLL can be considered an argument which is associated with a strong personal value and it is thus possible to co-occur with PAM. Finally, Bross argues that PAM does not mark agreement with the subject and the object but rather marks agreement only with the object. If agreement realization targets the object (and not the subject), the movement of PAM starts either in the neutral signing space or at the location in space congruent with the previous sign as depicted in figure 55. Figure 55 illustrates the endpoint of the sign FATHER and the beginning of PAM and corresponds to the example (171)b) above. However, I found 10 cases where PAM clearly moves from the subject location to the object location as for instance in example (171)c). In all other 56 attested clauses, PAM moves towards the object location as in (171)a) and (171)b) above and as further demonstrated in (172) below.

(172) PAM_{3b} LIKE POSS_{3b} DOLL

[DGS]

‘(The girl) likes her doll.’



Figure 55: PAM used as a marker for object agreement

Furthermore, Bross claims that the use of PAM causes a definite reading as already described in section 4.4.3. The respective example is repeated here as (173) (Bross 2020b: 20). It is open for further research whether such readings occur obligatorily.

- (173) [DGS]
- a. YESTERDAY PAUL_{3a} POLICE#PERSON_{3b} SEE_{3b}
 ‘Yesterday Paul saw a/the policemen.’
- b. Context: Do you remember the policeman that Paul talked about?
 YESTERDAY PAUL_{3a} PAM_{3b} POLICE#PERSON_{3b} SEE_{3b}
 ‘Yesterday Paul saw the policemen.’

6.5 Argument omission

My data reveals an interesting observation concerning the omission of arguments in connection to verb type and word order. There are different approaches dealing with argument omission in the sign language literature. One approach sees argument omission as licensed by agreement marking in case of agreement verbs or by discourse topics in case of plain verbs (Lillo-Martin 1986b). Contrarily, others have argued that non-manual markers (i.e., head tilt and eye gaze) are instances of agreement marking and that plain verbs allow for argument drop if a non-manual marker is present (Bahan et al. 2000). In line with such an agreement account, classifiers are analyzed as agreement markers and thus, license argument drop (Glück & Pfau 1998; van Gijn & Zwitserlood 2006). In contrast, it has been claimed that argument omission can be analyzed as an ellipsis of a bare NP-argument (Koulidobrova 2017), while others proposed an analysis involving the notion of demonstration (Kimmelman

2018a). Recently, Oomen & Kimmelman (2019) and Oomen (2020) offered a theory of argument drop based on a corpus study of DGS and RSL in line with an agreement approach (see section 4.4.3 for details of their analysis.) In the following, I will compare and discuss my findings with their recently made claims about DGS.

6.5.1 Subject drop

The theory presented in Oomen & Kimmelman (2019) and Oomen (2020) is based on a unified agreement analysis of plain, neutral and agreement verbs. Inspired by the body-as-subject theory of Meir et al. (2007), they assume that body-anchored plain verbs are in an agreement relationship with the subject and show different subject drop patterns compared to the other verb types. According to the authors, body-anchored plain verbs are inherently specified for a speaker-feature. Consequently, omitted subject arguments of body-anchored verbs always refer to first person and thus, allow for first-person subject drop. Contrarily, third-person subjects have a non-inherent referent-feature which would clash with the speaker-feature of the body-anchored verb in case a third-person subject would be omitted. In contrast to body-anchored verbs, neutral and agreeing verbs are not inherently specified for a speaker-feature and can omit first- and third-person subjects.

In my data, first-person and third-person subject drop occurred with plain verbs, forward and backward agreement verbs, spatial verbs and handling verbs. According to the theory by Oomen & Kimmelman, third-person subject drop with body-anchored verbs should be ruled out. However, I found clauses which showed omission of third-person subjects in case of body-anchored plain verbs as illustrated in (174). As I explained in section 5.5, such clauses involving multiple verb occurrences were analyzed as two separate clauses if the verb differed. However, under a different approach, such cases could be analyzed as coordinated structures. (174)a), for instance, could be translated as ‘a little girl sits in the car and cries a lot’. It is a common observation that coordinated structures involve the ellipsis of some elements and as such, omission of a third-person subject is expected.

- (174) [DGS]
- a. [LITTLE GIRL LITTLE CAR SIT_{cl}] CRY++ OFTEN CRY++
 ‘The little girl sits in the car. (She) cries a lot.’
- b. [EXIST ONE GIRL] PAM_{3b} LIKE POSS_{3b} DOLL
 ‘There is one girl. (She) likes her doll.’
- c. [GIRL OFTEN CAR GO-IN_{cl}] CRY
 ‘The girl goes into the car. (She) cries.’
- d. [THEN POSS₁ CHILD++ LIE_{cl}] SLEEP
 ‘Then my children lie (in bed.) (They) sleep.’
- e. [POSS₁ FRIEND OFTEN GO_{cl} WOOD] HIKE
 ‘My friend often goes to the woods. (He/she) hikes (there).’
- f. [AFTER EVENING#FOOD CHILD++ LIE_{cl} BED] SLEEP
 ‘After dinner, (my) children lie in bed. (They) sleep.’

Additionally, I found two cases with an omitted third-person subject that concern the verb EAT. I treat EAT as a handling verb, but Oomen (2020) considers it as a body-anchored plain verb which should not allow for third-person subject drop. Regarding forward and backward agreement verbs, backward verbs showed less subject drop than forward agreement verbs in my data (see section 5.6.4.2 and 5.6.5.2). Forward and backward agreement verbs were not separately distinguished by Oomen, however, different argument drop patterns speak for a separate analysis of both verb types.

Interestingly, I made two observations regarding the interaction of word order and argument omission. On the one hand, I found that handling verbs used with SVO order did not involve subject drop. On the other hand, subject drop did not appear with backward verbs used with SOV order. Referring to handling verbs, in general, SVO order (7.1%) was used marginally. None of these involved an omitted subject argument although classifier predicates are argued as licensing argument omission in DGS (Glück & Pfau 1998). Hence, it was expected that subject drop should be possible with handling verbs regardless of the used order. It would be an interesting question for further research to see how classifier predicates, VO order and argument drop are related. Regarding backward verbs, subject drop was rare compared to

the other verb types. It was not observed with verb-final clauses and with regard to VO order, subject drop occurred only once. This exceptional case might be the result of the coding and annotation decisions. The respective example is illustrated below in (175). I analyzed it as involving two clauses: the first showing a SV order, the second having VO order (175)a). If sentence boundaries had been annotated differently, a SVO order without subject omission would have been the result (175)b).

- (175) [DGS]
- hn
- a. IX_{3a} POSS₁ FRIEND / INVITE POSS₁ EX #PARTNER
 S V V O
 ‘She is my friend. (She) invited my ex-partner.’
- b. IX_{3a} POSS₁ FRIEND INVITE POSS₁ EX# PARTNER
 S V O
 ‘My friend invited my ex-partner.’

In general, it seems that backward agreement verbs do not license subject omission. However, more verbs need to be investigated to account for this observation. Furthermore, it is open for further research how subject drop of backward agreement verbs is connected to word order.

6.5.2 Object drop

Although object drop was not systematically investigated during data annotation, I will briefly comment on the made observations. Oomen (2020) speculates that the same conditions assumed for subject drop with body-anchored plain verbs should also hold for object drop. Since body-anchored verbs are associated with the subject referent, object arguments cannot refer to the signer and are thus interpreted as a non-first-person argument. Hence, omission of a first-person object argument in clauses with body-anchored verbs would lead to ungrammaticality.

In general, I observed that the omission of object arguments occurred less than the omission of subject arguments. Object drop with transitive plain verbs is rarely found in my data. Out of three clauses that showed object omission with plain verbs, only one involved a body-

anchored verb (DISCUSS)²⁶. The omitted object referred to a third-person referent as predicted by Oomen. Furthermore, I observed that object drop is more likely with agreement verbs. Seven clauses were found that involved a forward agreement verb (six of them were modified) and five clauses involved a backward agreement verb (three of them were modified). Furthermore, eight clauses with spatial verbs and five clauses with handling verbs licensed the omission of a third-person object argument. It thus seems that the presence of agreement marking and classifier predicates is crucial in licensing object drop (Glück & Pfau 1998), but further data needs to verify these observations.

6.6 Further factors influencing word order

In the following subsections, I will discuss phenomena which were not initially planned to be investigated but are usually mentioned in the sign language literature on word order. In section 6.6.1, I will report on verb doubling and in section 6.6.2, I will describe and discuss the animacy of the arguments and the reversible character of the situation and their influence on clause structure in DGS.

6.6.1 Verb doubling

Regarding SVOV order the sign language literature distinguishes between verb echoes (Pinsonneault 1994) and verb sandwiches (Fischer & Janis 1990). Verb echoes involve two identical occurrences of the verb. On the other hand, in verb sandwiches the second occurrence of the verb is modified and receives an additional marking like an aspectual, agreement or non-manual marking. My data revealed 21 clauses with SVOV order; 13 can be classified as verb echoes and seven as verb sandwiches. However, Kimmelman (2013) observed that even in identical verb forms, both occurrences may differ in muscle tension and duration of the signs. He found that the second occurrence of the verb is shorter and articulated with less effort in RSL and NGT.

In general, doubling is a common phenomenon in sign languages and different elements such as pointing signs, wh-words or verbs frequently occur twice in a sentence. In literature, the function of doubling is often connected to emphasis or focus marking (Nunes & de Quadros 2008; Petronio 1993). Kimmelman (2013) proposes a pragmatic explanation of doubling in terms of foregrounding and backgrounding. He suggests that the doubled

²⁶ My definition of body-anchored verbs also includes verbs whose place of articulation is specified for a particular region in the signing space, which is close to the body. In the case of DISCUSS, it is signed close to the signer's mouth.

information is foregrounded and the intervening information is backgrounded. Although this might be an interesting line of argumentation and could be further investigated in DGS, I think that methodological reasons might best explain SVOV order in the identified cases. 18 of the identified clauses with SVOV order had SVO as the input order. I assume that in these cases the participants probably remembered the presented structure, but that structure contradicts their preferred verb-final order. Thus, it could be the case that the participants unconsciously inserted a final verb into the SVO structure which then resulted in a SVOV order. If such methodological choices explain SVOV order, it can be seen as further evidence for SOV as the basic word order in DGS.

Other orders that involve two verb occurrences that immediately follow each other such as SVV or SOVV were mostly used for clarifications purposes. For instance, I observed that some signs were repeated using a different variant such as in (176) and illustrated in figure 56. The participant first used a variant of DIE that is articulated on front of the throat, whereas the second sign is performed in the neutral signing space.

(176) LAST YEAR POSS₁ GRANDMOTHER HOSPITAL IX_{loc} DIE DIE [DGS]
 ‘Last year, my grandmother died in the hospital.’



Figure 56: Variants of DIE

6.6.2 Animacy and reversibility

It is a well observed fact that the animacy of both arguments in a clause can have an effect on the arguments' order (Milković, Bradarić-Jončić & Wilbur 2006; Massone & Curiel 2004; Coerts 1994; Volterra et al. 1984; Sevinç & Bozşahin 2016). Animate objects are usually positioned postverbally (VO), while inanimate objects are placed preverbally (OV). In my data, the stimuli were not controlled for object animacy. Consequently, the stimuli involve more inanimate objects (385 clauses with inanimate objects compared to 175 clauses with

animate objects). Nevertheless, an animacy effect as described for other sign languages was not observed in my data. Objects were strongly preverbal regardless of the animacy of the object. 84.6% of animate objects and 72.7% of inanimate objects occurred with (S)OV order. However, this deserves further investigation.

Furthermore, reversible situations often prefer different word orders than non-reversible situations. While reversible situations show a preference for a SVO order, non-reversible situations usually show a SOV order. According to Fischer (2014), basic word order is the order used in reversible sentences. Since the study for this dissertation was not designed to test the effect of reversibility on word order, I can only discuss the two clauses repeated here as 0 that were found to display a reversible situation. Interestingly, these clauses occurred in a SOV order and might be seen as further evidence that DGS has SOV as its basic word order. However, the example in (177)a) involves the verb GET-TO-KNOW which further describes a reciprocal situation. It cannot be ruled out that this reciprocal relationship might influence word order as well. Hence, further data is needed to test the interaction of reversibility and word order in DGS.

- (177) [DGS]
- a. BEFORE THREE MONTH IX_{1pl} PASTOR GET-TO-KNOW
 ‘Three month ago, we got to know the pastor.’
- b. TEACHER PERSON PAM_{3a} STUDENT REPEAT
 ‘The teacher repeats (the topic) for the students.’

6.7 Summary

In chapter 6, I discussed the results of the empirical investigation of verb type influences on word order in DGS. In section 6.1, I looked at the influence of the order used in the stimulus sentences on the order realized in the output sentences. Firstly, SOV input order was mainly realized as SOV output order and secondly, SVO input order clauses were changed predominantly into a SOV order. This gives evidence for SOV order as the basic word order in DGS. Furthermore, it was previously hypothesized that SOV order is strongly connected to agreement and handling classifier verbs, while plain verbs allow for more flexibility and occur with both SOV and SVO orders. Interestingly, the clauses that changed from SOV into SVO order as well as the clauses that stayed in the presented SVO order mainly involved unmodified agreement verbs. I argued that unmodified agreement verb intervene between

both arguments to indicate the first argument as the subject and the second argument as the object. In section 6.2, the position of the subject was elaborated. Subjects preceded verbs and the rare cases, which showed a VS structure, seem to be influenced by the grammar of spoken German. In section 6.3, I discussed the object position based on the investigated verb types. Word order with plain verbs was not as flexible as expected; they mainly appeared with SOV order. However, body-anchored plain verbs showed a preference for (S)VO order which supports the idea to distinguish between body-anchored and neutral plain verbs as suggested by Oomen (2018; 2020). As expected, forward and backward agreement verbs occurred with SOV order. If they otherwise occurred with SVO order, they would show less agreement modification. Various orders were attested with spatial verbs, but SOV was the most common used word order. OSV order can be explained by semantic principles such as the figure-ground relationship. Additionally, information structure interacts with the figure-ground relation since grounds (O) are usually known from the context and are marked by squints. However, OSV order occurred less than expected which might have methodological reasons. Spatial verbs, which appeared in SVO order, involved pronominal forms instead of full noun phrases, which deserves further investigation. Regarding handling classifier verbs, SOV was strongly favored. On the one hand, this might be connected to the use of classifier handshapes. In order to select the respective handshape, the object which the handshape refers to needs to be placed before the verb resulting in an OV order. On the other hand, clauses with handling classifiers refer to extensional events that have a preference for verb-final clauses. In section 6.4, I discussed the interaction of word order and verb agreement. Clauses involving forward agreement verbs used with SOV order show agreement marking in 84% of cases. In clauses involving backward agreement verbs, half of the clauses with SOV order (55.9%) had a modified verb. Agreement marking decreases when verbs are used in SVO order. I argued that in verb-final clauses with unmodified agreement verbs a potential ambiguity arises since both animate arguments might be interpreted as the agent/subject of the sentence. Hence, SVO order is used to disambiguate and to indicate the first argument as the subject of the sentence. Furthermore, PAM occurred in 66 clauses, although it was not part of the stimulus sentences. It mainly occurred with animate arguments and was placed in a clause-internal position preceding the object. It appeared with modified agreement verbs and in most cases, PAM only agreed with the object. Hence, my data points to the idea that PAM is a differential object marker as argued by Bross (2020b). In section 6.5, I compared my data with a recent approach on subject drop in DGS (Oomen 2020; Oomen & Kimmelman 2019). It was claimed that body-anchored verbs do not allow an omission of third-person subjects but license first-person subject drop. Neutral and agreement verbs,

however, license the drop of first- and third-person subjects. I found cases with body-anchored verbs and omitted third-person subjects contradicting these claims. However, this might be due to the coding decisions made for this dissertation. In section 6.6, I discussed verb doubling, animacy of the arguments and reversibility as influencing factors on word order in DGS. SVOV order might be explained by methodological reasons since these clauses had SVO order in the presented stimulus sentences. I assume that signers unconsciously added a final verb to the structure, which gives further evidence for SOV as the basic word order of DGS. Animacy of the arguments and the semantic reversible character of the situation did not influence word order in DGS in this study but need further investigation.

7 Theoretical implications for clause structure in DGS

In this chapter, I will discuss and compare my results to previously suggested accounts for DGS. It is important to note that my goal is the analysis of basic word order, in particular the position of object compared to the verb in main declarative clauses, as well as the interaction of clause structure with agreement marking. The presented accounts (Bross 2020a; Bross 2020b; Oomen 2020; Pfau, Salzmann & Steinbach 2018) are not mainly concerned with these issues but nevertheless offer interesting directions for the analysis of clause structure in DGS. In 7.1, I will firstly address methodological issues for researching word order in DGS and will discuss the findings that need to be accounted for by a theory on word order based on my data. In section 7.2, I will compare my findings with the proposal by Pfau, Salzmann & Steinbach (2018) and in section 7.3, I will continue with a discussion of the approach by Bross (2020a; 2020b). In section 7.4, I will look at the suggested clause structures proposed by Oomen (2020) and in section 7.5, I will finally make some suggestions how my data could be theoretically handled.

7.1 Analyzing word order in DGS: methodological issues and basic facts

Before analyzing and comparing the main outcomes of this dissertation with other theoretical proposals for word order and agreement in DGS, a short note on the chosen empirical method is necessary. In general, the type of data collection and the associated obtained results have consequences for the development of linguistic theories. For this dissertation, data was collected by using a Sentence Reproduction Task. Signers were confronted with videotaped stimulus sentences which they should reproduce after memorizing them. The presented stimuli were controlled for word order as well as verb type and as so far, the reproduced data should have been limited to a small set of answers possibilities. Nevertheless, methods that elicit production data face the challenge that they obtain more varying answers and results compared to other methods such as questionnaire studies or grammatical judgments tasks. Consequently, the chosen method did not prevent the participants to produce answers that differed from the presented stimuli. The answers showed a huge variation concerning produced word order or contained verbs different from those presented in the stimuli. Furthermore, variation was caused due to the modified design of the SRT. Reproduction tasks carried out for language assessment goals usually involve stimuli increasing in length and complexity and reproduction of those follows presenting the prompt. In the current task, participants were encouraged to memorize the content of stimuli rather than the exact

order of signs and reproduction followed a time delay to prevent the participants from directly copying the stimulus sentence. This procedure might have had effects as well. Despite the type of data collection, the sociolinguistic aspects of the Deaf community and signer population mentioned in section 2.1 had consequences for the current investigation. The difficult language acquisition and transmission situation of DGS as well as the historical, political and educational context have influenced the structure of DGS. In addition, the lack of standardization and the regional spread of the Deaf community and deaf schools supported that DGS shows a lot of dialectal variation on the lexical and morphosyntactic level. Taken together, all these mentioned aspects, namely research method and sociolinguistic dimensions, contributed to the observed variation. Subsequently, it is challenging to compile all varying findings into one formal theory. Based on my data, such a formal theory needs to address the following issues:

- The theory must account for the most frequently observed word order pattern. Based on the criterion of frequency DGS is a SOV language. This is further supported by the fact that 77.2% of SOV input stimuli sentences and 59.6% of SVO input stimuli sentences were realized as SOV answer sentences produced by the participants.
- The theory must explain orders that differ from the frequently observed SOV order. I showed that the place of articulation as well as the lack of agreement marking might explain SVO order. OSV order can be explained by the ground-figure-predicate relationship and by the effect of information/discourse structure. Furthermore, I argued that SVOV order was mainly found due to methodological reasons.
- The theory must incorporate influencing factors on word order such as verb type. I investigated whether different verb types show varying clause structures and found that body-anchored plain verbs prefer SVO order, while neutral plain verbs, agreement verbs, spatial verbs and handling classifier verbs favor SOV order.
- The theory must address the interaction of agreement marking and word order. Whereas plain verbs are traditionally analyzed as showing no agreement, agreement and spatial verbs do mark agreement and prefer SOV order cross-linguistically. In addition, I noticed that agreement verbs lacking agreement marking frequently appear with SVO order.
- Finally, a theory must account for the use and distribution of agreement markers such as PAM in DGS. PAM in DGS can be used with different verb types (plain and

agreement verbs which might be modified or not) and might have different functions (agreement auxiliary or differential object marker). The position of PAM shows variation since PAM can be placed verb-finally, pre-verbally or immediately preceding the object of the clause.

Hence, such a theory must be able to derive verb-final structures but also needs to be flexible enough to account for word order variations and the issues mentioned above. Furthermore, this dissertation and the presented SRT study investigated one specific aspect of word order in DGS. As I discussed in section 4.2.3, formal theories on word order and clause structure in sign languages also take other aspects such as the use and distribution of non-manuals and the position of adverbs, auxiliaries, modals and negative elements into account, which have not been the focus of this dissertation. It is further worth noticing that the presented accounts and theories proposed for DGS had a different goal and used different methods than those presented in this dissertation. Pfau, Salzmann & Steinbach (2018) propose a unified syntactic theory of agreement and incorporate plain verbs and PAM in their analysis. They verified their claims by consulting two native signers. On the other hand, Bross (2020a; 2020b), is concerned with the general clause structure of DGS as well as the function and distribution of PAM in connection to object shift observed in DGS. His analysis is based on data from thirteen native signers who translated written German sentences and provided grammatical judgments thereof. The analysis of Oomen (2020) is based on corpus data of DGS and her goal is to provide a classification of verb types in DGS and their semantic and morphosyntactic properties. Hence, these accounts are not primarily concerned with word order and word order variation in DGS. Especially word variations due to verb type influences is not part of their research. In this respect, their analyses are only partial applicable to my data. Nevertheless, they target word order and thus, have consequences for an analysis of clause structure in DGS. In the following, I will therefore compare my findings with their predictions and will discuss whether my results correspond to or differ from the offered arguments.

7.2 Pfau, Salzmann & Steinbach (2018)

Pfau, Salzmann & Steinbach (2018) offer a syntactic analysis of agreement within a minimalist framework and assume that all verb types are involved in the realization of agreement. Agreement verbs realize agreement via path movement and/or via finger/palm orientation, while plain verbs realize agreement on PAM. Their theory was previously presented in section 4.4.3; however, I will again shortly summarize their main assumptions.

In their theory, agreement verbs differ from plain verbs by assuming different verb movements triggered by features for each of the verb types. Agreement verbs are carrying a [*v*] feature that leads to head movement to v, whereas plain verbs do not have such a feature and movement does not take place. v has a [*T*] feature, consequently the head of v always moves to T (with plain and agreement verbs). However, a lexical V moves only in the case of agreement verbs (forward and backward agreement verbs) but not with plain verbs. Therefore, these movement restrictions lead to the formation of different complex heads: a V+v+T head with forward agreement verbs and a v+T with plain verbs. v is realized as zero with agreement verbs but as PAM with plain verbs.

Their theory is based on the assumption that PAM functions as an agreement auxiliary and realizes agreement with subject and object. My analysis of data revealed ten clauses that clearly showed that the path movement of PAM went from subject to object locus, while the fingers were facing the object argument. As so far, agreement was realized with subject and object as predicted by Pfau, Salzmann & Steinbach. However, only one of those cases involved a clause-final PAM as in (178)a). Moreover, I identified 56 clauses in which PAM marking only targeted the object (178)b). In these cases, the path movement of PAM started either in the neutral signing space or at the location in space, which was congruent with the previous sign, and as such, agreement was only realized with the object argument.

- (178) [DGS]
- a. NEW EMPLOYEE#PERSON_{3a}++ IX_{1pl} BOSS_{3b} 3bACCEPT₁ 3aPAM_{3b}
 ‘The new employees accept the boss.’
- b. IX_{3a} GIRL PAM_{3a} POSS_{3a} DOLL LOVE
 ‘The girl loves her doll.’

Furthermore, their analysis predicts that PAM is obligatory used with plain verbs and prohibits occurrences of PAM with agreement verbs. PAM is only spelled-out in a v+T head with plain verbs, but not in the V+v+T head with forward agreement verbs where v is realized as zero. However, my data showed that plain verbs rarely occurred with PAM as in (178)b). Instead, PAM is frequently found with (un)modified agreement verbs. I identified twelve occurrences of PAM with unmodified agreement verbs and 49 occurrences of PAM with modified agreement verbs. The latter realize a kind of ‘double-agreement’ (179). My findings therefore seem to contradict their assumptions.

- (179) POSS₁ FATHER_{3b} PAM_{3a} POSS₁ GRANDMOTHER_{3a} GARDEN_{3b} SHOW_{3a} [DGS]
 ‘My father shows my grandmother the garden.’

Pfau, Salzmann & Steinbach suggest the following arguments to capture PAM and (un)modified agreement verbs. PAM with an unmodified agreement verb would require that verb movement of agreement verbs to v is optional. However, it is not clear how this kind of optionality is triggered. For PAM with modified agreement verbs they suggest a bi-clausal structure. They compare sentences such as (180)a) involving plain verbs with sentences containing modified agreement verbs such as (180)b) (Pfau, Salzmann & Steinbach 2018: 31).

- (180) [DGS]
- a. MOTHER IX_{3a} NEIGHBOR IX_{3b} LIKE_{3a} PAM_{3b}
 ‘(My) mother likes the neighbor.’
- b. MOTHER IX_{3a} NEIGHBOR IX_{3b} TRUST_{3b} PAM_{3b}
 ‘(My) mother trusts the neighbor.’

They provide the following evidence for a bi-clausal analysis: i) modal verbs can be placed between modified agreement verbs and PAM but not between plain verbs and PAM; ii) PAM cannot be cliticized to the modified agreement verb but to the plain verb; iii) a subject pronoun copy can appear between the modified agreement verb and PAM but not between plain verb and PAM and iv) the spreading behavior of a negative headshake is different in both cases. Considering iv) they found that the headshake in general can appear either on PAM and on the verb or it only accompanies the verb. However, cases that involve an unmodified verb and PAM, the headshake cannot spread on PAM but appears on the verb. Additionally, they assume that PAM with modified agreement verbs triggers a M-implicature (Levinson 2000) with readings such as ‘my mother trusts the neighbor; she really trusts him’.

Furthermore, their theory is based on clause-final occurrences of PAM. (181) lists all the examples with a clause-final PAM which were identified in my data. Interestingly, all those examples involve the backward agreement verb ACCEPT. Whereas (181)a) and (181)b) involve an unmodified verb, (181)c) and (181)d) contain a modified agreement verb. However, agreement is not realized with the subject and object as predicted by the authors, but with the object. The end of the path movement is directed towards the signer and not towards the area of the signing space where the subject was previously signed. I discussed these

examples with two linguistically trained deaf informants²⁷ and they remarked the following interesting aspects. Informant 1 always placed PAM sentence-internally before the object, while for informant 2 a clause-final PAM is generally preferred. Although informant 2 prefers a sentence-final placement of PAM, he would reject a clause-final PAM in cases with a modified version of ACCEPT due to economic reasons. The path movement of ACCEPT would start at the locus of the object and end at the locus of the subject and the path movement of PAM would involve the reversed movement from subject towards object locus. For him, it seems unnecessary to have both opposite movements. This could be a reason why the verb is unmodified in (181)a) and (181)b) and why subject agreement is not expressed in (181)c) and (181)d). If PAM was placed before the object, informant 2 would accept a modified PAM and a modified verb. Informant 1 would generally reject a clause structure with a sentence-final PAM. In clauses in which PAM is placed before the object, he would also accept the resulting double agreement marking if both PAM and the verb would be modified. I also checked with both informants whether a reading such as ‘the new employees accept the new boss; they really accept him’ as suggested by Pfau, Salzmann & Steinbach is possible in (181)c) and (181)d), but both of my informants denied such a reading possibly also due to missing context information. Hence, these observations offer interesting possibilities for future research. It should be further investigated whether multiple agreement marking in SOV clauses is generally less preferred than in clauses appearing in SVO order and whether the reasons for such a difference are according to economic or other reasons.

- (181) [DGS]
- a. NEW EMPLOYEE#PERSON_{3a}++ POSS_{3b} NEW BOSS_{3b} ACCEPT PAM_{3b}
 - b. NEW EMPLOYEE#PERSON_{3a}++ NEW BOSS IX_{3b} ACCEPT PAM_{3b}
 - c. NEW EMPLOYEE#PERSON_{3a}++ IX_{1pl} BOSS_{3b} _{3b}ACCEPT_{1 3a}PAM_{3b}
 - d. NEW EMPLOYEE#PERSON_{3a} POSS₁ BOSS_{3b} _{3b}ACCEPT₁ PAM_{3b}
- ‘The new employees accept the (new) boss.’
 ?? ‘The new employees accept the (new) boss; they really accept them.’

Moreover, the suggested bi-clausal analysis will not work if PAM is positioned preverbally. However, I found that PAM mainly occurred in preverbal position and was further placed preceding the object. Pfau, Salzmann & Steinbach suggest to treat preverbal instances of PAM differently than clause-final occurrences and argue for a preverbal PAM as a differential object

²⁷ Both informants are male, deaf and fluent signers of DGS. Informant 1 (age 34) has hearing parents, is deaf since he is 1,5 years old and learned DGS at the age of 3. Informant 2 (age 46) has deaf parents and acquired DGS from birth.

marker (as proposed by Bross (2020b), see the next section 7.3). This would imply the assumption of two different instances of PAM with different functions, one as an auxiliary or agreement marker and the other one would be an instance of DOM. Since the purpose of the presented theory was to develop a unified syntactic analysis for agreement, Pfau, Salzmann & Steinbach make no claims about word order or variations of order due to verb type differences. According to my data, body-anchored plain verbs favor SVO, which is not captured by their theory.

7.3 Bross (2020a; 2020b)

In contrast to Pfau, Salzmann & Steinbach, Bross (2020b) proposes to treat PAM not as an auxiliary or agreement marker but as a preposition like element which functions as a differential object marker. His claim is supported by the behavior of PAM observed in nominalizations. If PAM would be an auxiliary, it should disappear in nominalizations like in (182) (Bross 2020b: 18). However, PAM surfaces in nominalizations as prepositions do.

- (182) [DGS]
- a. IX₁ POSS₁ LOVE PAM_{3a} PAUL_{3a} NEVER FORGET
 ‘I will never forget about my love for Paul.’
- b. *IX₁ POSS₁ LOVE PAUL_{3a} NEVER FORGET
 *‘I will never forget about my love for Paul.’

In the investigated southern varieties of DGS, Bross found a clear preference for a clause-internal position of PAM. Although there is some kind of variation in the position, PAM preceding the object was the most preferred one as in (183) (Bross 2020b: 18). As described in sections 5.6.6 and discussed in section 6.4.2, I made a similar observation.

- (183) [DGS]
- a. MARIA_{3a} PAM_{3b} PAUL_{3b} ANGRY
- b. MARIA_{3a} ANGRY PAM_{3b} PAUL_{3b}
 ‘Maria is angry of Paul.’

Bross further claims that PAM only agrees with the object and not with the subject. This assumption is only partly represented in my data. I found ten clear cases that show that PAM moves from the subject locus to the object locus which speaks for an agreement auxiliary as proposed by Pfau, Salzmann & Steinbach (2018) and others. Nevertheless, the majority of

PAM occurrences only agreed with the object as observed by Bross, which doubts the analysis as an auxiliary. Moreover, Bross argues that PAM is a differential object marker since its use is triggered by the animacy, definiteness and affectedness of the object. In my data, this observation holds as well since PAM only occurred with animate objects. Bross suggests a couple of verbs in DGS that allow for an obligatory or optional use with PAM such as ADVISE, BE-ANGRY, HATE (obligatory) or BEAT, HIT, KILL (optional). He draws a connection to the affectedness scale proposed by Tsunoda (1985) and claims that verbs that belong to the pursuit, knowledge and feeling class always occur with PAM. While effective action and perception class verbs allow for an optional use of PAM, verbs belonging to the lowest ranked classes are never used with PAM. The hierarchy of Tsunoda in connection to PAM is illustrated in figure 57 (Bross 2020b: 24).

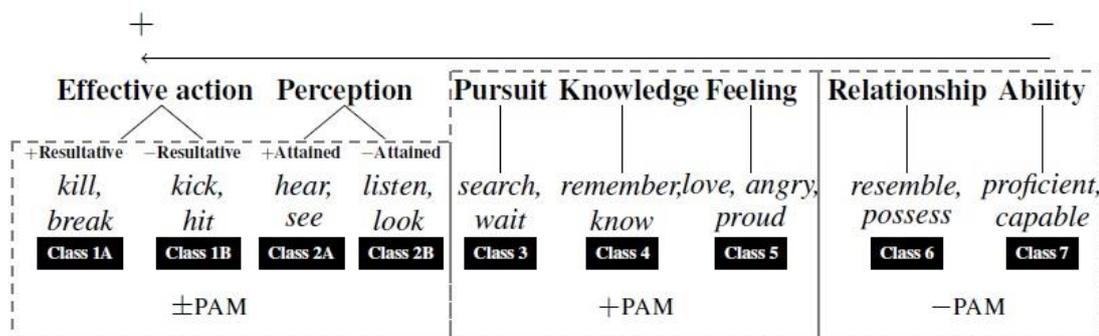


Figure 57: Tsunoda's (1985) verb classes in connection to the use of PAM (Bross 2020b: 24)

The following verbs involved PAM insertion in my data: LOVE/LIKE, TEASE, ACCEPT, SHOW, PICK-UP, HELP, INFORM, ASK, INVITE, REPEAT and WAIT. It warrants further investigation how these verbs are connected to the proposed affectedness scale and the obligatory or optional use of PAM.

Moreover, Bross claims that PAM causes a definite/referential reading (example repeated here as (184) (Bross 2020b: 20)). In (184)a the verb SEE is used without PAM and a definite reading might be possible, whereas in (184)b the use of PAM obligatorily triggers a definite reading.

(184) [DGS]

a. YESTERDAY PAUL_{3a} POLICE#PERSON_{3b} SEE_{3b}

'Yesterday Paul saw a/the policemen.'

b. Context: Do you remember the policeman that Paul talked about?

YESTERDAY PAUL_{3a} PAM_{3b} POLICE#PERSON_{3b} SEE_{3b}

'Yesterday Paul saw the policeman.'

Bross gives further arguments to show that there is a strong relationship between PAM and the object. Firstly, PAM is often cliticized to the object, i. e. both share the same handshape and there is a smooth transition between PAM and the object sign. Secondly, modal verbs and adverbs cannot intervene between PAM and the object as in (185)a) and (185)b) (Bross 2020b: 19). Thirdly, adverbs in sentences with PAM are placed following the object as in (185)c) (Bross 2020b: 30).

(185) [DGS]

a. *PAUL_{3a} PAM_{3b} ALWAYS MARIA_{3b} ANGRY

'Paul is always angry at Maria.'

b. *PAUL_{3a} PAM_{3b} MAY MARIA_{3b} ANGRY

'Paul is allowed to be angry at Maria.'

c. PAUL_{3a} PAM_{3b} MARIA_{3b} OFTEN INSULT

'Paul often insults Maria.'

As a general consequence, Bross assumes that object shift regularly takes place in DGS, which goes hand in hand with differential object marking. He observed that direct objects which precede adverbs in DGS have a more specific, more definite or more presuppositional interpretation as illustrated in (186)b) compared to (186)a) (Bross 2020b: 28).

(186)

[DGS]

- a. Context: Paul is walking through the village and knocks on every door. First, he knocks on one door, then on another.

NOW PAUL AGAIN DOOR KNOCK

‘Now, Paul is again knocking on a door.’

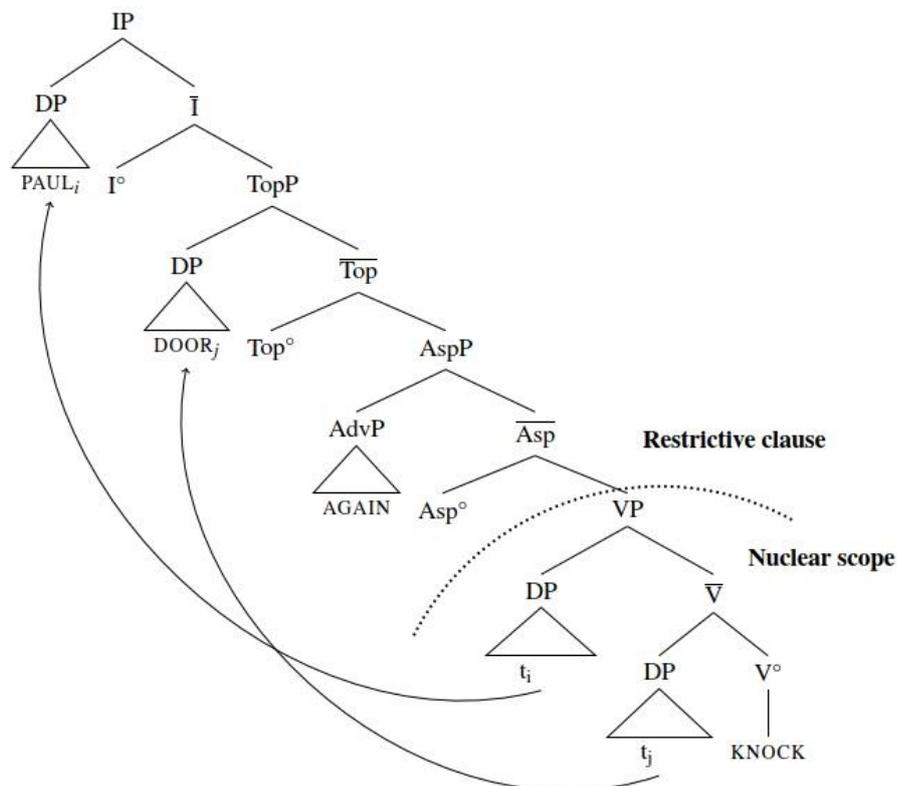
- b. Context: Two days ago, Paul knocked on the door. Yesterday Paul knocked on the door.

NOW PAUL DOOR AGAIN KNOCK

‘Now, Paul is again knocking on the door.’

Thus, Bross assumes that object shift has taken place in (186)b) which describes leftward movement of a DP from the position inside the VP to a position outside of the VP. Bross suggests that DPs, which have such definite readings, move leftward out of the VP into a higher structural topic position inside the IP. Indefinite DPs, however, stay in-situ inside the VP. He suggests a clause structure which involves a right-headed VP and a left-headed IP. He locates AGAIN in the specifier of a functional projection labeled $Asp_{\text{frequentative}(I)}$ below a topic position which hosts the moved object as shown in (187) (Bross 2020b: 29).

(187)



In (187), KNOCK is base-generated in a right-headed V and the direct object DOOR has its base position in the specifier of VP. Since Bross assumes that DOOR receives a definite reading ('the door'), the object moves leftward into the specifier position of an IP internal topic phrase TopP. The subject PAUL moves leftward to SpecIP.

Moreover, Bross observes that sentences involving PAM are often accompanied by object shift since PAM yields a definite reading as well. He found that clauses involving PAM and adverbs, the adverb usually follows the object assuming that object shift has taken place. I made a similar observation and found sentences such as (188) in which the adverb OFTEN follows the object SISTER. The interaction of PAM, adverbs and object placement thus deserves further investigation in future.

(188) BOY_{3a} PAM_{3b} SISTER_{3b} OFTEN_{3a} TEASE_{3b} [DGS]
 'The boy often teases his sister.'

Although his analysis nicely captures the position and behavior of PAM that I identified and detected in my data, he offers no claims about an interaction of object shift and different word orders. For instance, he observed that SVO order is typically used with volitional verbs and volitional markers (repeated here as (189), (Bross 2020a: 83) and (Bross 2020a: 231)). Furthermore, he identified clauses with SVO order and the use of PAM as in (183)b). However, it remains open for future research how object shift, the position of PAM and SVO order in DGS interact.

(189) [DGS]
 a. MARJOLAINE LIKE BEER
 'Marjolaine likes beer.'
 b. PAUL WISH BEER DRINK
 'Paul wants to drink a beer.'

7.4 Oomen (2020)

In a recent corpus study on verb types in DGS, Oomen (2020) found a connection between verb type and word order as previously claimed in the literature and as hypothesized in this dissertation. As mentioned before, Oomen proposes different verb type categories, which are grounded on semantics and iconicity. She differentiates body-anchored plain verbs, neutral verbs, agreement verbs and spatial verbs. In contrast, the verbs investigated in this

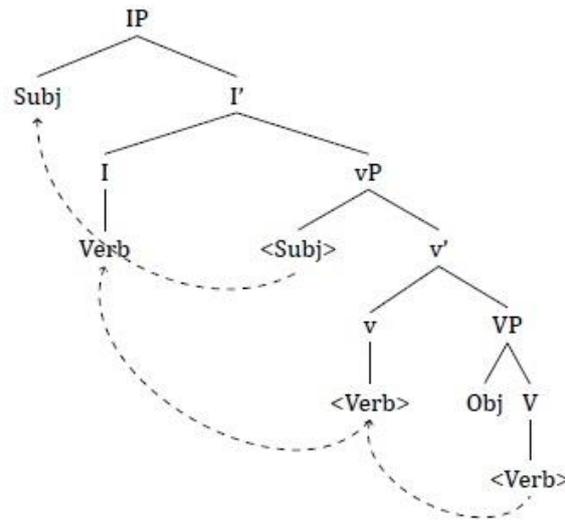
dissertation are classified based on morphosyntactic criteria. Subsequently and in contrast to Oomen, body-anchored and neutral plain verbs were not distinguished separately. However, handling classifier verbs were additionally included in the analysis. Consequently, there are deviations with regard to the verb type division for the following verbs: EAT (body-anchored vs. classifier/handling verb), THROW (spatial vs. classifier/handling verb), SIT (neutral vs. spatial verb) and POUR (neutral vs. classifier/handling verb). Though verb type classification differs, the corpus investigation by Oomen yields similar results than the experimental data elicited for this dissertation. In particular, Oomen found that body-anchored verbs favor postverbal objects. More than two-third of body-anchored verbs (70%) occurred with VO order, whereas only 30% occurred with OV order. In my data, I observed that among the investigated plain verbs, (S)VO order mainly occurred with body-anchored plain verbs and not with neutral plain verbs. However, if all of the 45 occurrences of transitive body-anchored plain verbs were taken into account, I found that 20 of them had a (S)VO order and 25 an (S)OV order. Hence, my findings are in line with Oomen. For agreement verbs, Oomen observed that they favor preverbal objects. 64% of agreement verbs had an OV order and 36% had a VO order in her data. I distinguished between forward and backward agreement verbs, but both showed a clear preference for preverbal objects in my data. Regarding neutral plain verbs, they strongly preferred preverbal objects in Oomen's data since 96% of cases occurred in OV order and 4% showed VO order. I did not separately analyze neutral verbs, however, I further looked at handling classifier verbs which show a strong preference for OV order (85.8%).

Oomen offers a unified agreement analysis and proposes that body-anchored verbs, neutral and agreement verbs take part in the agreement process as previously suggested by others (Lourenço 2018; Lourenço & Wilbur 2018; Pfau, Salzmann & Steinbach 2018) (and see the detailed discussion in 4.4.3). She assumes that nouns and verbs are carrying a referent feature instead of a person feature. Body-anchored verbs bear an inherent speaker-referent feature residing in the I-head which leads to a default first-person interpretation if the subject argument is dropped. Body-anchored (plain) verbs are thus assumed to be in an agreement relationship with the subject argument. Neutral verbs and agreement verbs bear non-inherent referent features which reside in the head of the IP and vP. Neutral verbs agree with the subject and the internal object in transitive constructions or with the sole available argument in intransitive constructions. Agreement verbs agree with the subject and direct object in transitive clauses and with subject and indirect object in ditransitive clauses.

Oomen assumes SOV as the basic structure of DGS. To account for word order variations observed with the different verb types, she offers the following two suggestions. Suggestion

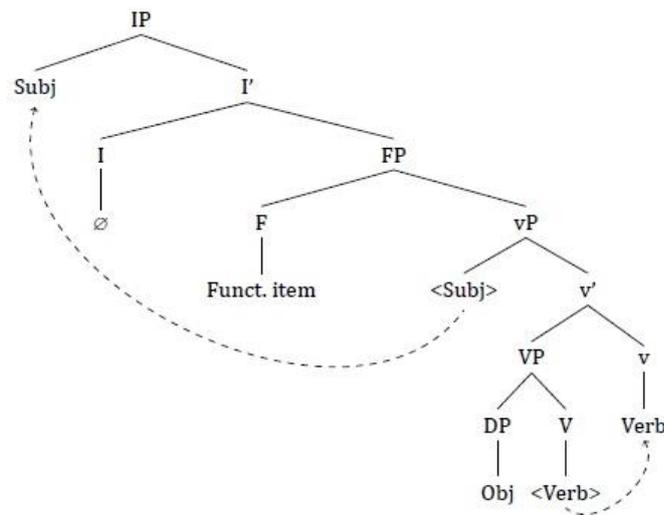
1 illustrated in (190) (Oomen 2020: 316) involves the derivation of SVO order from an underlying SOV order. To account for that, she assumes a right-headed VP, but a left-headed vP and IP. Since body-anchored verbs agree with the speaker-referent sitting in the I-head, the verb moves leftward to I^o in order to pick up the relevant feature. Following Agree, the subject moves to SpecIP yielding a SVO order.

(190)



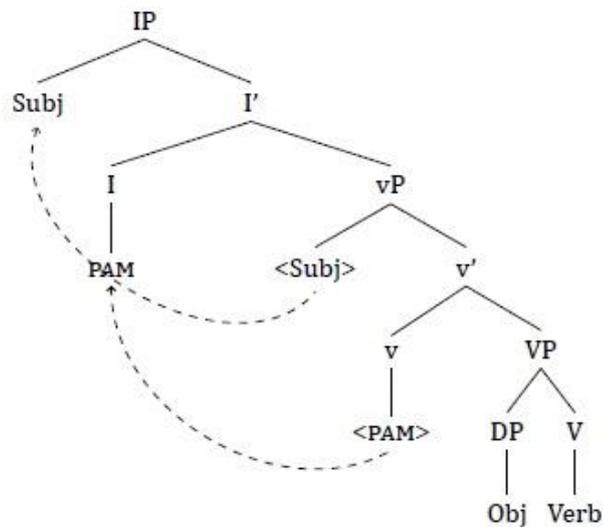
As Oomen points out the structure in (190) fits to the preferred SVO order with body-anchored plain verbs but cannot explain the preferred SOV order observed with agreement and neutral verbs. To derive SOV from an underlying SOV order, she proposes the structure in (191) (Oomen 2020: 317). Suggestion 2 involves a right-headed VP, a right-headed vP and a left-headed IP. The verb moves from V to v which would, assuming a right-headed v, provide the right word order. She proposes an intervening functional head which prevents the verb to move higher upwards than the v-head. Afterwards, the subject moves to SpecIP. As Oomen remarks, several points are problematic with this account. Firstly, it is unclear which functional head intervenes and prevents movement; secondly, this head should be present with neutral and agreement verbs but not with body-anchored verbs; thirdly, it is not clear how subject agreement is realized since the verb does not move to I.

(191)



Regarding PAM, Oomen proposes the structure presented in (192) (Oomen 2020: 320). She identified ten clauses involving PAM; six of them occurred with a plain verb, two with a spatial verb and two with an agreement verb. Although the number of occurrences is low, it is interesting that plain verbs are more common in her data in contrast to the claims made by Bross (2020b) and in contrast to my findings. This difference could be due to methodological reasons since her data is based on corpus data compared to the more controlled elicited data that was used in this dissertation. Contrary to Bross (2020b), but in line with Pfau, Salzmann & Steinbach (2018), Oomen found clauses in which PAM clearly marks agreement with the subject and the object of the clause; hence, she assumes that PAM is an auxiliary. Concerning the order of PAM, she identified five clauses with a clause-final PAM and five clauses with PAM preceding the object. However, this shows that the order of PAM is more flexible than expected and needs further investigation. As the underlying structure, Oomen assumes a preverbal position of PAM and makes no claims about the motivation for PAM to be positioned clause-finally. In (192), the I- and v-head are on the left. She follows the idea of Pfau, Salzmann & Steinbach (2018) and assumes that a plain verb stays put in V and PAM moves from v to I.

(192)



7.5 Proposals to account for DGS clause structure

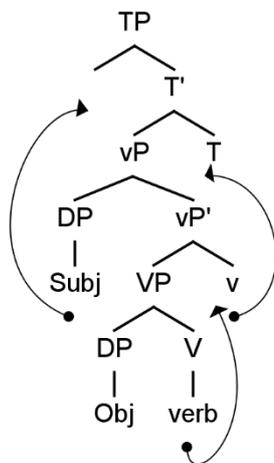
The data presented in section 5.6 shows that SOV is the most common word order and that it is used with body-anchored and neutral plain verbs, forward and backward agreement verbs, spatial verbs and handling classifier verbs. SOV order is favored with agreement verbs and even stronger found with handling classifier verbs. SVO order, however, is found with plain verbs that are articulated on or near the body in line with the findings by Oomen (2020). Furthermore, SVO order is often used with agreement verbs that lack agreement modification. Forward agreement verbs show a decrease in agreement marking, while backward agreement verbs were never modified in SVO structures. Hence, word order and agreement marking obviously interact. The agreement marker PAM was used with animate arguments and mainly (un)modified agreement verbs. It was frequently based preverbally preceding the direct object corresponding to observations made by Bross (2020b).

In sign language literature on word order, it is found that agreement and classifier verbs exhibit a freer word order and behave more flexible. Napoli & Sutton-Spence (2014) offer a suitable phonological explanation for these findings. Agreement and classifier verbs both depend on their arguments. With agreement verbs, the direction of path movement and/or finger- and hand orientation needs to be determined, which requires the arguments to precede the verb. The same holds for classifier constructions since the particular classifier handshape needs to be selected in accordance with the denoted object. This line of argumentation would then imply that all verbs whose phonological form does not depend on the arguments in the clause, namely plain verbs, should occur with SVO order. Given

these arguments, the account of Napoli & Sutton-Spence speaks for an underlying SVO order, which allows phonologically dependent verbs to appear clause-finally.

However, given the clear preference for SOV order in my data, I argue for SOV as the basic word order of DGS in line with previous accounts (Bross & Hole 2017; Happ & Vorköper 2006; Herrmann 2013; Herrmann & Steinbach 2013; Keller 1998; Pfau, Salzmann & Steinbach 2018; Pfau & Glück 2000). As suggested by Pfau, Salzmann & Steinbach (2018), Herrmann (2013) and Pfau & Glück (2000), I assume a symmetric phrase structure with a right-headed verb and tense phrase²⁸. If *v*, *V*, *T* are assumed on the right, the right surface word order of **Subject-Object-Verb** would be derived as shown in (193).

(193) Symmetric structure



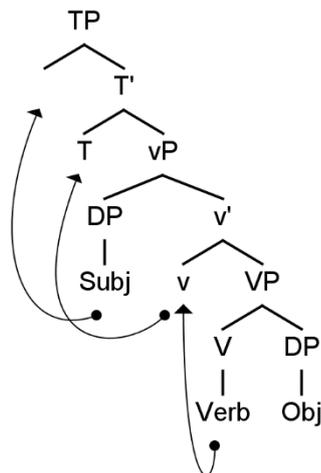
With the structure proposed in (193), it is difficult to derive the **Subject-Verb-Object** order which is found with body-anchored plain verbs or with agreement verbs that lack agreement modification. To account for SVO, *T* and *v* have to be on the left as proposed by Oomen (2020), which was previously illustrated in (190). Another solution would be to formalize constraints within Optimality theory (Prince & Smolensky 1993) as outlined in section 4.1.3 and as for instance, Müller (1999) proposed for German word order variation. Such constraints could probably imply phonological constraints for body anchoring or the involvement of classifier handshapes. A body-anchoring constraint would regulate that plain verbs specified for the body [+body-anchored] would precede objects, whereas plain verbs not specified for the body [-body-anchored] would follow objects. A further classifier

²⁸ Verbs in DGS do not inflect for tense; tense is rather expressed by time adverbials usually occurring at the beginning of the clause. Nevertheless, Pfau & Quer (2007; 2002) assume that T° hosts modal verbs in DGS and that subjects move to SpecTP. I follow their line of argumentation.

handshake constraint [-classifier handshake] would make the prediction that verbs without classifier handshakes would precede the object and verbs marked for [+classifier handshake] would follow their objects. Similarly, an agreement modification constraint would generate that [-modified] agreement verbs precede objects and [+modified] agreement verbs follow objects. Such constraints would then generate the optimal output candidate: SOV for modified agreement, classifier and neutral plain verbs (assuming that they may be marked for agreement) and SVO for body-anchored plain verbs and unmodified agreement verbs.

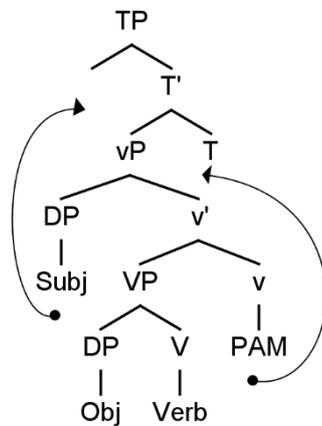
Another solution would be a strict asymmetric structure (Kayne 1994) as in (194) which would easily account for the clauses with SVO order. In order to derive SOV structure, further movements of the verb and subject into higher positions would be required.

(194) Asymmetric phrase structure



Regarding the analysis of PAM, I propose to treat a clause-final occurrence of PAM in line with Pfau, Salzmann & Steinbach (2018). I assume that the lexical verb stays put in V and PAM moves upwards to T (195). For preverbal occurrences of PAM, the most common identified position in my data, I suggest to treat PAM as a differential object marker as proposed by Bross (2020b).

(195) Clause-final PAM



To summarize this section, I made several suggestions how to account for clause structure in DGS. Since my data only makes assumptions about the impact of verb type on word order and reveals an interaction of agreement marking and word order, no precise statement can be made in favor of one of the proposed analyses. Furthermore, the use and the distribution of PAM identified in this dissertation supports the analysis of PAM as a differential object marker; however, there are cases which clearly indicate an agreement function of PAM. Hence, it seems that there are two instances of PAM in DGS based on the presented data. This might be due to sociolinguistic aspects such as dialect, age or background of linguistic knowledge, but further research needs to investigate such a correlation.

7.6 Summary

In chapter 7, I compared my results with recently proposed accounts for agreement and clause structure in DGS and discussed the theoretical implications that result from that. The account by Pfau, Salzmann & Steinbach (2018) offers a purely syntactic analysis of agreement in DGS and is based on verb movement triggered by features of the verb, the formation of different heads and the insertion of PAM with plain verbs. Path movement or orientation of the hands realize agreement with agreement verbs, while plain verbs realize agreement by an insertion of PAM and not by movement of the verb. This implies that PAM always occurs with plain verbs and that PAM is positioned clause-finally. However, both aspects were not reflected in my data. PAM occurred in a clause-internal position preceding the object and with (un)modified agreement verbs. Bross (2020a; 2020b) therefore claims that PAM behaves like a differential object marker since PAM occurs mainly with animate arguments and marks agreement with the object (and not with subject and object). This line of argumentation

seems to explain the position and behavior of PAM in my data best. Bross (2020a; 2020b) furthermore argues for object shift in combination with PAM in DGS but so far, it is not clear how this might interact with different word orders. Oomen (2020), on the other hand, assumes SOV as the basic structure of DGS and offers two suggestions how to derive SVO structures for body-anchored plain verbs and SOV clause structures for neutral and agreement verbs. Since there is strong evidence for SOV as the most common word order in DGS, I argue for SOV as the basic word order. In a symmetric clause structure, this could be derived by assuming a right-headed VP, vP and TP. The derivation of SVO order, which is commonly used with body-anchored plain verbs, would imply a different phrase structure assuming a left-headed vP and TP in line with Oomen (2020). Another proposal in line with Kayne (1994) implies a strict asymmetric structure with all heads on the left and the requirement of further movements to derive SOV order, while a further suggestion is based on the formulation of constraints within an OT account to derive the respective orders.

8 Concluding remarks

This dissertation presented the first comprehensive investigation of word order in DGS and examined whether morphosyntactic factors such as verb type affect clause structure in DGS. In general, word order is one of the well-researched topics in sign language linguistics and in particular, the literature on word order in DGS claims that the basic word order in DGS is SOV. However, this assumption has not yet been investigated systematically. The findings of this dissertation support the view that DGS is a SOV language but also show that verb type and the interaction with agreement marking are among the factors that can explain word order variation in DGS. In section 8.1, I will firstly summarize the main findings of this dissertation. In section 8.2, I will secondly discuss the methodological and theoretical challenges that occurred while researching word order in DGS. Finally, in section 8.3, I will offer suggestions for further research.

8.1 Summary of main results

This dissertation dealt with basic word order in DGS and presented the first comprehensive empirical investigation of word order and its interaction with verb type by using the method of a Sentence Reproduction Task (SRT). In the following, I will summarize the structure and main outcomes of this dissertation.

Chapter 2 gave insights into the observed variation in DGS and the heterogeneity of the Deaf community as the result of a difficult acquisition situation, the historical, educational and political background and a lack of standardization of DGS. Furthermore, it mentioned the academic research settings regarding DGS in Germany. Besides that, I introduced the linguistic structure of DGS with a focus on the description of morphosyntactic properties. I briefly illustrated simultaneous constructions, the grammatical use of space, the agreement and classifier system and the clause structure of DGS.

Chapter 3 offered the descriptive and empirical background on word order and agreement in spoken and sign languages. In the first part of this chapter, I described and discussed difficulties and challenges in the definition of basic word order referring to spoken and sign languages. Basic word order was defined as the order of subject and object relative to the verb in an unmarked transitive, declarative clause. In linguistic typology, languages are classified as SOV, SVO, VSO, VOS, OVS, OSV word order languages. Based on the example of German, I showed that classifying a language to one of these word order types is always tied to the theoretical research framework and might be biased by the criteria of frequency

of usage, distribution, simplicity and pragmatic neutrality. Additionally, I demonstrated that word order variation is the result of interacting morphosyntactic, semantic and pragmatic factors. Furthermore, typological research based on a large sample of spoken languages demonstrated that the position of object and verb correlates with other elements in the clause. In sign languages, modality specific aspects such as the simultaneous use of different manual and non-manual articulators further challenge the determination of basic word order. Moreover, studies of word order in sign languages showed that morphosyntactic (verb type, classifier constructions, aspect marking), semantic (animacy of the arguments, the reversible character of the situation, figure-ground relation) and pragmatic factors (given vs. new information, topic and focus marking) similar to spoken languages cause word order variation. The second part of chapter 3 described and defined the phenomenon of agreement in spoken and sign languages. I presented the main properties and features involved in expressing agreement, described differential object marking in spoken and sign languages and discussed whether verb agreement in sign languages show similarities or differences to agreement in spoken languages.

Chapter 4 firstly summarized theoretical approaches to word order based on spoken languages: Syntactic Typology, Generative Grammar and Optimality Theory. Whereas syntactic typologists seek for general word order patterns and assume different principles explaining such patterns, scholars working within a generative approach focus on the innate principles of language, hierarchical sentence structures and order as the result of movement processes. Word order variation within Optimality Theory is modelled as ranked and competing constraints. Additionally, OT puts emphasis on factors influencing word order. Secondly, I presented approaches to word order in sign languages. Gestural approaches focus on the pressure of the visual modality that forces word order choices, while functional/cognitive theories suggest that word order can be explained by modality specific factors and language external influences. In contrast, theories within a generative framework assume hierarchical syntactic structures and argue that syntactic principles proposed for spoken languages are relevant for word order in sign languages. Thirdly, I introduced two approaches to agreement in spoken languages, namely a typological canonical approach, which seeks to describe all possible manifestations of agreement, and the Minimalist Program, which defines agreement as a universal syntactic operation triggered by the need of checking phi-features. Finally, I presented agreement accounts proposed for sign languages: i) the gestural account (Liddell 1995; Liddell 2000; Liddell 2003; Liddell 2011; Schembri, Cormier & Fenlon 2018), ii) the thematic account (Meir 1998a; Meir 1998b; Meir 2002) and iii) featural accounts (Neidle et al. 2000; Rathmann & Mathur 2002; Rathmann &

Mathur 2008; Pfau, Salzmann & Steinbach 2018; Oomen & Kimmelman 2019; Oomen 2020) as well as a differential object marking analysis of PAM in DGS (Börstell 2019; Bross 2020b). Chapter 5 firstly discussed the (dis)advantages of empirical methods used for word order research in spoken and sign languages in general and provided an overview of word order studies in sign languages. Secondly, it presented the research design, the procedure and results of the SRT study on word order and its interaction with verb type in DGS. 22 native or near-native signers of DGS were confronted with conversations of two signers and had to memorize and reproduce the last critical sentence, which was manipulated according to verb position (verb-final or non-verb-final) and according to verb type (plain, forward and backward agreement, spatial and handling verbs). Frequency analysis revealed that (S)OV was the most frequent word order (64.7%) followed by (S)VO (12.6%), SV (12.2%) and other orders (10.5%). With regard to the order presented in the input stimulus sentences compared to the realized output orders by the participants, the majority of sentences presented in a verb-final order was realized with a verb-final structure (77.2% OV and 5.1% VO). As expected, the stimuli presented with a non-final verb resulted in a greater number of sentences realized with a VO order compared to the stimuli presented in verb-final position. Nevertheless, OV order was predominantly used (59.6% OV and 21.3% VO). Considering verb types, plain intransitive verbs were realized as SV and the majority of plain transitive verbs were used with a (S)OV order (31.8%). However, 16.2% of transitive plain verbs were realized as (S)VO order. Additionally, forward and backward agreement verbs occurred most frequently with a (S)OV order (74.9% and 77.9%). On the other hand, 15.6% of forward agreement verbs and 17.8% of backward agreement verbs occurred with (S)VO order. Interestingly, agreement marking decreased with forward agreement verbs used in (S)VO clause. Moreover, backward agreement verbs were never modified when realized with (S)VO order. In contrast, the majority of forward (84%) and backward agreement verbs (55.9%) used with SOV order exhibited a verb modification for person or number agreement in DGS. Moreover, 66 clauses were identified involving the person agreement marker PAM, although it was not included in the stimulus sentences. PAM occurred primarily with modified forward and backward agreement verbs (61 out of 66 clauses) leading to double agreement marking. In most cases, PAM agreed with the object (56 cases) and not with subject and object as previously claimed (only ten cases showed agreement with subject and object). Furthermore, PAM was mainly used with SOV order (90.9%) and placed before an animate object. Clauses with spatial verbs showed the most variation concerning order. Two third of the clauses involving a spatial verb were realized as (S)OV (65.3%). The second most common word order was OSV (12.9%). Word order with handling verbs was primarily SOV

(85.8%). Moreover, arguments were frequently omitted in DGS but subject drop occurred less in clauses with VO order. Subject drop was possible with all verb types but was rarely used with backward agreement verbs.

Chapter 6 discussed the presented results with previous analyses proposed for sign languages and offered possible explanations for the observed word order variations. Based on the criterion of frequency, DGS is a SOV language. This claim is further supported by the observation that the participants realized 77.2% of the OV stimulus sentences and 59.6% of the VO stimulus sentences as OV output orders. The position of object is affected by verb type as well as the presence of agreement marking in DGS. Transitive plain verbs which were articulated on or near the body appeared in (S)VO order which supports the suggestion by Oomen (2018; 2020) to differ between body-anchored and neutral plain verbs in DGS. Agreement marking of forward and backward agreement verbs decreased in clauses with SVO order (Fenlon, Schembri & Cormier 2018). Hence, agreement marking and word order interact in DGS. I further argued that word order is one mechanism to indicate subject and object arguments since an unmodified agreement verb used with SOV order results in a potential ambiguous sentence. If an unmodified agreement verb interferes between both arguments, the first argument will be indicated as the subject and the second argument as the object of the clause. OSV order occurred in clauses which involved locative constructions. OSV order exhibits a ground-figure-predicate relationship (Happ & Vorköper 2006) and might be related to discourse and information structural aspects such as less accessible topics (Herrmann 2015). SOV was still the preferred order with spatial and handling classifier verbs and regarding the latter, this might be an effect of the classifier handshape or an effect caused by the semantic characteristics of the verb and extensional character of the event (Napoli, Sutton-Spence & de Quadros 2017).

Chapter 7 compared the results with recently proposed accounts for agreement and clause structure in DGS and discussed the resulting theoretical implications. The data on PAM disagrees with the account by Pfau, Salzmann & Steinbach (2018) who argue that agreement with plain verbs is realized on PAM. They treat PAM as an agreement auxiliary, which agrees with subject and object based on the assumption that PAM is positioned clause-finally. Since PAM occurred mostly in clause-internal position preceding the object and was mostly used with modified agreement verbs, my data support the claim that PAM functions as a differential object marker (Bross 2020a; Bross 2020b). Bross further argues that the use of PAM is connected to object shift in DGS. However, more data needs to clarify how this interacts with word order variation in DGS. Oomen (2020) argues that body-anchored plain verbs should be distinguished from neutral plain verbs as a separate verb class since body-anchored

plain verbs show different subject drop (disallowance of third-person subject drop) and clause structure patterns (predominantly used with VO order) than neutral verbs. She further assumes that body-anchored plain verbs are in an agreement relationship with the subject. She proposes two possible derivations for the observed SVO/SOV variation in DGS. Although the suggested properties of subject drop in connection with body-anchored verbs were not observed in my data which might be due to methodological reasons, the preference for preverbal objects with body-anchored plain verbs was reflected in this dissertation.

In sum, this dissertation confirms empirically that SOV is the most common word order in DGS and reveals that morphosyntactic factors affect word order. Based on the criterion of frequency, I argue that DGS has SOV as its basic word order. As reported for other sign languages, verb type has an influence on clause structure. Agreement verbs and verbs (spatial and handling verbs) involving classifier handshapes appear clause-finally, whereas plain verbs might be positioned in clause-final or non-clause-final position with the peculiarity that mainly body-anchored plain verbs are found with a VO order. Moreover, this dissertation shows that clause structure, the presence of agreement marking and subject drop interact. Modified agreement verbs (forward and backward) prefer a clause-final position, while unmodified agreement verbs appear in VO order. Each of the investigated verbs licenses argument drop, but argument omission occurs less with VO order. The use and distribution of PAM observed in this dissertation mainly fits to an analysis of PAM as a differential object marker but further investigation is needed to account for the various observed findings.

8.2 Methodological and theoretical issues

This dissertation presented the first comprehensive and empirically based investigation of word order in DGS by choosing the method of a Sentence Reproduction Task. Sentence repetition is a method that is widely used for investigating language skills and serves as a diagnostic test of language abilities especially for children with language impairments. The SRT method has been recently used for testing and reflecting sign language assessment and acquisition. However, this method is less used for the investigation of other grammatical aspects of language so far. In this dissertation, I presented an adaption of a SRT method which investigates word order influences in DGS. The design and structure of the presented study follows a previous SRT on conditionals in DGS (Penzich et al. 2022; Penzich, Herrmann & Steinbach 2019) and presented participants conversations of two deaf signers. These contained a manipulated answer sentence which had to be memorized and reproduced by the participants. The conversations were either presented with verb-final or non-verb-

final order and the critical sentences were varied according to different verb types (plain, forward and backward agreement, spatial and handling verbs) as well as the position of the verb. Hence, the design allowed testing word order preferences in DGS and the influence of verb type on clause structure. This novel task has one great advantage over other common methodologies used in sign language studies such as grammatical judgment tasks or corpus studies described in section 5.1. On the one hand, grammatical judgment tasks might reflect spoken language structure and thus do not represent natural language use. Moreover, judgements tasks showed great variability in signer's judgments in previous studies. On the other hand, corpus studies reflect natural language use but also show a variety of possible orders, which might challenge the question of basic word order. Therefore, the design of the current SRT study was chosen since it allows to elicit data in a controlled way by presenting manipulated stimuli and still measures underlying language structure. This is supported by the fact that participants varied the presented orders, used different dialectal variations of the presented signs, added further manual markings such as the palm-up gesture or the marker PAM and used additional non-manual markings such as squint. This proves that participants did not simply copied the presented stimuli. However, as other controlled experiments, the SRT also had some drawbacks since it does not reflect language use in a natural communication situation. Corpus studies might be more appropriate to show language use in daily communication. Oomen (2020), for instance, recently carried out a corpus study on verb types in DGS. Interestingly, the interaction of verb types and clause structure showed similar results, while the findings of PAM varied. This might be due to different text sorts (dialogues used in the corpus data vs. isolated sentences in the experimental data) and due to a different communication situation (two deaf signers facing and communicating with each other vs. presence of a hearing person in the lab). Furthermore, the variation might be connected to sociolinguistic factors such as dialect, educational background or register. Hence, combining corpus as well as experimental data based on a broad basis of participants, might provide a comprehensive view of the clause structure and the use and function of PAM in DGS.

However, the results presented in this dissertation should be considered with caution since they are biased by i) the criteria of determining word order, ii) the criteria of defining verb types and iii) by the decisions made during the annotation and simplification process for analysis. Firstly, as I discussed in section 3.1.1.1, word order in typological research is usually determined based on the criteria of frequency. Hence, the most common word order is generally be regarded as the basic word order. I followed this view and argued that SOV is the most common and thus basic word order in DGS. If morphological markedness would

be the decisive criterion for defining word order, the order used in clauses with the least morphological marking would be considered the basic word order. In this case, word order used with plain verbs would reflect basic word order since agreement, spatial verbs and classifier predicates would be morphologically more marked and complex compared to plain verbs. This would imply that basic word order in DGS varies between VO and OV order. Secondly, verb type distinction has an influence on the results presented here. I followed the classical tripartite distinction of plain, agreement and spatial verbs. Additionally, I distinguished between forward and backward agreement verbs and further included handling classifier verbs separately. Other attempts which argued for a two-part verb system of plain vs. agreement verbs would have occurred with other results. Thirdly, clause-hood definition and the simplifications during analysis might have biased my results. These concern the definition of clause boundaries as well as the labelling and counting of constituents as described in section 5.5. In particular, I ignored the finer distinction of objects into direct, local or indirect objects and just counted them as O occurrences. In clauses with several objects, I counted the direct object and ignored the other O occurrences similar to the procedure described in Johnston et al. (2007). This process had the advantage that orders could be mainly grouped as SOV, SVO and OSV and other marginal orders. On the other hand, this procedure ignored finer distinctions which might have yielded interesting results. Nevertheless, the chosen procedure turned out as being more useful for this dissertation.

8.3 Implications for future research

This dissertation described word order, in particular, the order of subject, object and verb in a main declarative clause and its interaction with agreement marking. It further empirically examined whether different verb types have an impact on clause structure in DGS. This dissertation thus targets a small part of the broad field of word order research and investigates one specific factor among other possible aspects, which might influence word order and clause structure in general, and in sign languages respectively. Hence, many open questions arose which are worth looking at in future research.

The question of basic word order is usually restricted to the order of subject, object and verb, but word order research comprises the position and order of other elements in the clause such as modal verbs, negative elements and adverbs. Furthermore, word order in other domains such as order within the noun phrase, order in other sentence types and order in embedded clauses compared to main clauses might be of interest. These mentioned aspects

should be further investigated in future to give a comprehensive and general view of clause structure in DGS. The following questions should thus be addressed in future research:

- Does DGS have temporal and aspectual auxiliaries? What is their basic position in the clause?
- What is the position of adverbial expressions?
- What is the basic position of modal verbs and negative elements in the clause?
- Does DGS have subordinating conjunctions? Where do they appear?
- Are there word order differences in main clauses compared to embedded clauses?
- What is the basic word order of other sentence types such as exclamatives and interrogatives?

In addition to the above listed aspects, the factors causing word order variation are still of interest. In chapter 5, I presented the methodology and results of the empirical investigation of verb type influences on word order in DGS and thus, addressed one particular factor. It turned out that, on the one hand, SOV order was most frequently used in the context of all verb types. SVO order, on the other hand, was found with body-anchored plain verbs and agreement verbs that lack an agreement modification. Subsequently, the question arises why especially body-anchored verbs prefer SVO order. Furthermore, the relationship between word order and lack of agreement marking requires further investigation. In general, it would be interesting to know how consistently agreement is marked on the verb in DGS. If agreement marking is missing, it will remain to clarify whether other factors besides word order are used to identify the arguments such as the use of PAM, localization of referents, the occurrence of classifiers or the use of non-manuals. Moreover, gesture research could also be interesting to see whether gestures could serve to identify the arguments of the clause. Though PAM is well-researched in DGS, the distribution and function of PAM should be looked at more closely. Especially, the factors leading to the observed variation regarding the position (preverbal or clause-final position) and the main function (agreement or differential object marker) of PAM need to be addressed in future. However, many studies in sign languages showed that despite verb type, other factors such as the animacy of the arguments and the reversible character of the situation might explain word order variations. The stimuli used in the presented study were not controlled for these aspects. However, the analysis revealed that animacy and reversibility were not decisive for the chosen orders in this dissertation. Nevertheless, these aspects deserve further investigation. Further factors, which should be investigated in future, are the following:

- How does aspect marking influence word order?
- Does the meaning of verbs have an influence on word order?
- How strong is the influence of the figure-ground-relation in locative constructions?
- Is the figure-ground-relation connected to information structure?
- How do word order and information structure interact?

In sum, this dissertation presented the first exhaustive empirical investigation of subject, object and verb position in a main declarative clause in DGS, its interaction with agreement and the influence of verb type on clause structure in DGS. Though it concerns only a small area of the broad field of word order research in general, I hope it contributes to broaden our knowledge of DGS and of sign languages in general.

Appendix

List of stimulus sentences

Context 1:

Morgen feiert meine Freundin Geburtstag. Sie organisiert zu Hause eine Party. Morgen treffen wir ihre Familie. Wir lernen ihren neuen Freund kennen. Meine Freunde und ich, wir haben uns zusammen ein Geschenk überlegt.

verb-final: MORGEN POSS₁ FREUNDIN IX_{3a} GEBURTSTAG FEIER. IX_{3a} PARTY IX_{loc} ZU-HAUSE ORGANISIER. MORGEN IX_{1pl} POSS_{3a} FAMILIE TREFF. IX_{1pl} AUCH POSS_{3a} NEU FREUND KENNENLERN. POSS₁ FREUND++ IX₁ IX_{1pl} ZUSAMMEN GESCHENK ÜBERLEG.

non-verb-final: MORGEN POSS₁ FREUNDIN IX_{3a} FEIER GEBURTSTAG. IX_{3a} ORGANISIER PARTY IX_{loc} ZU-HAUSE. MORGEN IX_{1pl} TREFF POSS_{3a} FAMILIE. IX_{1pl} KENNENLERN AUCH POSS_{3a} NEU FREUND. POSS₁ FREUND++ IX₁ ÜBERLEG ZUSAMMEN GESCHENK.

a. Plain verb

Signer A: INHALT WAS

Signer B:

verb-final: POSS₁ FREUNDIN IX_{3a} OFT WALD AB WANDER

non-verb-final: POSS₁ FREUNDIN IX_{3a} WANDER OFT WALD AB

„Meine Freundin geht oft im Wald wandern.“

b. Forward agreement verb

Signer A: INHALT WAS

Signer B:

verb-final: IX_{1pl} POSS₁ FREUNDIN IX_{3a} GEMEINSAM AUSFLUG ₁SCHENK_{3a}

non-verb-final: IX_{1pl} ₁SCHENK_{3a} POSS₁ FREUNDIN IX_{3a} GEMEINSAM AUSFLUG

„Wir schenken meiner Freundin einen gemeinsamen Ausflug.“

c. Spatial verb

Signer A: ACHSO. UND DANN

Signer B:

verb-final: DA EINIGE FREUND++ ZUSAMMEN IX_{loc} PARTY FAHR_{CL}

non-verb-final: DA EINIGE FREUND++ ZUSAMMEN FAHR_{CL} IX_{loc} PARTY

„Einige Freunde fahren zusammen zur Party.“

d. Handling verb

Signer A: ACHSO. WAS DANN

Signer B:

verb-final: POSS₁ FREUND++ ALLE SCHWARZ HUT ANZIEH_{CL}

non-verb-final: POSS₁ FREUND++ ANZIEH_{CL} ALLE SCHWARZ HUT

„Meine Freunde ziehen alle einen schwarzen Hut an.“

e. Backward agreement verb

Signer A: JA

Signer B:

verb-final: POSS₁ FREUNDIN_{3b} IX_{3a} POSS₁ EX-FREUND AUCH _{3a}EINLAD_{3b}non-verb-final: POSS₁ FREUNDIN_{3b} AUCH _{3a}EINLAD_{3b} IX_{3a} POSS₁ EX-FREUND

„Meine Freundin lädt auch meinen Exfreund ein.“

Context 2:

Nächste Woche schreiben wir die Abschlussprüfungen. Seit Wochen lernen die Studenten viel Neues. Wir Studenten haben eine Lerngruppe gegründet. Wir treffen uns regelmäßig. Dann schreiben wir die wichtigen Inhalte auf.

verb-final: NÄCHSTE WOCHEN IX_{1pl} ABSCHLUSS#PRÜFUNG SCHREIB. VIELE WOCHEN BISHER STUDIER#PERSON++ VIEL NEU++ LERN++. IX_{3a} STUDIER#PERSON++ IX_{1pl} EIN LERN#GRUPPE GRÜND. IX_{1pl} REGELMÄSSIG TREFF++. DANN IX_{1pl} WICHTIG INHALT++ SCHREIB.

non-verb-final: NÄCHSTE WOCHEN IX_{1pl} SCHREIB ABSCHLUSS#PRÜFUNG. VIELE WOCHEN BISHER STUDIER#PERSON++ LERN++ VIEL NEU++. IX_{3a} STUDIER#PERSON++ IX_{1pl} GRÜND EIN LERN#GRUPPE. IX_{1pl} TREFF REGELMÄSSIG. DANN IX_{1pl} SCHREIB WICHTIG INHALT.

a. Plain verb

Signer A: INHALT WAS

Signer B:

verb-final: LEHRER IX_{3a} REGELMÄSSIG WICHTIG INHALT WIEDERHOLnon-verb-final: LEHRER IX_{3a} WIEDERHOL REGELMÄSSIG WICHTIG INHALT

„Der Lehrer wiederholt regelmäßig die wichtigen Inhalte.“

b. Forward agreement verb

Signer A: INHALT WAS

Signer B:

verb-final: LEHR#PERSON_{3a} IX_{3b} STUDIER#PERSON_{3b}++ THEMA NOCHMAL _{3a}ERKLÄR_{3b}++non-verb-final: LEHR#PERSON_{3a} _{3a}ERKLÄR_{3b}++ IX_{3b} STUDIER#PERSON_{3b}++ THEMA NOCHMAL

„Der Lehrer erklärt den Studenten das Thema noch einmal.“

c. Spatial verb

Signer A: OK

Signer B:

verb-final: IX_{loc} UNIVERSITÄT#BIBLIOTHEK POSS_{1pl} WICHTIG BUCH++ DA STEH_{cl}.non-verb-final: IX_{loc} UNIVERSITÄT#BIBLIOTHEK DA STEH_{cl} POSS_{1pl} WICHTIG BUCH++

„Unsere wichtigen Bücher stehen in der Universitätsbibliothek.“

d. Handling verb

Signer A: ACHSO. UND DANN

Signer B:

verb-final: SPÄTER IX_{1pl} ALLE NOTIZ#ZETTEL IX_{loc} EIMER WERF_{cl}.non-verb-final: SPÄTER IX_{1pl} WERF ALLE NOTIZ#ZETTEL IX_{loc} EIMER_{cl}.

„Später werfen wir alle Notizen in den Mülleimer.“

e. Backward agreement verb

Signer A: WAS PASSIER DANN

Signer B:

verb-final: SPÄTER STUDIER#PERSON_{3a}++ POSS_{3pl} ABSCHLUSS#NOTE _{3b}ABHOLnon-verb-final: SPÄTER STUDIER#PERSON_{3a}++ _{3b}ABHOL POSS_{3pl} ABSCHLUSS#NOTE

„Später holen die Studenten ihre Abschlussnote ab.“

Context 3:

Seit einem halben Jahr habe ich einen neuen Nebenjob angefangen. Ich passe zu Hause auf die Kinder meiner Nachbarin auf. Beide Eltern arbeiten nachmittags. Die Kinder und ich, wir spielen immer zusammen. Manchmal passe ich auch abends auf die Kinder auf.

verb-final: SEIT HALB JAHR BISHIER IX₁ ARBEIT NEU BEKOMM. NACHBAR POSS_{3a} KIND++ IX_{1oc} ZU-HAUSE IX₁ AUFPASS. NACH#MITTAG BEIDE ELTERN AB ARBEIT. IX₁ KIND++ ZUSAMMEN SPIEL. ABEND MANCHMAL AUCH IX₁ KIND++ AUFPASS.

non-verb-final: SEIT HALB JAHR BISHIER IX₁ BEKOMM NEU ARBEIT. NACHBAR POSS_{3a} KIND++ IX₁ AUFPASS IX_{1oc} ZU-HAUSE. NACH#MITTAG ARBEIT BEIDE ELTERN AB. IX₁ KIND++ SPIEL ZUSAMMEN. ABEND MANCHMAL AUCH IX₁ AUFPASS KIND++.

a. Plain verb

Signer A: UND DANN

Signer B:

verb-final: IX_{3a} MÄDCHEN POSS_{3a} SCHÖN PUPPE LIEBnon-verb-final: IX_{3a} MÄDCHEN LIEB POSS_{3a} SCHÖN PUPPE

„Das Mädchen liebt ihre schöne Puppe.“

b. Forward agreement verb

Signer A: STIMMT. UND DANN

Signer B:

verb-final: IX_{3a} MUTTER_{3a} OFT KIND_{3b}++ _{3a}BESCHEID-SAG_{3b}non-verb-final: IX_{3a} MUTTER_{3a} _{3a}BESCHEID-SAG_{3b} KIND_{3b}++ OFT

„Die Mutter informiert jedes Mal ihre Kinder.“

c. Spatial verb

Signer A: ACHSO. WAS DANN

Signer B:

verb-final: ABEND DANN KIND++ POSS_{3pl} BETT LIEG_{cl}.non-verb-final: ABEND DANN KIND++ LIEG_{cl} POSS_{3pl} BETT

„Abends liegen die Kinder dann in ihren Betten.“

d. Handling verb

Signer A: ACHSO. UND DANN

Signer B:

verb-final: ABEND MUTTER IX_{loc} TÜR ZUSCHLIESS_{cl}.non-verb-final: ABEND MUTTER ZUSCHLIESS_{cl} IX_{loc} TÜR

„Abends schließt die Mutter die Tür unten ab.“

e. Backward agreement verb

Signer A: JA

Signer B:

verb-final: HEUTE ABEND MUTTER_{3a} POSS_{3a} MANN_{3b} ABHOL_{3a}non-verb-final: HEUTE ABEND MUTTER_{3a} ABHOL_{3a} POSS_{3a} MANN_{3b}

„Heute Abend holt die Mutter ihren Mann ab.“

Context 4:

Letzten Monat hat mein Vater ein neues Jobangebot bekommen. Meine Eltern sind daher in eine andere Stadt gezogen. Wir haben ein Haus gekauft. Wir haben das Haus lange renoviert. Jetzt gestalten wir den Garten neu.

verb-final: LETZTEN MONAT POSS₁ VATER NEU ARBEIT BEKOMM. DESHALB POSS₁ ELTERN IX_{1oc} ANDERE STADT UMZIEH. IX_{1oc} IX_{1pl} HAUS KAUF. IX_{1oc} HAUS IX_{1pl} LANG RENOVIER. JETZT IX_{1oc} GARTEN NEU GESTALT.

non-verb-final: LETZTEN MONAT POSS₁ VATER BEKOMM NEU ARBEIT. DESHALB POSS₁ ELTERN UMZIEH IX_{1oc} ANDERE STADT. IX_{1oc} IX_{1pl} KAUF HAUS. IX_{1oc} HAUS IX_{1pl} RENOVIER LANG. JETZT GESTALT IX_{1oc} GARTEN NEU.

a. Plain verb

Signer A: STIMMT. UND DANN

Signer B:

verb-final: POSS₁ ELTERN IX_{3a} SCHÖN BLUMEN++ AUSWÄHL++non-verb-final: POSS₁ ELTERN IX_{3a} AUSWÄHL++ SCHÖN BLUMEN++

„Meine Eltern haben schöne Blumen ausgewählt.“

b. Forward agreement verb

Signer A: UND DANN

Signer B:

verb-final: POSS₁ VATER_{3b} IX_{3a} OMA_{3a} GARTEN_{3b} ZEIG_{3a}non-verb-final: POSS₁ VATER_{3b} ZEIG_{3a} IX_{3a} OMA_{3a} GARTEN

„Mein Vater zeigt Oma den Garten.“

c. Spatial verb

Signer A: OK

Signer B:

verb-final: IX_{loc} GARTEN SPÄTER FAMILIE ZUSAMMEN SITZ_{CL}non-verb-final: IX_{loc} GARTEN SPÄTER SITZ_{CL} FAMILIE ZUSAMMEN

„Zukünftig sitzt die Familie zusammen im Garten.“

d. Handling verb

Signer A: WAS PASSIER DANN

Signer B:

POSS₁ ELTERN IX_{loc} ALT BUSCH++ AUSGRAB_{CL}POSS₁ ELTERN AUSGRAB_{CL} IX_{loc} ALT BUSCH++

„Meine Eltern graben alte Büsche aus.“

e. Backward agreement verb

Signer A: JA

Signer B:

verb-final: NEU NACHBAR_{3a} IX_{3b} POSS₁ FAMILIE _{3b}AKZEPTIERnon-verb-final: NEU NACHBAR_{3a} _{3b}AKZEPTIER IX_{3b} POSS₁ FAMILIE

„Der neue Nachbar akzeptiert meine Familie.“

Context 5:

Nächste Woche feiern wir Weihnachten. Dann sehen wir die gesamte Familie wieder. Normalerweise besuchen wir Oma. Oma bereitet das Essen zu. Opa kauft auch viele Geschenke.

verb-final: NÄCHSTE WOCHE IX_{1pl} WEIHNACHT FEIER. DANN GESAMTE FAMILIE WIEDERSEH. NORMAL IX_{1pl} OMA_{3a} ₁BESUCH_{3a}. IX_{3a} OMA ESSEN ZUBEREIT. OPA AUCH VIELE GESCHENK++ KAUF++.

non-verb-final: NÄCHSTE WOCHE IX_{1pl} FEIER WEIHNACHT. DANN WIEDERSEH GESAMTE FAMILIE. NORMAL IX_{1pl} ₁BESUCH_{3a} OMA_{3a}. IX_{3a} OMA ZUBEREIT ESSEN. OPA KAUF++ AUCH VIELE GESCHENK++.

a. Plain verb

Signer A: OK

Signer B:

verb-final: LETZTES JAHR POSS₁ OMA IX_{loc} KRANKENHAUS STERBnon-verb-final: LETZTES JAHR POSS₁ OMA STERB IX_{loc} KRANKENHAUS

„Letztes Jahr ist meine Oma im Krankenhaus gestorben.“

b. Forward agreement verb

Signer A: WIE WEITER

Signer B:

verb-final: POSS₁ MUTTER_{3a} IX_{3b} OMA PLUS OPA_{3b} _{3a}HELF_{3b}non-verb-final: POSS₁ MUTTER_{3a} _{3a}HELF_{3b} IX_{3b} OMA PLUS OPA_{3b}

„Meine Mutter hilft meinen Großeltern.“

c. Spatial verb

Signer A: ACHSO. WAS DANN

Signer B:

verb-final: TANNENBAUM IX_{loc} KIND++ BUNT KUGEL++ HÄNG_{cl}++non-verb-final: TANNENBAUM IX_{loc} KIND++ HÄNG_{cl}++ BUNT KUGEL++

„Die Kinder hängen bunte Kugeln an den Baum.“

d. Handling verb

Signer A: STIMMT. UND DANN

Signer B:

verb-final: POSS₁ OPA VIELE GROSS GESCHENK TRAG_{cl}++non-verb-final: POSS₁ OPA TRAG_{cl}++ VIELE GROSS GESCHENK

„Mein Opa trägt viele große Geschenke.“

e. Backward agreement verb

Signer A: ACHSO. UND DANN

Signer B:

verb-final: IX_{dem} JAHR POSS₁ OMA PLUS OPA_{3a} AUCH FREUND_{3b}++ 3bEINLAD_{3a}++

non-verb-final: IX_{dem} JAHR POSS₁ OMA PLUS OPA_{3a} 3bEINLAD_{3a}++ AUCH FREUND_{3b}+++

„Dieses Jahr haben meine Großeltern auch Freunde eingeladen.“

Context 6:

Letztes Jahr ist eine Wirtschaftskrise eingetreten. Unsere Firma hat Aufträge verloren. Deshalb strukturiert der Vorstand die Firma neu. Es wechseln viele Mitarbeiter. Einige Kollegen warten noch auf Post.

verb-final: LETZTES JAHR WIRTSCHAFT#KRISE PASSIER. POSS_{1pl} FIRMA VIELE AUFTRAG++
VERLIER. DESHALB VORSTAND VIEL UMWANDEL++. FIRMA IX_{loc} VIELE MIT#ARBEIT
PERSON++ WECHSEL++. EINIGE IX_{3a}++ KOLLEGE++ PAM BRIEF WART.

non-verb-final: LETZTES JAHR PASSIER WIRTSCHAFT#KRISE. POSS_{1pl} FIRMA VERLIER VIELE
AUFTRAG++. DESHALB VORSTAND UMWANDEL VIEL. FIRMA IX_{loc} WECHSEL++ VIELE
MIT#ARBEIT PERSON++. EINIGE IX_{3a}++ KOLLEGE++ WART PAM BRIEF.

a. Plain verb

Signer A: STIMMT. UND DANN

Signer B:

verb-final: POSS₁ KOLLEGE IX_{3a} NEU ARBEIT SUCH

non-verb-final: POSS₁ KOLLEGE IX_{3a} SUCH NEU ARBEIT

„Mein Kollege sucht eine neue Arbeit.“

b. Forward agreement verb

Signer A: ACHSO. WAS DANN

Signer B:

verb-final: POSS₁ MANN IX_{3b} VIELE VERSCHIEDEN BEWERBUNG _{3b}SCHICK_{3a}++non-verb-final: POSS₁ MANN IX_{3b} _{3b}SCHICK_{3a}++ VIELE VERSCHIEDEN BEWERBUNG

„Mein Mann verschickt viele verschiedene Bewerbungen.“

c. Spatial verb

Signer A: UND DANN

Signer B:

verb-final: IX_{1pl} CHEF POSS_{3a} BÜRO GEH_{CL}non-verb-final: IX_{1pl} GEH_{CL} CHEF POSS_{3a} BÜRO

„Wir gehen in das Büro vom Chef.“

d. Handling verb

Signer A: INHALT WAS

Signer B:

verb-final: POSS₁ TOCHTER IX_{3a} JETZT BRIEF ÖFFN_{CL}non-verb-final: POSS₁ TOCHTER IX_{3a} JETZT ÖFFN_{CL} BRIEF

„Meine Tochter öffnet jetzt den Umschlag.“

e. Backward agreement verb

Signer A: WIE WEITER

Signer B:

verb-final: NEU MIT#ARBEIT PERSON_{3b}++ IX_{3a} POSS_{1pl} CHEF _{3a}AKZEPTIERnon-verb-final: NEU MIT#ARBEIT PERSON_{3b}++ _{3a}AKZEPTIER IX_{3a} POSS_{1pl} CHEF

„Die neuen Mitarbeiter akzeptieren unseren Chef.“

Context 7: Morgen tauft der Pfarrer unseren kleinen Sohn. Die Familie nimmt gemeinsam am Gottesdienst teil. Danach feiern wir zu Hause. Das Essen haben wir heute gekocht. Wir haben auch schon Getränke gekauft.

verb-final: MORGEN PFARRER IX_{3a} POSS_{1pl} KLEIN SOHN TAUF. FAMILIE GEMEINSAM KIRCHE HINEIN. DANACH IX_{1pl} ZU-HAUSE IX_{loc} FEIER. HEUTE IX_{1pl} ESSEN KOCH. AUCH SCHON GETRÄNK KAUF++.

non-verb-final: MORGEN PFARRER IX_{3a} TAUF POSS_{1pl} KLEIN SOHN. FAMILIE GEMEINSAM HINEIN KIRCHE. DANACH IX_{1pl} FEIER ZU-HAUSE IX_{loc}. HEUTE IX_{1pl} KOCH ESSEN. AUCH SCHON KAUF++ GETRÄNK.

a. Plain verb

Signer A: ACHSO. UND DANN

Signer B:

verb-final: KUCHEN LEIDER IX_{loc} OFEN BRENNnon-verb-final: KUCHEN BRENN LEIDER IX_{loc} OFEN

„Ein Kuchen ist leider im Ofen angebrannt.“

b. Forward agreement verb

Signer A: JA

Signer B:

verb-final: VOR DREI-MONAT IX_{1pl} IX_{3a} PFARRER ₁FRAG_{3a}non-verb-final: VOR DREI-MONAT IX_{1pl} ₁FRAG_{3a} IX_{3a} PFARRER

„Vor drei Monaten hatten wir den Pfarrer gefragt.“

c. Spatial verb

Signer A: WIE WEITER

Signer B:

verb-final: JETZT IX_{1pl} TISCH GLAS++ STELL_{cl}++non-verb-final: JETZT IX_{1pl} TISCH STELL_{cl} GLAS++

„Jetzt stellen wir die Gläser auf den Tisch.“

d. Handling verb

Signer A: WAS PASSIER DANN

Signer B:

verb-final: MORGEN PFARRER IX_{loc} BECKEN WASSER GIESS_{cl}non-verb-final: MORGEN PFARRER GIESS_{cl} WASSER IX_{loc} BECKEN

„Morgen gießt der Pfarrer das Wasser ins Taufbecken.“

e. Backward agreement verb

Signer A: WIE WEITER

Signer B:

verb-final: HEUTE POSS₁ FRAU_{3a} KUCHEN_{3b} 3bNEHM_{3a}non-verb-final: HEUTE POSS₁ FRAU_{3a} 3bNEHM_{3a} KUCHEN_{3b}

„Meine Frau nimmt heute ein Kuchenstück.“

Context 8: Gestern haben die Schulferien angefangen. Die Familie macht zwei Wochen Urlaub. Sie fahren mit dem Auto ans Meer. Die Kinder mögen das Meer. Sie schlafen in einer Ferienwohnung.

verb-final: GESTERN SCHUL#FERIEN ANFANG. FAMILIE IX_{3a} ZWEI WOCHEN URLAUB. IX_{loc} NORD#SEE FAHR. KIND++ MEER MÖG. IX_{3a} IX_{loc} FERIEN#WOHNUNG SCHLAF.

non-verb-final: GESTERN ANFANG SCHUL#FERIEN. FAMILIE IX_{3a} ZWEI WOCHEN URLAUB. FAHR IX_{loc} NORD#SEE. KIND++ MÖG MEER. IX_{3a} SCHLAF IX_{loc} FERIEN#WOHNUNG.

a. Plain verb

Signer A: UND DANN

Signer B:

verb-final: KLEIN MÄDCHEN OFT IX_{loc} AUTO WEINnon-verb-final: KLEIN MÄDCHEN WEIN OFT IX_{loc} AUTO

„Das kleine Mädchen weint oft im Auto.“

b. Forward agreement verb

Signer A: WAS PASSIER DANN

Signer B:

verb-final: IX_{3a} JUNGE POSS_{3a} SCHWESTER_{3b} IMMER _{3a}ÄRGER_{3b}non-verb-final: IX_{3a} JUNGE _{3a}ÄRGER_{3b} IMMER POSS_{3a} SCHWESTER_{3b}

„Der Junge ärgert immer seine Schwester.“

c. Spatial verb

Signer A: WIE WEITER

Signer B:

verb-final: IX_{3a} VATER SCHWER KOFFER IX_{loc} AUTO HEB_{CL}non-verb-final: IX_{3a} VATER HEB_{CL} SCHWER KOFFER IX_{loc} AUTO

„Der Vater hebt die schweren Koffer ins Auto.“

d. Handling verb

Signer A: ACHSO. WAS DANN

Signer B:

verb-final: JEDEN ABEND IX_{3a} ELTERN LECKER FISCH ESSnon-verb-final: JEDEN ABEND IX_{3a} ELTERN ESS LECKER FISCH

„Die Eltern essen jeden Abend leckeren Fisch.“

e. Backward agreement verb

Signer A: OK

Signer B:

verb-final: JETZT IX_{3a} MUTTER_{3a} AUTO#SCHLÜSSEL_{3b} 3bNEHM_{3a}

non-verb-final: JETZT IX_{3a} MUTTER_{3a} 3bNEHM_{3a} AUTO#SCHLÜSSEL_{3b}

„Jetzt nimmt die Mutter die Autoschlüssel.“

Exercises

Exercise context 1: Gestern Abend haben meine Zahnschmerzen angefangen. Heute Morgen habe ich einen Termin beim Arzt vereinbart. Jetzt sitzen wir im Wartezimmer. Der Arzt ruft meinen Namen. Dann folgen wir dem Arzt.

verb-final: GESTERN ABEND POSS₁ ZAHN#SCHMERZ ANFANG. HEUTE MORGEN ARZT#TERMIN VEREINBAR. JETZT IX_{1pl} IX_{loc} WART#ZIMMER SITZ. ARZT IX_{3a} POSS₁ NAME RUF PAM. DANN IX_{1pl} ARZT FOLG.

non-verb-final: GESTERN ABEND ANFANG POSS₁ ZAHN#SCHMERZ. HEUTE MORGEN VEREINBAR ARZT#TERMIN. JETZT IX_{1pl} SITZ IX_{loc} WART#ZIMMER. ARZT RUF PAM POSS₁ NAME. DANN IX_{1pl} FOLG ARZT.

Signer A: WAS PASSIER

Signer B:

verb-final: IX_{3a} ARZT POSS₁ ZAHN VORSICHTIG UNTERSUCH

non-verb-final: IX_{3a} ARZT VORSICHTIG UNTERSUCH POSS₁ ZAHN

„Der Arzt untersucht vorsichtig meinen Zahn.“

Exercise context 2: Heute Morgen betritt die Lehrerin das Klassenzimmer. Alle Schüler reden durcheinander. Die Lehrerin verteilt unterschiedliche Zettel. Dann schreiben die Kinder einen Test. Aber ein Schüler hat seinen Bus verpasst.

verb-final: HEUTE MORGEN LEHR#PERSON IX_{loc} KLASSE#ZIMMER KOMM. ALLE SCHUL#PERSON++ DURCHEINANDER RED++. LEHR#PERSON IX_{3a} VERSCHIEDEN ZETTEL AUSTEIL++. DANN KIND++ TEST SCHREIB. ABER EIN SCHUL#PERSON POSS_{3a} BUS VERPASS.

non-verb-final: HEUTE MORGEN LEHR#PERSON KOMM IX_{loc} KLASSE#ZIMMER. ALLE SCHUL#PERSON++ RED DURCHEINANDER. LEHR#PERSON IX_{3a} AUSTEIL++ VERSCHIEDEN ZETTEL. DANN KIND++ SCHREIB TEST. ABER EIN SCHUL#PERSON VERPASS POSS_{3a} BUS.

Signer A: WAS DANN

Signer B:

verb-final: HEUTE MORGEN SCHUL#PERSON ZU-SPÄT KOMM

non-verb-final: HEUTE MORGEN SCHUL#PERSON KOMM ZU-SPÄT

„Der Schüler kommt heute Morgen zu spät.“

Stimulus verbs

Plain verbs: CRY, DIE, BURN, HIKE, LOOK-FOR, REPEAT, LOVE, CHOOSE



Figure 58: Verb CRY

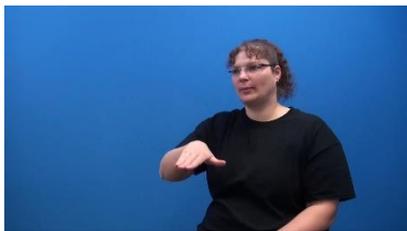


Figure 59: Verb DIE



Figure 60: Verb BURN



Figure 61: Verb HIKE



Figure 62: Verb LOOK-FOR



Figure 63: Verb REPEAT



Figure 64: Verb LOVE



Figure 65: Verb CHOOSE

Forward agreement verbs: INFORM, EXPLAIN, ASK, GIVE-AS-A-PRESENT, HELP, SEND, SHOW, TEASE



Figure 66: Verb INFORM

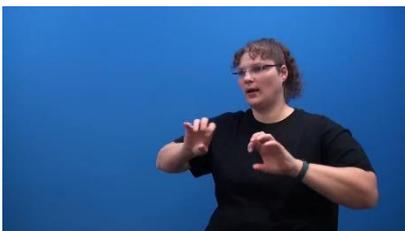


Figure 67: Verb EXPLAIN

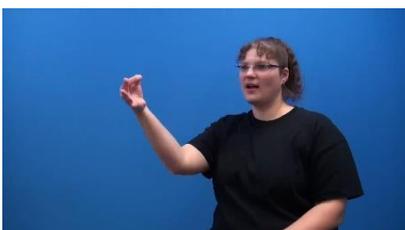


Figure 68: Verb ASK



Figure 69: Verb GIVE-AS-A-PRESENT



Figure 70: Verb HELP

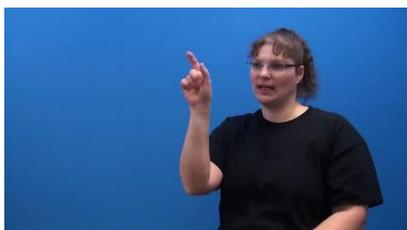


Figure 71: Verb SEND



Figure 72: Verb SHOW



Figure 73: Verb TEASE

Backward agreement verbs: PICK-UP, INVITE, TAKE, ACCEPT

Figure 74: Verb PICK-UP

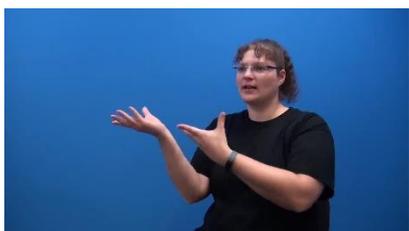


Figure 75: Verb INVITE



Figure 76: Verb TAKE



Figure 77: Verb ACCEPT

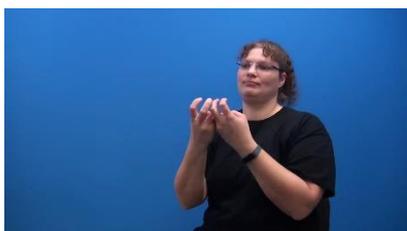
Spatial verbs: SIT, STAND, LIE, PUT, HANG, LIFT, DRIVE, GO

Figure 78: Verb SIT

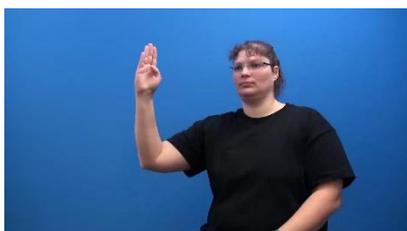


Figure 79: Verb STAND



Figure 80: Verb LIE



Figure 81: Verb PUT

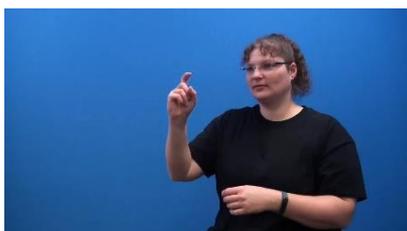


Figure 82: Verb HANG



Figure 83: Verb LIFT



Figure 84: Verb DRIVE

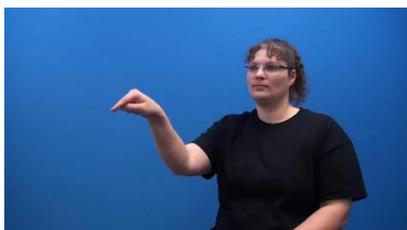


Figure 85: Verb GO

Handling verbs: EAT, WEAR, CLOSE, OPEN, CARRY, POUR, DIG-OUT, THROW

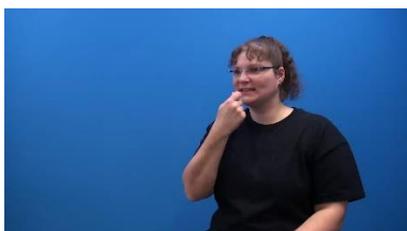


Figure 86: Verb EAT

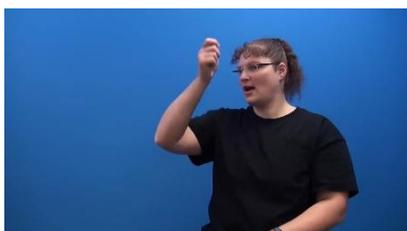


Figure 87: Verb WEAR



Figure 88: Verb CLOSE



Figure 89: Verb OPEN

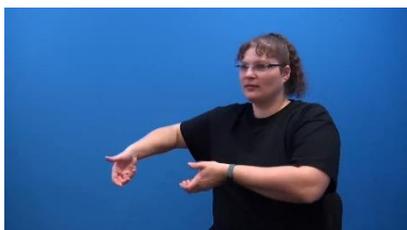


Figure 90: Verb CARRY



Figure 91: Verb POUR

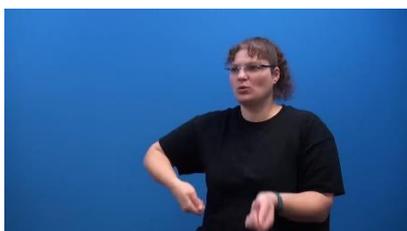


Figure 92: Verb DIG-OUT



Figure 93: Verb THROW

Filler questions

- Question 1: POSS_{3b} FREUNDIN BALD GEBURTSTAG
 „Hat ihre Freundin bald Geburtstag?“
- Question 2: NÄCHSTE WOCHE SCHUL#PERSON++ FERIEN DA
 „Haben die Schüler nächste Woche Ferien?“
- Question 3: IX_{dem} PERSON OHNE NEBEN#JOB DA
 „Hat diese Person keinen Nebenjob?“
- Question 4: POSS_{3b} ELTERN NEU HAUS DA
 „Haben ihre Eltern ein neues Haus?“
- Question 5: NÄCHSTE WEIHNACHTEN IX_{dem} PERSON ALLEIN
 „Ist diese Person nächstes Weihnachten alleine?“
- Question 6: LETZTES JAHR WIRTSCHAFT#KRISE DA
 „Gab es letztes Jahr eine Wirtschaftskrise?“
- Question 7: KLEIN SOHN IX_{3a} MORGEN TAUF
 „Wird der kleine Sohn morgen getauft?“

Question 8: FAMILIE IX_{3b} URLAUB BERGE IX_{10c}

„Macht die Familie Urlaub in den Bergen?“

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Eidesstattliche Erklärung

Hiermit versichere ich an Eides statt, dass ich die eingereichte Dissertation selbständig verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt habe. Alle Ausführungen, die anderen Schriften wörtlich oder sinngemäß entnommen wurden, habe ich kenntlich gemacht. Die Abhandlung in dieser oder ähnlicher Form wurde noch nicht veröffentlicht oder anderweitig als Promotionsleistung vorgelegt und bewertet.

Baunatal, 04.12.2020