

Argument structure in three sign languages: typological and theoretical aspects

1. Project Information

Sign language typology is a young research field with two related goals. First, sign languages (SLs) are compared to spoken languages with respect to certain grammatical features to scrutinize which typological distinctions are valid across modalities and to determine whether theoretical accounts that are based on spoken language data can be applied to SLs. Second, SLs are compared to each other to further investigate whether they differ along similar lines as spoken languages do. In this project, both types of typological comparison are applied to the area of argument structure (AS).

Verbs in all natural languages must be specified for how many participants they require (subject, (in)direct object); compare e.g. *Peter laughed* with the ungrammatical *Peter visited*. Interestingly, a given verb may be variable with respect to its AS; compare *Peter broke the window* to *The window broke*. In addition, there are syntactic and morphological means to change AS, e.g. in a passive construction (e.g. *He was visited*). We will refer to the first type of behavior as **AS-alternation**, and to the latter as **AS-change**.

While AS, AS-alternations, and AS-changes are well studied for spoken languages, very little is known about what verb classes exist in SLs and whether SLs employ systematic AS-changing strategies. This project sets out to fill this gap by providing the first cross-linguistic study on AS in SLs. In three sub-projects, we will study AS in three unrelated SLs, by means of corpus analysis and data elicitation, to (i) provide a cross-modal and intra-modal typological comparison and (ii) to evaluate the applicability of existing theoretical accounts to SLs.

2. PIs

- Dr. Roland Pfau
- Prof. Dr. Enoch O. Aboh
- Address for correspondence: Department of General Linguistics, University of Amsterdam, Spuistraat 210, 1012 VT Amsterdam
- r.pfau@uva.nl; e.o.aboh@uva.nl

3. Period of Funding

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4. Structure of the Proposed Research

SUBPROJECT 1: PhD student.

Project title: Argument structure in Sign Language of the Netherlands

ACLC, UvA. Supervisors: Prof. Enoch O. Aboh & Dr. Roland Pfau

SUBPROJECT 2: PhD student.

Project title: Argument structure in German Sign Language

ACLC, UvA. Supervisors: Prof. Enoch O. Aboh & Dr. Roland Pfau

SUBPROJECT 3: Postdoc Researcher: Vadim Kimmelman.

Project title: A comparative study of argument structure in sign languages: Typological and theoretical implications

ACLC, UvA. Supervisor: Dr. Roland Pfau

5. Description of the Project

This 4-year project, which will involve two PhD students and a postdoc researcher, will yield the first comprehensive overview of argument structure (AS), AS-alternations, and AS-changes in sign languages (SLs), as compared to spoken languages. The theoretical motivation is to test existing theories of AS-structure couched within the Generative Grammar framework on the data from SLs. The project will address the question whether AS is represented in the lexicon or in syntax.

Three SLs will be analyzed, namely Sign Language of the Netherlands (NGT – PhD-1), German Sign Language (DGS – PhD-2), and Russian Sign Language (RSL – postdoc). These SLs are not historically related; however, the spoken languages that are in contact with DGS and NGT, German and Dutch, are closely related. Therefore, a comparison with RSL (which is in contact with Russian, a typologically different language) can help us in identifying possible contact phenomena. Crucially, while studies on certain linguistic aspects of all three SLs are available, their AS has not been investigated at all. Finally, all three SLs have a recently created corpus that can be used for the research, which makes the proposed research especially timely.

The project has three related goals:

Goal-I: description of AS for each SL;

Goal-II: evaluation of competing theoretical accounts in light of the data; and

Goal-III: development of methodological tools that will be of use in future studies.

Only Goal-II is tied to a particular theoretical framework. Goal-I and Goal-III are theory-independent, and the results related to these goals are thus of interest to all linguists working on AS, irrespective of their theoretical orientation.

GOAL-I: Description of AS for each SL

1. Argument structure in spoken languages

In all natural languages, verbs can be classified according to how many arguments they take, i.e. with respect to their valency (Givón 2001; Ramchand, to appear). For instance, languages generally distinguish transitive (*The girl hits the boy*) and intransitive (*The girl sleeps* (**the boy*)) verbs.

Although the AS of a verb is connected to its semantics, languages may differ with respect to how they lexicalize different aspects of the situation (Levin & Rappaport Hovav 2005). For instance, while *enter* in English has a direct object (e.g. *room* in *I entered the room*), in Russian the same argument is expressed by a prepositional phrase (*Ja vošol v komnatu*, lit: ‘I entered in room’). Therefore, for every language – be it spoken or signed – verb classes with respect to AS should be empirically identified.

In addition, verbs are often flexible with respect to arguments that they take. For example, in English, *break* can be used transitively (*John broke a window*), or intransitively (*The window broke*). This is known as **AS-alternation**, and the most common patterns are causative-inchoative alternation (as above), dative alternation (*John gave Mary a book* vs. *John gave a book to Mary*), and locative alternation (*John smothered the toast with butter* vs. *John smothered butter on the toast*). Finding a systematic explanation for variability patterns is another aim of this field of research.

Furthermore, a language may also employ morphological or syntactic strategies to change the AS of verbs. For instance, the English verb *cut* is transitive (*The girl cuts the ribbon*). However, when used in a *passive* construction, its object *ribbon* is promoted to the status of subject and the subject becomes demoted (*The ribbon was cut [by the girl]*); this change is marked by a syntactic strategy, the use of the auxiliary *be*. In contrast, in Turkish, passivization is marked by a morphological strategy, the suffix *-il*; adding this suffix e.g. to the verb *keşfetmek* (‘to discover’) yields the passive form *keşfedilmek* (‘to be discovered’) (Kornfilt 1997). We refer to these types of modifications as **AS-changes**.

Further AS-changing constructions include (i) the *causative* construction (introducing a direct object: ‘to make someone do something’; Comrie & Polinsky 1993), (ii) the *applicative/benefactive* construction (introducing an indirect object: ‘to do something for someone’; Pylkkänen 2008), and (iii) the *reflexive/reciprocal* construction (which may suppress the direct object; Nedjalkov 2007). Strategies used for the realization of AS-changes include affixes, stem-internal changes, pronouns, auxiliaries, and prepositional phrases.

Note that, even within a language, the same semantic relations, such as causative-inchoative relation, are sometimes expressed by the same verb with flexible AS (*break*), and sometimes by a morphological or syntactic strategy (causative construction: *run* – *make run*). Therefore, it is necessary to study both AS-alternations and AS-changing strategies to understand the system of AS in a language.

2. Argument structure in SLs

In the past decades, numerous aspects of linguistic structure have received considerable attention in the SL literature (Pfau, Steinbach & Woll 2012). Studies have demonstrated that research on SLs is valuable both for linguistic typology (Zeshan 2006; Pfau 2012) and the theoretical study of language (Sandler & Lillo-Martin 2006). However, AS is still seriously understudied.

Very few studies directly address AS and AS-alternations in SLs. Kegl (1990) distinguished verb classes in American SL (ASL) according to their AS and also discussed AS-alternations. She found that ASL and English share most of the AS-classes (e.g. different types of intransitives, transitives, and ditransitives) and -alternations. Surprisingly, such basic description of AS is available for almost no other SL (see Leeson 2002). There are, however, some studies that focus on AS-changing syntactic and morphological strategies.

Several authors (Janzen, O'Shea & Shaffer 2001; Leeson 2002; Sze 2008) have raised the question whether SLs have *passives*. Janzen et al. (2001:292) argue that ASL has non-promotional passives, whereby the agent is not expressed but the patient is still the object; there is no morphological marking of passives. Sze (2008) shows that the former also holds in Hong Kong SL (HKSL), but claims that passivization is marked morphologically by reduction of the verb's movement.

Tang & Yang (2007) investigate *causatives* in HKSL and observe that events of causation are either expressed by a single predicate (e.g. BREAK-A-CYLINDRICAL-OBJECT '[he] breaks [the rod]') or by two predicates, one encoding Cause and the other Change-of-State (e.g. TEAR-A-FLAT-OBJECT LONG-THIN-OBJECTS '[he] shreds the paper into pieces').

In several SLs, *reflexives* are expressed by a separate sign SELF (Leeson 2002). Moreover, agreeing verbs can express the reflexive relation by specifying the same locus for both subject and object agreement (Sandler & Lillo-Martin 2006; Kimmelman 2009a). Pfau & Steinbach (2003) argue that DGS *reciprocals* are either expressed by reduplication or by zero marking

Given that there is very little research on AS for any particular SL, and that available studies offer almost no cross-linguistic perspective, the **first goal** of the project is to describe AS, AS-alternations, and AS-changing structures in three unrelated SLs – an unprecedented endeavor because of (i) the comprehensive research on each SL and (ii) the cross-linguistic perspective. AS in the three SLs will be compared to each other and to spoken languages.

GOAL-II: Evaluation of competing theoretical accounts

Within the generative framework, there are different theoretical accounts of AS in spoken languages (Ramchand, to appear), the main discussion being whether AS is part of a verb's lexical description (Levin & Rappoport Hovav 2005) or is built in syntax (Hale & Keyser 2002; Borer 2005). Presence of regular classes of verbs with rigid AS can be an argument in favor of the former view, while a highly variable AS-behavior of verbs speaks in favor of the latter approach.

SLs can provide an important contribution to this debate. One theoretical study of AS in SLs (Benedicto & Brentari 2004) analyzes *classifier predicates* (CIPs), complex signs in which the handshape functions as a classifier, expressing certain semantic properties of an argument (e.g. extended index finger for a person), while the movement expresses movement/location of the referent. Different types of classifiers have been identified, e.g. body-part classifiers and entity classifiers. Benedicto & Brentari argue that in ASL, these classifiers introduce external and internal arguments, respectively. Therefore, a CIP containing a body-part classifier is an intransitive verb with an agent as the only argument (like English *walk*), while the same root combined with an entity classifier yields a verb with only a patient argument (like English *fall*). This argues in favor of syntactic accounts of AS: AS is not part of the lexical description of verbal roots; rather, roots combine with classifier morphemes, which participate in the syntactic derivation by introducing arguments. It is difficult to capture this phenomenon within a lexical theory.

However, Benedicto & Brentari do not consider other types of verbs, e.g. plain and agreeing verbs, and do not study possible limitations on their AS which might undermine their syntactic approach. Furthermore, data from most other SLs has never been used to inform this debate.

A separate theoretical question specific to SLs concerns possible modality effects in the domain of AS. SLs use the visual-spatial modality, which manifests itself in the use of space, iconicity, and simultaneity in grammar. It is therefore important to study whether any of the modality-specific aspects of SLs surface in AS-marking. For instance, both CIP and some other verbs involve spatial agreement, a modality-specific tool for identifying arguments.

To date such theoretical questions have only been addressed for a very limited number of SLs and only some subclasses of verbs. Therefore, the **second goal** of this project is to assess competing theoretical accounts of AS based on data from the three SLs. We will test whether CIPs and other verbs argue for a syntactic or lexical approach to AS. Furthermore, we will investigate whether AS in the three SLs features any modality-specific properties.

GOAL-III: Development of methodological tools

Previous research on AS in SLs has mainly focused on one SL, and the few studies that addressed two or more SLs show that a comparison between SLs is aggravated by the lack of developed methodology (Benedicto, Cvejanov & Quer 2007). It is thus crucial to develop methodological tools that can be used for all SLs included in the project. In order to ensure comparability of the data, two methods will be applied to all three SLs:

1. analysis of available SL corpora of spontaneous data.
2. traditional linguistic data elicitation techniques, such as:
 - (controlled) elicitation by means of stimuli in a different language, or by picture and video stimuli;
 - grammaticality judgment tasks.

Although existing SL corpora are of a modest size, they provide a hitherto unknown amount of naturalistic data. Recent corpus-based research on AS in spoken languages has shown that basic properties of AS can indeed be extracted from corpora (Tao 2003; see also Gries, to appear, for general methodology). It will be instructive to apply a similar methodology to SLs.

However, it is unlikely that sufficient information on verb types, AS-alternations, and AS-changes can be obtained using only corpus data. While there are questionnaires available for studying AS in spoken languages (Nichols 2005, LVCP 2010), it is well-known that such spoken language based materials are generally not easily applied to SLs (Van Herreweghe & Vermeerbergen 2012). Therefore, the **third goal** is to develop elicitation materials that can be used to study AS in the three SLs, including (i) grammatical tests for transitivity and other properties of AS, as well as AS-alternations/-changes, that can be applied to SLs (taking into account existing tests from Benedicto & Brentari (2004) and others), and (ii) visual elicitation materials for passives (Tomlin 1995), causatives, applicatives, reflexives, and reciprocals. In future studies, this methodology can be fruitfully applied to other SLs.

Crucially, Deaf research assistants will be involved in the data analysis and the development of tests.

Research questions

As mentioned above, the project has three major goals: one empirical, one methodological and one theoretical goal, which serve to answer the two major research questions:

1. What verb types are distinguished in RSL, NGT, and DGS with respect to AS and what AS-alternations and AS-changing strategies exist in these languages?
2. What theoretical account is most compatible with the data from the three SLs?

Both research questions will be addressed in each of the three subprojects by investigating one of the SLs in question. In addition, the second research question will be addressed in the general synthesis.

Social benefits and valorization

The project has important social benefits. First, the scientific study of SLs is known to have a positive impact on the status of these minority languages. While by now, it is generally acknowledged that SLs are fully-fledged natural languages, in the Netherlands, Russia, and parts of Germany, they have not yet been recognized as minority languages. Therefore, we will communicate the outcome of the project to the Deaf community and Deaf societies in the respective countries by means of lectures, summaries on their websites (in written language and SL), and articles in journals that address the Deaf community.

Second, the proposed research has direct practical applications, as the outcome will be most valuable for developing and improving teaching materials. For the most part, the structures to be investigated are not addressed in available teaching materials. Rather, verbs are taught as individual lexical items, but learners would no doubt profit from a structured presentation of verb types and AS-changing strategies. Making AS properties explicit will allow them to detect patterns that can be applied to newly learned verbs, thus enhancing

learning success. Consequently, in order to reach the stakeholders, a crucial aspect of valorization is the organization of a workshop at the Hogeschool Utrecht (NGT teacher/interpreter training program) in the fourth year of the project in order to instruct those developing teaching materials. Similar actions will be undertaken in Russia and Germany (see Table in Section 13). In addition, the results will be communicated to the *Nederlands Gebarencentrum* (Dutch Sign Centre), where aspects of NGT grammar are researched. Also, a summary of the outcome (in Dutch) will be published in *Interpres*, the journal of the Dutch Society for SL Interpreters.

Subproject 1 – PhD student:

Argument structure in Sign Language of the Netherlands (NGT)

The first subproject for a PhD candidate investigates AS in NGT. NGT is a relatively well-studied SL: studies on grammatical topics, including word order (Coerts 1994), topic/focus marking (Crasborn et al. 2009, Van der Kooij & Crasborn 2013), classifiers (Zwitserlood 2003), and reflexives (Kimmelman 2009a) are available. However, no systematic investigation of AS has been offered so far.

Importantly, there is an extensive corpus of natural NGT data, the Corpus NGT (<http://www.ru.nl/corpusngtuk/introduction/welcome/>), which contains many hours of signing by more than 90 signers (Crasborn & Zwitserlood 2008). The corpus is partially glossed and is being annotated further at the moment. In addition, the glosses used are linked to a large NGT dictionary (Crasborn & de Meijer 2012), which makes glossing consistent and enables a systematic study of the AS of particular verbs. The project is thus timely, as it will be the first to use the Corpus NGT to study AS. Dr. Onno Crasborn (University of Nijmegen), project leader of the Corpus NGT project, and responsible for the maintenance and annotation of the Corpus NGT, has expressed that he will be happy to offer the necessary support.

This subproject addresses **Goal-I** and **Goal-II** of the project (i.e. description of AS in a SL and assessment of theoretical approaches to AS) for NGT. It will answer the following research questions:

1. What are the main groups of verbs with respect to AS in NGT?
2. Do NGT verbs show AS-alternations, such as causative-inchoative, dative, locative?
3. Are there systematic syntactic and/or morpho-phonological AS-changing strategies, such as passives, causatives, applicatives, reciprocals, reflexives?
4. Is NGT data compatible with the lexical or syntactic view of AS?

The candidate for this subproject should have a strong background in sign language research and be familiar with AS theory. S/he should have good knowledge of NGT and should also have experience with SL corpora and data annotation. Preference will be given to a deaf applicant with equal qualification.

Subproject 2 – PhD student

Argument structure in German Sign Language (DGS)

The second subproject for a PhD candidate mirrors the first subproject but analyzes data from DGS. As for aspects of its grammar, this SL is also relatively well-studied, including a brief grammatical description (Papaspyrou et al. 2008), and studies on negation (Pfau 2008), prosody (Herrmann, in press), agreement (Rathmann 2003), classifiers (Glück & Pfau 1997), and reciprocals (Pfau & Steinbach 2003).

Importantly, a large DGS corpus has been collected and is being annotated at the moment (<http://www.sign-lang.uni-hamburg.de/dgs-korpus/index.php/welcome.html>; Hanke et al. 2012). The corpus contains video recordings of 330 signers from different regions of Germany. The annotation includes links to an extensive dictionary and phonological description of signs, which makes it possible to study AS for selected verbs contained in the corpus. As is true for the NGT corpus, the DGS corpus data have not yet been analyzed from the perspective of AS. Prof. Dr. Christian Rathmann (University of Hamburg), project leader and linguistic supervisor of the DGS-corpus project, has expressed that he will be happy to offer the necessary support.

This subproject also addresses **Goal-I** and **Goal-II** of the project (i.e. description of AS in a SL and assessment of theoretical approaches to AS). The research questions for DGS parallel those for NGT:

1. What are the main groups of verbs with respect to AS in DGS?
2. Do DGS verbs show AS-alternations, such as causative-inchoative, dative, locative?
3. Are there systematic syntactic and/or morpho-phonological AS-changing strategies, such as passives, causatives, applicatives, reciprocals, reflexives?

The candidate for this subproject should have a strong background in SL research and be familiar with AS theory. S/he should have good knowledge of DGS and should also have experience with SL corpora and data annotation. Preference will be given to a deaf applicant with equal qualification.

Subproject 3 – Postdoc

A comparative study of argument structure in sign languages: Typological and theoretical implications

The postdoc will address all three goals of the project. Firstly, he will conduct research on yet another SL, namely RSL, which is neither related to DGS nor to NGT (**Goal-I**). Secondly, this subproject investigates typological and theoretical implications of AS in the three SLs (**Goal-II**). Thirdly, this subproject will develop a unified methodology for studying AS that can be applied to the three SLs and thus yields comparable results (**Goal-III**). Crucially, the methodology will be designed such that it can serve a standard methodology to be applied in future studies on other SLs. The proposed postdoc, Vadim Kimmelman, has ample experience both with creating elicitation materials (Kimmelman 2009b) and with using

corpus data (Kimmelman 2012b); therefore, he will be able to develop the methodology necessary for the execution of all three subprojects within the first year.

RSL is somewhat less well-studied, but some aspects of its linguistic structure have been investigated, including word order (Kimmelman 2012a), reflexives (Kimmelman 2009a) and Information Structure (Kimmelman 2012b). Importantly, two RSL corpus projects are now being constructed: a small corpus of the Moscow variety of RSL (12 signers) has been collected and annotated (Kimmelman, in preparation), and a larger corpus containing 100.000 signs has been collected and is now being annotated in Novosibirsk (Burkova 2012). Both corpora can be used to conduct research on AS. Svetlana Burkova, project leader of the RSL corpus project, has expressed her interest in collaborating with us on this project.

Since Vadim Kimmelman has already done substantial research on RSL and has participated in creating both corpora of RSL, he can conduct the descriptive research of AS in RSL within a shorter period of time while focusing on intra-modal and cross-modal comparison. The research questions of this project are as follows:

1. Description of AS in RSL:
 - a. What are the main groups of verbs with respect to AS?
 - b. Do RSL verbs show AS-alternations, such as causative-inchoative, dative, locative?
 - c. Are there systematic syntactic and/or morpho-phonological AS-changing strategies, such as passives, causatives, applicatives, reciprocals, reflexives?
2. Cross-linguistic comparison:

What are the differences between RSL, NGT, and DGS with respect to AS?
3. Theoretical issues:

Is the data from all three SL compatible with the lexical or syntactic view of AS?
4. Cross-modal comparison:

What are the modality-specific and modality-independent properties of AS in SLs, based on data from RSL, NGT, and DGS?

Synthesis

The synthesis of this project will be an in-depth discussion of the role of modality – i.e. the oral-auditive versus the visual-gestural modality – in the field of argument structure. Subprojects 1 and 2 will produce dissertations on AS in two different SLs. Subproject 3, which investigates AS in a third SL, together with the research conducted by the main applicant and the co-applicant, will result in an edited volume and peer-reviewed articles addressing cross-linguistic differences and similarities of AS in three SLs and answering the following questions:

1. What are modality-independent and modality-specific aspects of argument structure?
 - a. What is the cross-linguistic variation in the domain of AS between the three SLs?
 - b. What is the cross-modal variation between SL and spoken languages?
2. What insights are gained from the study of SLs concerning theoretically important questions in AS research, such as the debate between lexicon and syntax?

The main applicant and the co-applicant of the project will conduct the theoretical discussion of the results from all three subprojects by (i) investigating the significance of the results for different theories of AS, and (ii) discussing typological implications of the study. The theoretical discussion will be informed and stimulated by an international conference on “Argument structure across modalities” that will be organized in the last year of the project.