

Structure of simple declarative clauses in South African Sign Language

Ella Wehrmeyer

North-West University

This paper presents the first corpus-driven linguistic description of South African Sign Language (SASL) and the first exploration of the structure of simple declarative clauses in SASL. Using a corpus of 40 narratives of 25 signers from three South African provinces, the study finds that SASL exhibits a basic SVO clause structure, but that the most common clause structure is SV. The study also presents evidence of the existence of the null copula in SASL, and finds that SASL exhibits a high tolerance for argument ellipsis. With the exception of their generalisations in terms of locative clauses, the study finds that Napoli and Sutton-Spence's (2014) generalisations regarding sign language syntax hold true for naturalistic narrative discourse in SASL. Finally, the study supports the claim that SASL is a single sign language in terms of its syntactic patterns, despite regional lexical variation.

Keywords: South African Sign Language, declarative clauses, South African Sign Language corpus, information structure, copula constructions, corpus linguistics

1. Introduction

South African Sign Language (SASL) is recognised as an official language of South Africa and is taught at several universities, as well as schools for deaf children (where it is also used as language of instruction since 1994). However, empirical research on its sign order is limited to Vermeerbergen et al.'s (2007) and Van Herreweghe & Vermeerbergen's (2012) studies comparing SASL with Flemish Sign Language (VGT), both relying on elicited data. The present study therefore makes a contribution to the field in being both the first empirical study on the structure of simple declarative sentences in SASL based on naturalistic narrative discourse (by which I mean in the general sense of a coherent set of utterances), and the first corpus-driven linguistic description of SASL syntax.

Indeed, reliance on elicitation instead of corpus data for syntactic data has been criticised (see, e.g., Napoli & Sutton-Spence 2014). Napoli and Sutton-Spence also warn that with elicitation, participants can adapt their sign order to conform to spoken language grammatical rules, for example, if they think that the researcher is more familiar with the spoken language (see Coerts 1994; Kimmelman 2018; Lucas & Valli 1992). This study concurs and proposes that the sentence structure of isolated sentences, where all arguments have to be introduced as novel, differs from that of spontaneous narrative discourse, where at least some arguments have been previously established. It therefore seeks to answer two questions in the context of naturalistic narrative discourse:

- i. What is the structure of simple declarative clauses in SASL?
- ii. In clauses possessing at least two arguments, what is the preferred order of S, O and V?

To contextualise SASL syntax, this paper first introduces findings regarding clause structure in other sign languages (Börstell et al. 2016; Kimmelman 2018, 2019; Lourenço & Quadros 2020; Napoli & Sutton-Spence 2014; Napoli et al. 2017; Napoli & Sutton-Spence 2021; Quadros 2003). These studies also propose grammatical generalisations that may be useful in describing SASL sign order. Thereafter, previous research on SASL sign order is reviewed.

2. Clause structure studies in sign languages

Napoli & Sutton-Spence (2014) study data from 47 research papers on a range of sign languages that used various data collection methods, including elicitation. They find that all sign languages order their major constituents SOV or SVO, and conclude that the order of S with regard to the predicate V is driven by (i) sensorimotor pressures that feed universal grammar, (ii) constraints of the visual modality, and (iii) language-specific constraints.¹ Based on their survey, Napoli & Sutton-Spence (2014) make six useful generalisations regarding sign order:

- Generalisation 1: Both SVO and SOV orders are grammatical;
- Generalisation 2: Lexicalised arguments affecting the phonological shape of the predicate precede it;

1. Typically S = subject/agent, V = verb/predicate, and O = object/recipient/theme/patient (see Section 4). In this paper, the focus is on manually expressed arguments. However, Napoli & Sutton-Spence (2014) note that some of the publications that they studied also incorporated mouthed arguments, and that the different methods and theoretical frameworks in the studies examined might have introduced theoretical bias.

- Generalisation 3: The most common sentence type consists of a single argument preceding the predicate;
- Generalisation 4: Larger/immobile objects generally precede smaller/mobile ones in locational expressions;
- Generalisation 5: O is typically adjacent to V;
- Generalisation 6: SVO is preferred in reversible sentences with plain verbs.

They propose that iconicity, visual coherence, and economy of movement influence sign order.

2.1 Clauses with less than two arguments

The most common clause type in signed discourse consists of a single argument, usually preceding the predicate (Generalisation 3; see, e.g., Börstell et al. (2016) for Swedish Sign Language (SSL); Costello (2016) for Spanish Sign Language (LSE); Goldin-Meadow (2003) on home sign; Kimmelman (2012, 2018) for Russian Sign Language (RSL); Lillo-Martin (1986) for American Sign Language (ASL); Napoli et al. (2017) and Quadros (2003) for Brazilian Sign Language (Libras); Sandler et al. 2005 on young sign languages). Obviously, clauses with intransitive verbs follow this pattern. However, SV and OV patterns can also result from ellipsis, objects being phonologically encoded in the verb (such as with classifier predicates) or implied by direction (as with agreement verbs), or subjects being embodied in the signer (Meir et al. 2017) or cliticised (Napoli & Sutton-Spence 2021). For RSL, Kimmelman (2018) found single-argument V-initial constructions (VS or VO) that did not seem to require a second argument, but noted that these constructions were uncommon, occurring mainly with existential verbs (e.g., HAPPEN STORM) or possessives (e.g., HAVE CAR) (see also Napoli & Sutton-Spence 2014, 2021). Napoli & Sutton-Spence (2021) also observe VOV and VSV structures in which the V is repeated.

Second, clauses consisting of a single verb without arguments have been found. Kimmelman (2012, 2018) observed the existence of independent clauses in his RSL corpus consisting only of single predicates that do not require arguments (e.g., RAIN). Börstell et al. (2016) found that single-verb clauses without arguments (i.e., just V) were the most common construction in their SSL dataset, and concluded that these arose mainly due to ellipsis.

Although such clauses cannot shed light on the ordering of S, V and O, they indicate that some sign languages (e.g., RSL, ASL, Libras, and SSL) are more tolerant of ellipsis as a discourse device than others. Thus, in contrast to isolated clauses produced by elicitation methods, in higher-order discourse patterns, arguments do not need to be overtly realised if they can be recovered from the immediate context.

2.2 Clauses with at least two arguments

From Generalisation 1, it can be expected that in clauses where both S and O are lexicalised (that is, in which the verb is transitive), both SVO and SOV orders will be found. Napoli & Sutton-Spence (2014) find that SOV order is grammatical for all sign languages, and even three arguments can precede the predicate, as in the RSL example in (1a). It is thought that languages change diachronically from SOV to SVO (Newmeyer 2000; see also Meir et al. 2010; Van Gelderen 2011). This is supported by SOV default order in gesture studies (see, e.g., So et al. 2005) and in studies of spontaneous communication (Langus & Nespor 2010). SOV has been reported as the default order for New Zealand Sign Language (NZSL, McKee & Kennedy 2005), Kenyan Sign Language (Morgan 2020), German Sign Language (DGS, Proske 2022), and Japanese Sign Language (JSL, Fischer 2014). By contrast, SVO is found to be the default order for ASL (see, e.g., Aarons 1994; Fischer 1975; Liddell 1980; Neidle et al. 2000; Padden 1990), Libras (Lourenço & Quadros 2020; Quadros 2003), Croatian Sign Language (Milković et al. 2006), Hong Kong Sign Language (Sze 2003), Israeli Sign Language (ISL, Novogrodsky et al. 2023), and SSL (Bergman & Wallin 1985; Börstell et al. 2016). Lourenço & Quadros (2020) argue that other orders found in Libras (SOV, OSV, and VOS) result from syntactic operations such as topicalization, focalization, or agreement, and are typically signalled by nonmanual markers (see also Quadros 2003), as in (1b). Similarly, SOV and OSV have been described in ASL as marked and a result of object shift in the presence of handling, aspectual, or agreement verbs, or of topicalization (Aarons 1994; Chen Pichler 2001; Fischer 1975; Liddell 1980).² However, researchers are not always in agreement about what the default sign order of a sign language is: for example, Volterra et al. (1984) report that SVO is the default order for Italian Sign Language, whereas Cecchetto et al. (2006) find SOV to be the default order. Quadros (2003) suggests that modal verbs can also reveal the default clause structure (see (1c), illustrating the modal verb in second position, thereby affirming SVO structure for ASL).

- (1)

a.

BOY BASKET APPLE CL_{HL}(5b5b)-THROW-alt FULL
‘The boy threw apples into the basket until it was full.’
[RSL; Kimmelman 2018: 22]
- b.

topic

hn

SOCCER, IX JOHN LIKE
‘As for soccer, John likes it.’
[Libras; Quadros 2003: 143]

2. By contrast, De Langhe et al. (2004) propose that OSV is the default order in French Sign Language.

C. JOHN MUST BUY HOUSE

‘John must buy a house.’

[ASL; Neidle et al. 2000: 81]

Scholars have explored reasons for SVO versus SOV order in sign languages. Liddell (1980) proposed that iconicity determines sign order. Napoli et al. (2017) find that for Libras, extensional verbs (verbs for which an object is presupposed to exist, e.g., GIVE, PUT-ON) prefer SOV order, whereas intensional verbs (verbs for which an object is not presupposed to exist, e.g., THINK, WANT) prefer SVO order, especially when the object is complex, as in (2a). They also observed that clauses containing what they called morpho-/phonologically “heavy” objects, as in (2b), typically prefer SOV order. This concurs with Napoli & Sutton-Spence’s (2014) second generalisation that lexicalised arguments affecting the phonological shape of the predicate (such as those occurring with classifier constructions, agreeing verbs, spatial verbs, pointing verbs, and argument sensitive-verbs) typically precede it, but can be placed after the argument-sensitive verb for dramatic impact (see also De Langhe et al. 2004; Emmorey 2003; Jantunen 2008; Liddell 1990; Padden 1988; Quadros & Lillo-Martin 2010; Sze 2003; Vermeerbergen et al. 2007; Volterra et al. 1984). However, Kimmelman (2012) finds that agreeing verbs in RSL typically prefer SVO.

(2) a. I WANT [MARY WORK BETTER]

‘I want Mary to work better.’

[Libras; Quadros 2003: 145]

b. WITCH WALL PAINT@CLb=wall

‘The witch paints the wall.’

[Libras; based on Napoli et al. 2017: 654]

Reversibility is another factor influencing sign order (Napoli and Sutton-Spence’s sixth generalisation). Typically, SVO is preferred in reversible sentences, especially with plain verbs (Volterra et al. 1984; see also Lourenço & Quadros 2020; Quadros 2003; Vermeerbergen et al. 2007) or with animate arguments (Hall et al. 2013). By contrast, SOV is typically more common than SVO in nonreversible sentences. Notwithstanding, exceptions have been observed for Sign Language of the Netherlands (NGT, Coerts 1994), and VGT (Van Herreweghe & Vermeerbergen 2012; Vermeerbergen 1996; Vermeerbergen et al. 2007), where reversible sentences occur with both SVO and SOV structures. By contrast, Meir et al. (2017) relates clause order to animacy, finding that nonhuman objects were more likely to be found in SOV structures and human objects in SVO structures.

Besides topicalisation, OSV order can result from locative constructions (Volterra et al. 1984; see also Napoli & Sutton-Spence 2014; Napoli et al. 2017; Vermeerbergen et al. 2007). Napoli et al. (2017: 643) observe that locative-type constructions can also occur with verbs not considered locative or presentative, and where nonmanuals suggesting topicalisation are absent, e.g., FENCE CAT SLEEP (‘The cat sleeps on the fence’). VSO and VOS also typically occur rarely. Since

verbs are seldom topicalised, Napoli & Sutton-Spence (2021: 207) consider verbs in clause-initial position as “scene setters”, in that they “introduce not just a participant in an event, but the whole world of an event”, and guide the recipient in how to interpret the event. Their notion of clause-initial verbs as ‘scene setters’ also applies to the independent VO (e.g., HAPPEN STORM) and V (e.g., RAIN) constructions observed by Kimmelman (2018). Sign orders OSV and VSO contradict Napoli & Sutton-Spence’s (2014) fifth generalisation that O is typically adjacent to V, and are therefore marked.

2.3 Clauses containing multiple verbs

Napoli et al. (2017) argue that multiple verbs articulated simultaneously, as in (3a), and serial verbs (3b) constitute a single predicate, but analyse complex actions involving chronological sequencing of events as multiple clauses (3c), even if the meaning can potentially be described using a single word (e.g., ‘hang’). However, Mithun (1988: 334) contends that predicates conjoined through intonation often describe the same “visual act”, citing (3d) from Parengi (Aze & Aze 1973; cited in Mithun 1988: 335). The notion of a “visual act” is even more pertinent for sign languages, considering their visual-spatial modality (see Napoli & Sutton-Spence (2021) regarding the scene-setting function of verbs).

Second, Napoli et al. (2017) analyse verb sandwiches of the type SVOV, where the second V is a repetition or close synonym of the first V (see Fischer & Janis 1990), as SVOV, that is, as two clauses, the first having SVO structure and the second one being a single verb, see (3e). In contrast, Meir et al. (2017), Novogrodsky et al. (2023), and Morgan (2020) analyse verb sandwiches as a single clausal unit. Napoli & Sutton-Spence (2014) observe that their sixth generalisation also applies to verb sandwiches in that the first V is usually a plain verb and the second verb is usually morphologically or phonologically complex.

Third, Napoli & Sutton-Spence (2014) analyse split-sentence constructions in which the subject of the first clause becomes the object of the second clause, as in Example (3f), as constituting two simple SV clauses S_1V_1 and S_2V_2 (see also Meir et al. 2017; Quadros 2003). If the second argument functions as both the object of the first clause and the subject of the second clause, as in (3g), Liddell (2003) and Johnston et al. (2007) analyse these constructions as $A_1V_1A_2V_2$, interpreting the second verb as a second clause, whereas Novogrodsky et al. (2023) analyse them as a single clause (SVXV) in ISL.

- (3) a. PIRATE BALL TUCK-UNDER-ARM +WALK
 ‘A pirate walks carrying a ball.’

[Libras, Napoli et al. 2017: 662 (my translation)]

- b. TOWER GNOME DECIDE CLIMB
 ‘The gnome climbs the tower.’
 [Libras, Napoli et al. 2017: 662 (my translation)]
- c. PRINCESS SCARF FLAP, PEG
 ‘The princess straightened out the scarf and then hung it up.’
 [Libras, Napoli et al. 2017: 662 (my translation)]
- d. enoʔn d’ar-t-ay zum-t-ay
 to-him grasp-FUT-SP eat-FUT-SP
 ‘I will grab him and eat him.’ [Parengi, Mithun 1988: 334]
- e. GIRL TAKE BOOK GRAB
 ‘The girl grabbed the book.’ [ISL, Novogrodsky et al. 2023: 49]
- f. GRANDMOTHER STAND-STILL, CHILD HUG
 ‘The grandmother stands still, and the child hugs her.’
 [LIS, Volterra et al. 1984: 32 (cited in Johnston et al. 2007: 168)]
- g. BOY RIDE GIRL CRAWL
 ‘A boy rides on a crawling girl.’
 [ISL, Novogrodsky et al. 2023: 49 (my translation)]

2.4 Other considerations in clause analysis of sign languages

Quadros (2003) observes that main verbs can be elided from complex sentences, resulting in verb-less constructions in the second clause, as in (4a) (see also Börstell et al. (2016) for SSL; Kimmelman (2018) for RSL). In addition, clauses may have multiple objects. For Kenyan Sign Language, Morgan (2020) notes SO_1VO_2 constructions in which the subject and first object are animate and the second object is inanimate. Novogrodsky et al. (2023) also observe SO_1VO_2 constructions in ISL, which they analyse twice as SO_1V and SVO_2 , that is, by focusing on each object as separate clauses in a complex sentence. However, Napoli et al. (2017) accept multiple objects as a single argument, provided that they relate to the same verb.

Finally, most studies exclude other syntactic components from their analyses, focusing exclusively on simple direct and indirect objects. However, Quadros (2003) observes that temporal and frequency adverbs did not occur between the verb and the object in her data, supporting Napoli & Sutton-Spence’s (2014) fifth generalisation. Hence, clauses such as (4b) are ungrammatical in Libras.

- (4) a. $\text{eg} \quad \text{hn}$
 $\text{bJOHN LIKE}_a \text{MARY}_a \text{AUX}_b \text{ALSO}$
 ‘John likes Mary; she also (likes John).’ [Libras; Quadros 2003: 152]
- b. * JOHN BUY YESTERDAY CAR [Libras; Quadros 2003: 145]

3. Clause structure of South African Sign Language

Only two papers (Vermeerbergen et al. 2007; Van Herreweghe & Vermeerbergen 2012) have previously dealt with clause structure in SASL. Both studies were also included in Napoli & Sutton-Spence's (2014) overview. Vermeerbergen et al. (2007) compared sentence structure in SASL and VGT for three types of simple sentences (locative, reversible, and nonreversible), using Volterra et al.'s (1984) elicitation method, namely six sentences elicited from pictures for each kind of sentence construction, rendering a very small dataset of 18 different sentences produced by four signers for each language. For SASL, they found (i) that locative sentences always started with the location, followed by the located element and then the relation (a verb or verbal construction); (ii) that the most common patterns for nonreversible sentences were SOV and OSV, and for reversible sentences OSV. That is, verb-final constructions constituted the bulk of their dataset. They found no SASL examples with prepositions introducing the object, as was found for VGT. The follow-up study (Van Herreweghe & Vermeerbergen 2012) on the same dataset reiterated the previous study's findings for SASL, and also explored split-sentence constructions. They viewed such constructions as complex, but did not propose how to analyse them.

4. Method

4.1 Data collection

The South African Sign Language Narrative Corpus (under construction) consists of stories told by Deaf participants about themselves (first-person narration) and about others (third-person narration). The corpus currently consists of 45 narratives from 25 participants from Pretoria (Gauteng province), Potchefstroom (North-West province), and George (Western Cape province). In order to optimise fluent production, since prepared speech is less likely to contain false starts and syntactic errors, participants were informed beforehand of the two tasks so that they could plan what they wanted to say (not all did). Participant recruitment is done through local Deaf leaders of people the Deaf leader considers to be highly proficient signers in their local community. The Pretoria group used Afrikaans as their spoken language, the Potchefstroom group English, and the George group both English and Afrikaans. (Participants' proficiencies in speaking, lipreading, reading, and writing in their spoken language varied.) Because participants older than 37 might have been exposed to signed English or Afrikaans during their

school years, the recruiters were also requested to exclude signers who they knew used signed English or Afrikaans.

All participants related their life stories. For the third-person narrative, four Pretoria signers retold the Joseph narrative, of which two knew the story, using the provided children's picture Bible only to check for completeness (commenting on aspects they had forgotten in their retelling of the story), whereas the other two were not familiar with the story and told their own version, using the pictures as prompts (see Wehrmeyer 2023). The other Pretoria signers did not use any elicitation materials. All related their life stories. Six of the Potchefstroom group told third-person narratives of their own choice. Four participants who came unprepared and two whose third-person narratives were very short (less than a minute) were introduced to the *Frog, where are you?* story (Mayer 1969 – two participants), a 'Masha and the Bear' cartoon (Season 1 Episode 1 – two participants), a Youtube cartoon of the creation story (one participant), and an expanded version of *The horse story* (adapted from Hickmann 2003 – one participant). Participants could view the material several times (but without anyone signing or explaining the story to them) before their retelling. Powerpoint presentations were pre-prepared using selected images from these stories and used as cued prompts during the participant's retelling (as with the Pretoria group, the participant is not interrupted and must themselves request to move on to the next picture). All seven of the George participants narrated their life story. However, the third-person 'narratives' (of the three who remembered to provide them) were very short (about three utterances each), so a second recording day has been scheduled in the near future.

Demographic data of participants is summarised in Table 1. Until 1994, schools for the Deaf in South Africa were segregated by race, not by gender. Thus, participants under 30 years would have attended racially mixed schools. However, the local Deaf communities were still racially distinctive at the time of recording.

Table 1. Demographics of participants*

Group	#Participants	Gender	Race	Age	Sign age
Pretoria	9	2F; 5M	White	2Y; 3M; 4O	3B; 4E; 2L
Potchefstroom	9	5F; 4M	Black	3Y; 5M; 1O	8E; 1L
George	7	1F; 6M	Coloured	3Y; 3M; 1O	5E; 2L
Total	25	8F; 15M	9W; 9B; 7C	8Y; 11M; 6O	3B 17E 5L

* F = female; M = male; W = White; B = Black; C = Coloured; Y = Age < 35; M = Age 35–50; O = Age 50+; B = sign from birth (deaf parent(s)); E = early signer; L = late signer (Age 7+).

The current dataset constitutes 104:15 minutes of recorded data from the Pretoria group, 61:27 minutes of recorded data from the Potch(efstroom) group, and 17:07 minutes of recorded data from the George group, giving a total recording time of 3h 3 min. All of the data are translated and transcribed with a lemmatized (English) gloss, and eight files (4 Pretoria and 4 Potch) have been fully annotated for nonmanuals.

4.2 Data analysis

Johnston et al. (2007) note that identifying clauses in a sign language is at best “messy” (see also Crasborn 2007; Jantunen 2008). Prosodic clues in the form of nonmanual markers (NMMs) such as head and body movements, and eye actions are helpful, but as Börstell et al. (2016) observe, trying to determine clause boundaries using prosody alone is time-consuming and often inaccurate. Quadros et al. (2023) give useful information on how clause boundaries may be demarcated by NMMs. While prosodic and NMMs were used as guidelines, the study followed Börstell et al.’s (2016: 20) “clause rules”:

- i. A clause is distinguished on semantic grounds as a unit that minimally contains a predicate and its arguments.
- ii. Optional modifiers (peripheral elements) are included unless they form independent clauses themselves through subordination or coordination.
- iii. Multiple predicates are included only if they are formally and/or semantically related (e.g., GRAB, TAKE) and describe the same situation.
- iv. The elements of a clause should fall within a uniform prosodic unit.

Following Quadros et al. (2023), complex coordinate clauses are split at the conjunction or where nonmanuals signify the clause boundary, and the two clauses are analysed separately. For complex sentences with embedded clauses, only the main clause is analysed. A study of complex sentences is envisaged for future research. Because this is the first study to investigate clause structure in SASL, I focus only on active declarative clauses, in which there is a clear idea of who is doing what to whom/what. The study of passives and impersonal constructions is envisaged for future research.

For the study, a syntactic annotation tier (see Figure 1) was added in ELAN (Crasborn & Sloetjes 2008) to existing tiers for translation, lemmas, and NMMs (see Wehrmeyer (2015a) for corpus NMM annotation codes). The syntactic annotation is in the form of a single string code per clause (e.g., <syn-s-SVO>, developed in Wehrmeyer (2019a), using parts-of-speech codes commonly used by other researchers (see, e.g., Kimmelman 2019; Napoli & Sutton-Spence 2014; cf. Börstell et al. 2016): V refers to the main verb, S refers to the subject/agent, O

to the direct object/patient, and O₁ to the indirect object. Because these labels are problematic, the current study adopts Janzen et al.'s (2001) idea of the agent-patient relationship as a flow of energy from subject/agent to object/patient, and embraces Proske's (2022) definitions of the subject as the most agent-like argument, and the object as the most patient-like argument. Auxiliary verbs were annotated as v, e.g., *BROTHER++ MUST LEAVE* = SvV. Psych verbs (see Oomen 2017) are annotated as P for future research, e.g., *BROTHER++ ANGRY* = SP, but are analysed as SV.

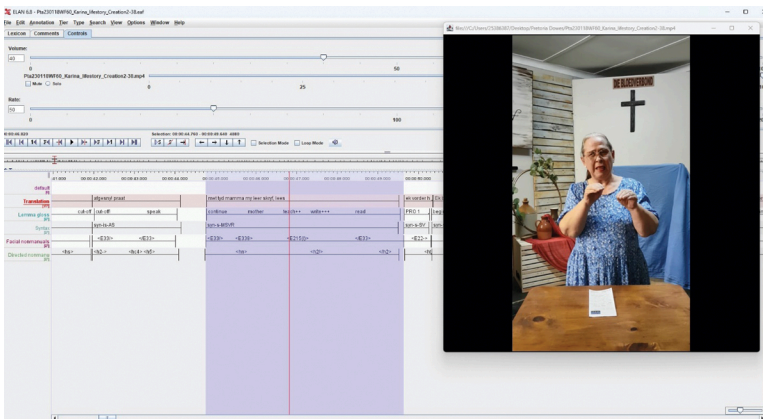


Figure 1. Screenshot of ELAN with translation, sign gloss, and annotation tiers

Mouthings are not annotated as arguments (but may provide clues to elided arguments), and where relevant are encoded on the lemma tier. Elided (null) subjects (glossed in the examples as Φ) that were explicated in the preceding context, particularly those that were topic-marked, and subjects that are encoded by the signer's body (Meir et al. 2017) or cliticised onto the verb (Napoli & Sutton-Spence 2021) are annotated as (S). Although their ellipsis is often signalled by NMMs, a prosodic break, or INDEX (see Quadros 2003; Quadros et al. 2023), their position in the clause relative to the verb is less certain than when the subject is expressed manually. However, if the subject of a complex sentence is manually expressed, then the subjects in the coordinated simple clauses making up the complex clause are annotated as S and not as (S), since their position relative to their verbs is known.

Objects implied in the predicate (through phonological incorporation, eye-gaze, or movement towards a previously-established reference) are coded as (O), e.g., *EAT* (food) = V(O); *EGYPTIAN++_a TAKE_b* (Joseph) = SV(O). Similarly, implied indirect objects (through direction, eyegaze, or movement) were coded as (O₁), for example, in [*HEAVEN EARTH*]_{Subject 3} *GIVE₁* (me) *WISDOM*, the indirect object

is not manually signed but simply implied by the endpoint of the movement for GIVE, and the clause is annotated as SV(O₁)O. (S), (O) and (O₁) are ordered in the annotation string based on clues given by the signer such as mouthing and direction.

Following Börstell et al. (2016), repetitions, close synonyms, and different signs referring to the same referent are annotated using the same label. In this study, multiple arguments relating to the same verb are analysed as a single complex subject/object, as in (5a). In (5b), to describe the Pharaoh's dream, the signer uses reference locations reinforced by eyegaze and head-torso turns to skilfully describe two sets of subjects (thin cows and thin wheat stalks on her right) and objects (fat cows and fat wheat stalks on her left) in a complex sentence. The direction of the verb COME (from signer's right to left) distinguishes agents from patients. Because the actions of the two sets of arguments (cows; stalks) are independent and their positions relative to the verb maintained, the sentence was analysed as two SOV clauses. Subordinate clauses functioning as objects, as in (5c), are annotated as R. (Please consult the Appendix for notation conventions in the SASL examples.)

- (5) a. $\frac{\text{ht}}{\text{MOON SUN STAR++}} \text{ }_3\text{LOOK}_1$
 'The moon, the sun, and the stars all looked at me.'
 [SASL corpus, Pretoria_Karina]
- b. $\frac{\text{h(right)}}{\text{THIN COW, FAT COW, ALSO WHEAT STALKS, FAT, OTHER}} \text{ }_{\text{right}}\text{THIN,}$
 $\frac{\text{h(left)}}{\text{right COME}_{\text{left}} \text{ DVeat-up, EAT.}}$
 'The thin cows ate up the fat cows, and the thin wheat stalks ate up the fat wheat stalks.'
 [SASL corpus, Pretoria_Karina]
- c. #JOSEPH SEE $[_{\text{right}}\text{CROWD } _{\text{right}}\text{COME}_1]$
 'Joseph saw many people coming towards him.'
 [SASL corpus, Pretoria_Dewald]

Following Börstell et al.'s (2016) second clause rule and Mithun (1988), conjoined verbs depicting the same visual ("situation"), referring to the same argument(s) and not interrupted by prosodic or nonmanual markers – as in Examples (6a) and (6b) – are accepted as belonging to the same clause, whether the actions occur or are executed simultaneously or sequentially.³ Changes in head/torso/eyegaze directions are also taken into account, but since these movements are also used to mark topics and reference locations, they do not always indicate clause

3. Slight prosodic breaks between signs allowing the hands to return to centre position are discounted (e.g., CHILD+++ ENCOURAGE).

boundaries. Acknowledging conjoined verbs as a single complex predicate precludes inflating the data with SV constructions. Similarly, verb sandwiches (6c) are analysed as a single clausal unit (SVOV, following Meir et al. 2017; Morgan 2020; Novogrodsky et al. 2023). This allows the researcher to determine their frequency of occurrence, and precludes potentially inflated SVO and SV frequencies (if analysed as SVO.SV). Example (6d) is more complex. The signer isolates the object SACK MONEY by means of eyegaze and holds, then articulates the constructed action glossed as “DVput-in-sack DVsew-down-flap” to his left without prosodic breaks and with unifying nonmanual markers.⁴ Hence, based on the prosody, the two descriptive verbs were interpreted as conjoined and thus as a detailed description of (and therefore synonymous with) HIDE, and the sentence was interpreted as a verb sandwich SV/O/V = SVOV, that is, as a single clause. Split-sentence constructions were annotated as SVOV₁, again, to keep track of interesting data rather than merely increasing SV relative frequencies.⁵ The above decisions mean that the frequencies of SV and SVO in the Results section are conservative.

- (6) a. DOG LISTEN LOOK-AT FROG
 ‘The dog listened and looked at the frog.’ [SASL corpus, Potch_Senzekile]
- b. Φ CL₂+CL_b=ride-horse LEAVE
 ‘(They) left on horseback.’ [SASL corpus, Potch_Dawie]
- c. Φ OPEN MOUTH DVopen-mouth!
 ‘(The bear) opened wide the (wolf’s) mouth.’ [SASL corpus, Potch_Abram]
- d. $\frac{\frac{\text{e(RH)}}{\text{\#JOSEPH HIDE_ (hold) SACK MONEY_ (hold)}} \quad \text{e(audience)}}{\text{h+e+b(left)}}$
 DVput-in-sack DVsew-down-flap
 ‘Joseph hid the sack of money in the sack and sewed it up.’ [SASL corpus, Pta_Dewalt]

Following Kimmelman (2018) for RSL (see (7a) and (1a) above), and based on the results of a previous study (Wehrmeyer 2023) indicating that spatial arguments of

4. In “DVput-in-sack”, the signer’s right hand repeats the movement for HIDE with the hand-shape for MONEY, while the left hand represents Joseph holding open the sack (CLa). In “DVsew-down-flap”, which relates to the arguments JOSEPH and SACK, the signer’s right hand is withdrawn from the left to central signing space while making small circular motions representing “sew”, and the signer’s left hand (still CLa) simultaneously performs a downwards movement.

5. For annotation simplicity, the first verb, its synonyms and any conjoined verbs are annotated as V, and any subsequent semantically different verbs (if present) as V₁, V₂, etc.

verbs of movement (location/goal) function like direct objects in SASL (7b), goal-type spatial arguments were coded as K (=кыда).⁶ They correspond to Börstell et al.'s (2016) obligatory locative complement (Loc). Temporal and (static) spatial modifiers can also function as predicates and are annotated as M. All other adjectival forms are annotated as A. While Kimmelman (2018: 15) accepts static locations as arguments (7c), in this study, M and A are used to identify non-verbal predicates (Börstell et al.'s 2016 nonV) but are not quantified as objects (see (7d), annotated as SVM).⁷

- (7) a. PETERSBURG LEAVE
'(We) went to St Petersburg.' [RSL, Kimmelman 2018: 15]
- b. MOTHER PRO1S SEND SCHOOL HEARING
'My mother sent me to a school for hearing children.'
[SASL corpus, Potch_Ravi]
- c. IX-1 SIT CHAIR
'I sit in a chair.' [RSL, Kimmelman 2018: 15]
- d. PRO1S STAY HOUSE
'I stay at home.' [SASL corpus, George_Roshni]

Evidence of copula constructions, including the null copula, was found in the corpus (see Section 5.3). Afrikaans has many copula verbs (see Ponelis (1979: 218–227); e.g. *wees* = 'to be', *word* = 'become', *bly* = 'stay/remain', *klink* = 'sounds-like', *doen* = 'do'), but to avoid imposing a grammar of a spoken language onto SASL, only copula constructions of the verb 'to be' were annotated as <syn-is-... > (e.g., <syn-is-SA>), whereas other manually expressed copula verbs were annotated as V (see (7d) above). The null copula occurs in Russian, but not in English or Afrikaans, the spoken languages known by the participants. In fact, the use of manually-expressed copular auxiliaries of the verb 'to be' indicates that a person uses signed English/Afrikaans and not SASL. Oomen (2017) observes that NGT and many other sign languages do not have a copular auxiliary. Huddleston (2021) proposes the existence of a null copula in SASL (probably based on anecdotal evidence from SASL users and what is taught in SASL courses at schools and universities), but does not give evidence of its existence. The data in Section 5.3 therefore offer the first empirical evidence of the null copula in declarative clauses

6. See Voynova et al. (1978: 55–60) for a discussion of motion verbs in Russian, and Ponelis (1979: 225f, 234–8, 268, 322) for a discussion of static and kinetic predicates in Afrikaans. For Kimmelman's example (7c), it is not clear whether SIT is accompanied by movement = 'sit down' (CHAIR = K) or not = 'am sitting' (CHAIR = M).

7. Börstell et al. (2016) use A = agent, V = predicate, P = patient, S = single argument, R = ditransitive recipient (my indirect object), T = ditransitive theme (my direct object), Aux = Auxiliary verb, nonV = Non-verbal predicate.

in SASL. Although a detailed analysis of copula clauses in SASL is envisaged for future research, it is evident from the examples given in Section 5.3 that while the clauses tolerate the insertion of another copula verb such as *BECOME* (at the prosodic break signalling the null copula which is often also accompanied by a head nod), the insertion of an action word such as *DO* results in an ungrammatical construction (see Ponelis 1979: 219), e.g., **AROUND AREA EGYPT, DO DRY* (cf. (18c) below).

Because this is the first exploratory study of declarative clauses in SASL, the main focus of the quantitative analysis is on descriptive statistics, namely determining (i) the relative frequencies of occurrence for each clause type in the dataset; (ii) determining the relative distributions of SVO, SOV, OSV, and Other (OVS, VOS, VSO, SVOV, SV₁OV₂) in clauses with at least two arguments; and (iii) determining reversible/nonreversible clause distributions between SVO, SOV, and OSV constructions. For the quantitative analyses, direct (simple and complex) objects took precedence over indirect objects in clauses that had both; for instance, SO₁VR and SO₁VO are categorised as SVO, and (S)OVO₁ as (S)OV. In the rare instances where O occurred in the same clause with K, O is preferred, e.g., (7b) (SOVK) is analysed as SOV.

Besides descriptive statistics, statistical analysis was restricted to χ^2 tests (using Excel and <https://www.socscistatistics.com/tests/chisquare2/default2.aspx>) in terms of the three local signing communities represented in the study to determine whether the differences between the three samples of participants analysed in this study is significant. This is because the issue whether all signing communities in South Africa have a common syntactic and grammatical basis despite obvious regional variation in terms of lexis is still unexplored, despite many claiming (unsupported by research) that this is so. No accurate national population estimates of proficient SASL users exist, so it is not possible to estimate a representative sample size. (Statistics are usually reported in terms of population of Deaf people.) Moreover, it is important to collect data from many more local Deaf communities before generalisations or extrapolations can be made in terms of national SASL syntactical patterns.

5. Results

The results yielded 2,457 declarative clauses. Of the statements with verbs, 1,310 (53.3%) had explicit subjects, whereas 649 (26.4%) had implicit (null) subjects. Furthermore, 498 (20.3%) existential clauses without explicit verbs were found, which provide evidence that SASL possesses a null copula.

5.1 Statements containing explicit subject(s) and verb(s)

Table 2 presents the results for statements with explicit subjects. Because no prior evidence exists in the literature that SASL has a unified grammar, the data for each group is tabled.

Table 2. Sign order in clauses with explicit subjects

Sign order	Pretoria	Potch	George	Total
SV	294 (42%)	189 (41%)	52 (37%)	535 (41%)
VS	8 (1%)	8 (2%)	2 (1%)	18 (1%)
SV(O)	56 (8%)	30 (6%)	1 (1%)	87 (7%)
SVO	166 (24%)	128 (28%)	45 (32%)	339 (26%)
SVR	74 (10%)	14 (3%)	8 (6%)	96 (7%)
SVK	26 (4%)	16 (3%)	9 (6%)	51 (4%)
SOV	49 (7%)	40 (9%)	15 (11%)	104 (8%)
OSV	20 (3%)	10 (2%)	1 (1%)	31 (2%)
OVS	0 (0%)	7 (2%)	3 (2%)	10 (1%)
VOS	0 (0%)	2 (0.4%)	0 (0%)	2 (0.2%)
VSO	2 (0.3%)	4 (1%)	0	6 (0.5%)
SVOV	2 (0.3%)	9 (2%)	1 (1%)	12 (1%)
SvOV	7 (1%)	1 (0.2%)	3 (2%)	11 (1%)
SVOV ₂	1 (0.1%)	7 (2%)	0 (0%)	8 (1%)
Total	705	465	140	1310

For clauses with an explicit subject, SV is the most frequently occurring structure (SV+ SV(O)= 48%), followed by SVO (SVO+SVR+SVK= 37%) and SOV (SOV+ SvOV= 9%) constructions.⁸ That SV clauses are the most common clause structure supports Napoli & Sutton-Spence’s (2014) fourth generalisation. Of these instances, 357 (57%) comprised verbs used intransitively, as in (8a), and nine comprised reciprocal verbs (e.g., MEET). For the remaining instances, an object is implied through directionality (8b), depiction (8c), or from the preceding context (8d). Examples (8b) and (8d) also exemplify multiple verb concatenation. Of the 535 SV clauses, 88 contained conjoined verbs (SVV and SVVV), the absence of intervening prosodic pauses indicating that these verb strings comprise single clauses, not multiple single-verb clauses (see Mithun 1988). Indeed, in (8b), the

8. The few SvV and SvVO clauses are included in the statistics for SV and SVO, respectively.

signer might have imagined a scene in which some Egyptians are bringing up Joseph from the well while another is paying for him. Likewise, in (8d), the repetition indicates that the signer envisages the three different tasks as done simultaneously by different people over a period of time. Of the 18 VS clauses, most contain existential verbs, as in (8e), whereas two can be regarded as “scene setters” (Napoli & Sutton-Spence 2021), as in (8f), which has greater dynamic impact than its translation.

- (8) a. BROTHER++ LEAVE
'The brothers left.' [SASL corpus, Pretoria_Karina]
- b. EGYPTIAN++ TAKE BUY
'The Egyptians took and bought (Joseph).'[SASL corpus, Pretoria_Karina]
- c. ANGEL DVpat++
'The angel woke (the sleeping Joseph).'
[SASL corpus, Potch_Dawie]
- d. EGYPTIAN++ SEARCH+++ GATHER+++ PACK-AWAY+++
'The Egyptians looked for, gathered it, and packed (the grain) away.'
[SASL corpus, Pretoria_Karina]
- e. ht+br
SEVEN YEARS AFTER, START DROUGHT.
'After seven years, the drought began.'
[SASL corpus, Pretoria_Karina]
- f. SIT JAIL #JOSEPH
'Joseph was sitting in the jail.'
[SASL corpus, Pretoria_Japie]

Temporal and spatial modifiers (M) appeared more frequently before the verb, often topic-marked (Sze 2003) as in (8e), than after it (see (9a)), and never in V-initial combinations (*VMS, *VSM). Adjectival adjuncts occurred mainly after the verb (SVA), as in (9b). However, the Pretoria signers also foregrounded adjuncts by placing them before the verb (SAV) for emphasis, as in (9c). SAV order was not observed in the Potchefstroom or George data, and may be borrowed from Afrikaans (see Ponelis 1979: 296, 377, 496).

- (9) a. PRO1S LIVE HERE GEORGE
 'I live here in George.' [SASL corpus, George_Neville]
 b. #JOSEPH WORK GOOD
 'Joseph worked well.' [SASL corpus, Pretoria_Freddie]
 c. #JOSEPH DREAM INDEED HAPPEN
 'Joseph's dream actually came true.' [SASL corpus, Pretoria_Karina]

Explicit simple (direct or indirect) objects appeared more frequently after the verb (SVO=339, i.e., 26%), as in (10a), than before it (SOV=105, i.e. 8%), as in (10b). Plain verbs strongly preferred SVO structure (SVO: 74%; SOV: 26%). Phonologically complex verbs (agreement verbs, motion verbs, and classifier constructions) also strongly preferred SVO structure (SVO: 78%; SOV: 22%) (see

Wehrmeyer (2023) for a description of verbs in SASL). Hence, the data does not support Napoli & Sutton-Spence's (2014) second generalisation. The SOV structure was occasionally used to emphasize the verb, as in (10c) (RAPE is articulated larger than normal in signing space, indicated by '!', and accompanied by NMMs). Complex objects R and destinations K were almost always clause-final (i.e., SVR, SVK combinations), as in (10d), and deviations are possibly ungrammatical.

- (10) a. FATHER LOVE #JOSEPH
'The father loved Joseph.' [SASL corpus, Pretoria_Karina]
- b. PRO3P MONEY DVput-in-sacks
'He put the money into the sacks.' [SASL corpus, Pretoria_Dewald]
- c. br+mg
INDEX #JOSEPH PRO1S WANT RAPE!
'Joseph wanted to rape me!' [SASL corpus, Pretoria_Karina]
- d. ht+br
MOTHER PRO1S SEND! SCHOOL HEARING
'My mother sent me (implication of far away) to a school for hearing children.'
[SASL corpus, Potch_Senzekile]

Objects appear infrequently before the subject (OSV=31, i.e., 2%; OVS=10, i.e., 1%; VOS=2, i.e., 0.2%), and these orders are therefore marked. In all 41 clauses exhibiting O-fronting (OSV, OVS), the object was also the current topic, as in Examples (11a) and (11b), and was also topic-marked by head-tilt and brow raise. In (11c) (VOS), the emphasis is on the predicate. For both S-initial and O-initial clauses, the data indicate that topicality determines what argument comes first.

- (11) a. ht+br
INDEX #JOSEPH OTHER MAN BUY
'Another man bought Joseph.' [SASL corpus, Pretoria_Karina]
- b. ht+br hs
DEAF UNDERSTAND PRO3P
'They don't understand deaf people.' [SASL corpus, George_Daniel]
- c. ht
INTERPRET DREAM PRO3S
'He interpreted my dream.' [SASL corpus, Pretoria_Karina]

Twelve clauses evidenced SVOV order, where the first verb was from the established lexicon and the second from the productive lexicon, as in (12a), where the second verb involves constructed action. Eight split-sentence constructions (SVOV₁) were observed (12b), of which four involved constructed action, as in (12c), where the eagle and the boy are depicted simultaneously due to the visuo-spatial modality. The signer's facial expression, right arm, and torso signify the boy, whereas the left handshape is an entity classifier signifying the eagle. Eleven clauses involved a modal verb as the first verb in a SvOV construction (12d), whereas six involved SvVO constructions (12e). In Example (12d), the sign glossed as *MUST* is articulated larger than usual in the signing space, indicating the brothers being forced against their will. Most of the SvOV constructions were from the Pretoria group, indicating possible borrowing from Afrikaans (in Afrikaans, the presence of any auxiliary verb results in an SvOV structure, see Ponielis (1979: 241–253)), whereas the Potchefstroom group was mainly responsible for the SVOV and SVOV₁ constructions.

- (12) a. #JOSEPH HIDE MONEY DVput-in-sack
'Joseph hid the money in the sacks.' [SASL corpus, Pretoria_Dewald]
- b. ANGEL EXPLAIN #JOSEPH UNDERSTAND
'The angel told Joseph, and Joseph understood.'
[SASL corpus, Potch_Dawie]
- c. INDEX BOY EAGLE DVflap-wings++
fr+mg
DVrun-shield-face(RH) +CL5:eagle(LH)
'The boy ran from the eagle flying above him, shielding his face with his arm.'
[SASL corpus, Potch_Senzekile]
- d. #HEROD WANT PRO2S KILL
'Herod wants to kill you.'
[SASL corpus, Potch_Dawie]
- e. ht
BROTHER++ MUST! LEAVE ONE BROTHER JAIL
'The brothers had to leave one brother in jail.'
[SASL corpus, Pretoria_Karina]

Further analysis of the data revealed eleven locative constructions, all from the Potchefstroom dataset. Four were classified as SVO, as in (13a), four as SOV, as in (13b), two as SVOV (13c), and only one as OVS (13d), where the larger inanimate object is expressed first. All involved animate subjects. Example (13d) involves a previously introduced classifier construction of a man on horseback as subject (right and left hands touching and moving together as a single entity). That the subject is phonologically complex is probably the reason why it appears clause-finally.

- (13)
- a.

DOG CL2:jump-against@CLb:surface TREE

‘The dog jumped up against the tree.’

[SASL corpus, Potch_Maria]
- b.

FROG CLb:go-under@CLb:surface WATER

‘The frog went under water.’

[SASL corpus, Potch_Maria]
- c.

GIRL CL2:stand LOG CL2:stand-on@CLb:log

‘The girl stood on the log.’

[SASL corpus, Potch_Abram]
- d.

FENCE CL2:jump CL2:person@CLb:horse

‘The man on horseback jumped the fence.’

[SASL corpus, Potch_Alfred]

The frequency distributions of clauses containing at least two arguments (SVO, SOV, OSV) are given in Table 3 and Figure 2. Infrequent occurrences (SVOV, VSO, OVS, VOS,, SVOV_i) are collected under ‘Other’.

Table 3. Frequency distributions of clauses with at least two arguments

Sign order	Pretoria	Potch	George	Mean %
SVO (= SVO + SVR + SVK)	266 (77%)	159 (67%)	62 (73%)	72%
SOV (= SOV + SvOV)	56 (16%)	42 (18%)	18 (21%)	18%
OSV	20 (6%)	9 (4%)	1 (1%)	4%
Other	5 (1%)	29 (12%)	4 (5%)	6%
Total	347	239	85	671

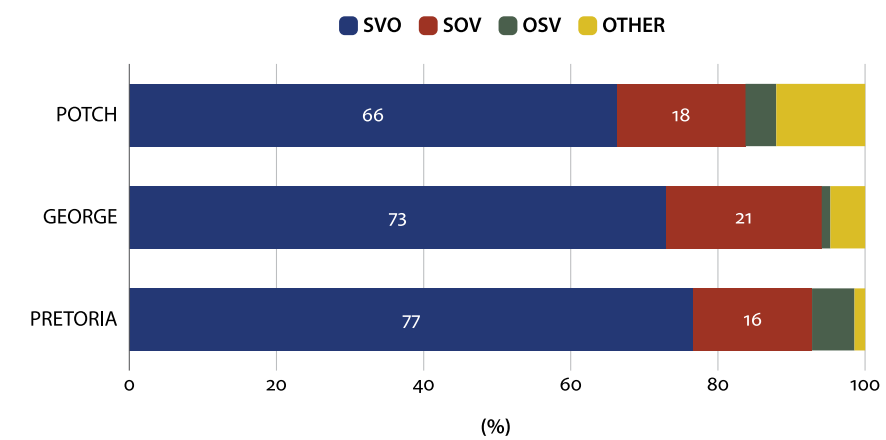


Figure 2. Frequency distributions of clause patterns in SASL

The data indicates that SASL is an SVO language. The SVO pattern dominated even when only simple objects (i.e., excluding combinations containing K and R) were taken into consideration (Pretoria: 70%; George: 70%; Potch: 62%), whereas SOV patterns were similar (Pretoria: 21%; George: 22%; Potch: 20%).

The Potch signers produced less SVO (and more ‘Other’) combinations than the other two groups. However, differences between SVO and SOV for the three communities are not significant. The categories OVS and “Other” had to be excluded from the chi-squared test as their frequencies were too low. (Considering only simple O and O1: $\chi^2(2, 444) = 0.0967$, $p = .953 > .05$; considering O, O1, R and K: $\chi^2(2, 603) = 1.61$, $p = .447 > .05$). The chi-squared test was also performed for SV, SVO, and SOV over the three groups. Again the differences are not significant ($\chi^2(4, 1233) = 9.2996$, $p = .054 > .05$). The results therefore affirm a universal underlying grammar for SASL despite known regional lexical variation.

Considering only SVO, SOV, and OSV clauses and simple objects O1 and O, nonreversible clauses constitute 57% of SVO structures, 70% of SOV structures, and 69% of OSV structures (see Table 4 and Figure 3). The differences between reversible and nonreversible clauses in terms of structural preference are significant ($\chi^2(2, 375) = 8.156$, $p = .0169 < .05$). Thus, reversible clauses strongly prefer SVO constructions, whereas nonreversible clauses show greater tolerance for SOV and OSV structures. Notwithstanding, 68% of the nonreversible clauses were also SVO.

Table 4. Distribution of reversible and nonreversible clauses in SASL structures

	SVO	SOV	OSV	Total
Reversible	153	32	10	195
Nonreversible	203	74	22	299

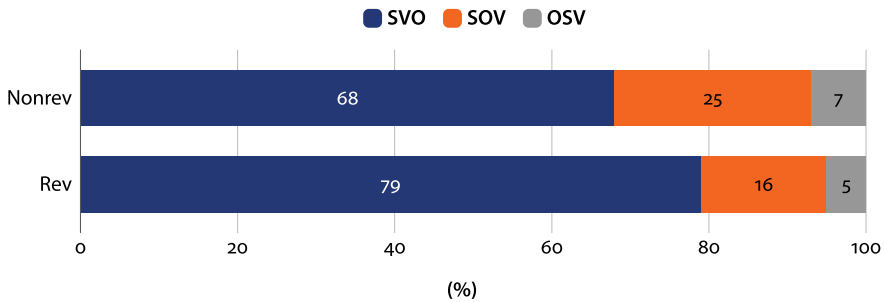


Figure 3. Distribution of reversible and nonreversible declarative clauses in SASL

5.2 Statements with implicit (null) subjects

The data for the 649 statements with null subjects is presented in Table 4. The elided subjects were all manually expressed as topics in immediately preceding clauses or involve body-anchored verbs.

Table 4. Statements with null subjects

Sign order	Pretoria	Potch	George	Total
(S)V	194 (63%)	185 (65%)	16 (24%)	395 (61%)
(S)VO	56 (18%)	38 (14%)	8 (15%)	102 (16%)
(S)VR	14 (5%)	10 (4%)	4 (7%)	28 (4%)
(S)VK	14 (5%)	8 (3%)	9 (17%)	31 (5%)
(S)KV	0	0	2 (4%)	2 (0.3%)
(S)OV	31 (10%)	43 (15%)	16 (26%)	90 (14%)
(S)vOV	1 (0.3%)	0	1 (2%)	2 (0.3%)
(S)RV	1 (0.3%)	0	0	1 (0.15%)
Total	311	284	56	651

Clauses with null subjects mostly contain only a verb ((S)V=61%). Intransitive verbs ($n=218$, i.e., 56%, see (14a)), in particular, body-anchored verbs, accounted for just over half these clauses, whereas in the others, an object was either phonologically encoded in the verb (13%), as in the two clauses in Example (14b), or implied by context (31%). However, unlike those with an explicit subject, clauses with a simple object are almost equally likely to be VO (14c) or OV (14d). Agreement verbs were slightly more frequently observed in OV structures than in VO structures (4% versus 3%), but plain verbs were still by far the majority in both constructions. OV was preferred for clauses with conjoined verbs. Signers also avoided using the (S)vOV structure (where the first verb is a modal verb) if the subject was not explicit. Verbs of cognition (e.g., THINK, SEE, SAY) almost always preceded their complex objects, as in (14e) (see Napoli et al. 2017 for Libras). In (14e), the head movement signals that the signer treats the complex object (a subordinate clause) as a single entity. Similarly, verbs of motion always preceded their destinations, as in (14f) (the NMMs signal that the signer regards the conjoined verbs as belonging to a single clause). These patterns indicate that ‘heaviness’ (Napoli et al. 2017) is a factor, the heavier component being articulated in clause-final position. However, (14f) indicates that the K-final norm is stronger than the heavy-V-final norm.

- (14) a. LEAVE
'(They) left.'
[SASL corpus, Potch_Dawie]
- b. DVput-in-sack, ₁GIVE₂
'(Joseph) put (the grain into sacks), (and) gave (the sacks to his brothers).'
- [SASL corpus, Pretoria_Dewald]

- c. TELL PHARAOH
'(Joseph) told Pharaoh (what his dream meant).'
- [SASL corpus, Pretoria_Freddie]
- d. BROTHERS FIND
'(Joseph) found his brothers.'
- [SASL corpus, Pretoria_Japie]
- e. ht
SEE MANY COME
'(The brothers) saw [many people coming].'
- [SASL corpus, Pretoria_Karina]
- f. ht+br
CL2:walk LEAVE FAR EGYPT
'(Joseph) walked all the way to Egypt.'
- [SASL corpus, Pretoria_Karina]

5.3 Copula clauses

Table 5 presents the sign order for the 498 null copula clauses found in the corpus. As mentioned above, manually expressed copular verbs such as *BECOME* were annotated as V and have been included in the analyses for the preceding sections (see (15a) which is annotated VSO). No manually expressed forms of the verb ‘to be’ were found in the current dataset. However, *INDEX* was used frequently as the empty subject (see Ponelis (1979: 73–77) for a discussion of similar empty subjects ‘*dit is...*’ (= it is), ‘*daar is...*’ (= there is) in Afrikaans copula constructions).

Table 5. Sign order of copula clauses

Sign order	Pretoria	Potch	George	Total
SA	88 (38%)	51 (24%)	21 (32%)	160 (32%)
A	41 (18%)	35 (28%)	7 (11%)	83 (17%)
SS	31 (13%)	50 (16%)	19 (29%)	100 (20%)
(S)A	0	5 (7%)	0	5 (1%)
S	53 (23%)	46 (7%)	13 (20%)	112 (22%)
LOC	1 (0.4%)	4 (5%)	0 (%)	5 (1%)
AS	4 (2%)	6 (6%)	3 (5%)	13 (3%)
(S)S	1 (0.4%)	1 (2%)	0 (%)	2 (0.4%)
MA	5 (2%)	1 (2%)	0 (%)	6 (1%)
SM	3 (1%)	2 (1%)	3 (5%)	8 (2%)
MS	3 (1%)	1 (1%)	0 (%)	4 (1%)
Total	230	202	66	498

The most frequent copula clauses contained adjectival predicates, associating a condition (DEAD, GUILTY, PREGNANT, DEAF, HEARING) with a subject (SA + (S)A + AS = 36%), as in (15b). The inverted order (AS = 3%) was also observed, probably to emphasize the condition (PREGNANT, DEAF), as in (15c). NMMs and pauses signal the null copula. Although more research is needed, it seems that the null copula clauses are articulated similar to topic-comment structures in sign languages in that the ‘topic’ (which can be the subject or the adjectival predicate, depending on what the signer wishes to emphasize) is signalled by a head tilt and sometimes also brow actions, and the position of the elided verb is signalled by a pause and usually also a head nod. Daniel’s delayed head nod in (15b) may be due to the emotional load of the information imparted affecting his syntactic formulation. Signers mostly used SA and AS constructions with animate arguments, but occasionally also with inanimate arguments, see (15d).

- (15) a. $\begin{array}{ccc} & \text{hn} & \text{hn} \\ \text{BECOME PRO}_{2S} \text{ NEW CREATION,} & & \text{NEW PERSON} \end{array}$
 ‘You become a new creation, a new person.’ [SASL corpus, Pretoria_Esme]
- b. $\begin{array}{ccc} & \text{ht+br} & \text{hn} \\ \text{MOTHER FATHER, DEAD} & & \\ \text{‘My parents (are) dead.’} & & \text{[SASL corpus, George_Daniel]} \end{array}$
- c. $\begin{array}{ccc} & \text{ht+fr} & \text{hn} & \text{fr} \\ \text{PREGNANT,} & & \text{PRO}_{3S} & \\ \text{‘She (is) pregnant.’} & & & \text{[SASL corpus, Potch_Dawie]} \end{array}$
- d. $\begin{array}{ccc} & \text{ht} & \text{hn} \\ \text{SIGN,} & & \text{IMPORTANT.} \\ \text{‘Sign (language) (is) important.’} & & \text{[SASL corpus, Potch_Senzekile]} \end{array}$

Second, a single argument was used, often with INDEX, expressing “there is” (S + SM + MS = 25%), to identify someone or something (deictic INDEX), as in (16a). Single nominal predicates were often accompanied by locative adjuncts, as in (16b), to express the status quo (existential INDEX). (See Ponelis (1979:106f) for a discussion on similar constructions in Afrikaans.)

- (16) a. $\begin{array}{ccc} & \text{h(left)+fr} \\ \text{INDEX DREAM++ , INDEX} & & \\ \text{‘There’s that dreamer!’} & & \text{[SASL corpus, Pretoria_Japie]} \end{array}$
- b. $\begin{array}{ccc} & \text{hs} \\ \text{INDEX AREA, WHEAT} & & \\ \text{‘Around here there isn’t any wheat.’} & & \text{[SASL corpus, Pretoria_Freddie]} \end{array}$

The third most frequent use of copula constructions was to establish a (referential) relationship of identity between two arguments (SS + (S)S = 20%), one of the arguments (e.g., NAME) functioning as nominal predicate. Signers usually used the construction to name people and places (identity relationship), as in Exam-

ples (17a) and (17b). (In (17a), Karina also mouthes the copula simultaneously while articulating the pronoun, which she emphasizes through repetition.) However, the Pretoria signers sometimes combined referential and descriptive relationships, as in (17c).

- (17) a. br
PRO1S++_V(is), #JOSEPH, PRO1S
'I am Joseph.' [SASL corpus, Pretoria_Karina]
- b. ht+br
SCHOOL NAME, #BARTIMEA
'The name of the school was Bartimea.' [SASL corpus, Potch_Dawie]
- c. ht+br ht
#JOSEPH LOVE! KISS! SON_a INDEX #JAKOB
'Joseph (is) Jacob's beloved son.' [SASL corpus, Pretoria_Karina]

Fourth, a single adjectival predicate (A=17%, e.g., FINE, GOOD) was used to express a condition (i.e., 'demonstrative that'), either positively as in (18a) or negatively, as in (18b) (see Ponelis (1979: 77) for similar Afrikaans constructions). The construction occurred nine times with locative adjuncts (18c), and once as a fixed expression (18d).

- (18) a. hn hn
INDEX, GOOD, INDEX.
'That's good.' (= Okay, I'm done with that.) [SASL corpus, Pretoria_Dewald]
- b. hs
IMPOSSIBLE
'That's impossible.' [SASL corpus, Pretoria_Karina]
- c. INDEX AROUND EGYPT, DRY.
'There around Egypt, it is dry.' [SASL corpus, Pretoria_Dewald]
- d. WRAP (metaphor articulated by tying a ribbon vertically around a box while looking and smiling at the audience).
'That's a wrap!' (meaning: 'I'm finished.') [SASL corpus, Potch_Senzekile]

Finally, locative copula constructions (LOC=5, i.e., 1%) occurred rarely, and were mainly used with lexicalised prepositions (CLOSE-TO, NEXT-TO) to describe geographical locations of smaller towns relative to well-known locations, as in (19a). Only one other locative copula construction (annotated as S) was observed (19b), where the signer articulated the sign BLOOD above the palm of her left hand.

- (19) a. $\frac{\text{fr}}{\text{PLACE \#THABA HYPHEN \#NCHU INDEX NEXT-TO \#OB}} \frac{\text{ht+br}}{\text{'The town Thaba 'Nchu is close to Bloemfontein.'}} \frac{\text{fr}}{\text{[SASL corpus, Potch_Dawie]}} \frac{\text{hn}}{\text{[SASL corpus, Pretoria_Karina]}}$
- b. BLOOD@CLb:hand++
'There is blood on your hands.' [SASL corpus, Pretoria_Karina]

6. Discussion

In order, the most common constructions in the current SASL corpus are: SV (26%), SVO (20%), (null) copula constructions (20%), (S)V (16%), (S)VO (7%), SOV (4%), (S)OV (4%), and OSV (1%). Other constructions occur rarely (< 1%). The most common pattern for SASL clauses containing explicit subjects and a verb is SV (45%), followed by SVO (39%), followed by SOV (10%). Similarly, the most common pattern for SASL clauses with elided subjects is (S)V (61%), followed by (S)VO (25%), then (S)OV (15%). Clauses with at least two simple arguments and a verb strongly prefer SVO (67%), followed by SOV (21%), then OSV (4%). Therefore, although a larger sample is needed to represent the population of SASL users across the country, the findings indicate that SASL is an SVO language, or more generally, a V-2 language (see Porelis 1979: 495), in that the default position of the main verb in the clause core is at position 2. Other clause structures can therefore be regarded as marked.

Hence, reflecting on Napoli & Sutton-Spence's (2014) generalisations for clauses with a manually expressed subject, the study indeed finds that both SVO and SOV structures exist in SASL and are considered by signers to be grammatical (Generalisation 1), but that the SVO structure is preferred. Moreover, the study found that phonologically complex verbs (agreement verbs, motion verbs, and classifier constructions) were more likely to occur in SVO constructions, thereby contradicting Generalisation 2. Predicates associated with constructed action ("whole-body mimes", see Wehrmeyer 2023) and complex predicates also preferred clause-final positions. Generalisation 3, according to which single-argument structures are the most common, is strongly evidenced in the present study (see Börstell et al.'s (2016) findings for SSL). The study also finds that VS constructions are not common and are mainly restricted to existential verbs such as HAPPEN.

Sixteen locative structures were found in the data, four with lexicalised prepositions describing small towns relative to larger towns or cities. In constructions localising place A in relation to place B, the smaller, lesser-known place was signed first. Of the other locative constructions, only one is OVS. Therefore, although

more data is needed, Napoli & Sutton-Spence's (2014) Generalisation 4 is not observed. Instead, subject animacy and complexity seem to determine clause order in locative constructions.

Napoli & Sutton-Spence's (2014) Generalisation 5, according to which OV always occurs as a unit, was strongly adhered to except when O is topic-marked (see Quadros 2003 for Libras). The current study also affirms Napoli & Sutton-Spence's (2014) Generalisation 6 that reversible clauses strongly prefer SVO. Non-reversible clauses in the current corpus also preferred SVO, but do show greater tolerance for SOV and OSV structures than do reversible clauses (Hall et al. 2013).

Moreover, the study finds that SASL allows for a relatively high occurrence of elided arguments (see Börstell et al. (2016) for SSL; Kimmelman (2018) for RSL; Quadros (2003) for Libras). Clauses with elided subjects accounted for 26% of the current dataset – 33% excluding copula clauses. In other words, one out of every three simple declarative clauses containing a verb does not contain an explicit subject. Answering the question whether elided subjects in SASL reflect the body-as-subject (Meir et al. 2007) or the body-as-first-person (Oomen & Kimmelman 2019) is envisaged for future research. Moreover, while intransitive verbs accounted for approximately 57% of SV constructions, objects phonologically encoded in the verb only accounted for about 7%, meaning that 36% of objects were elided and had to be deduced from context, constructed action, direction of movement, or eyegaze. The current dataset does not contain any instances of independent predicates such as RAIN that do not need at least an implied subject (Kimmelman 2018). Although not the focus of the present study, the corpus data also includes nine instances where verbs of saying were elided in constructed dialogue (see Quadros 2003), mostly by Potchefstroom signers, and three instances where verbs were mouthed instead of being manually expressed.

This is the first study to demonstrate the existence of a null copula in SASL – something that is accepted anecdotally and even taught at schools and universities (since 1994). The null copula is typically signalled by pauses and head nods, and often accompanied by NMMs marking topics or new information. That the null copula is also evident in the signing of older deaf people indicates that the null copula is a natural feature of SASL and not just the result of such constructions being taught since 1994. Copula clauses comprise 19% of the dataset, and were used to describe a subject's condition or status, to identify conditions or persons, and to establish a relationship of identity between two arguments.

In terms of findings specific to SASL reported in the literature, the findings of the present study contradict those of Vermeerbergen et al. (2007) and Van Herreweghe & Vermeerbergen (2012) who found a high frequency of verb-final clauses, and no strong preference between SOV or SVO constructions (OSV and SOV indeed being the most common constructions in their findings). However, I

argue that because these two studies are based on isolated elicited sentences, the participating signers were forced to introduce both arguments as two contrasting topics (see Sze 2003), before being able to express the relationship (usually the verb) between the two topics. That is, I propose that isolated SASL sentences follow a topic₁-topic₂-comment structure, whichever topic most pertinent (semantically or syntactically) appearing at sentence-initial position. This is evident in both the locative constructions and the other simple declarative clauses reported in these two papers. Echoing Napoli & Sutton-Spence (2014), the current corpus-driven study therefore highlights the danger of upholding isolated elicited syntactic constructions as the default constructions of a language. One can relate the difference between the clause structure of elicited isolated sentences and that of naturalistic discourse to Kimmelman's (2012) distinction between syntactic and spatial constructions of locative clauses: in naturalistic discourse, the signer is not sequentially applying grammatical rules, but envisaging and communicating a visual scenario, with actions potentially happening simultaneously. As a creation within the visuo-spatial modality, natural signed discourse has more in common with film studies than with reading or speaking.

The corpus dataset shows that SASL does not solely imitate the structure of spoken languages, but has its own syntactic constructions. For example, conjoined verbs were used to describe multiple simultaneous and even sequential actions. Other unusual (but infrequent) constructions in the current dataset include split-sentence constructions and verb sandwiches. However, some spoken language constructions seem to be borrowed, for example the use of lexicalised prepositions (A NEXT-TO B), clause-final positions of main verbs where an auxiliary verb is present (SVOV), clause-final positions of subjects (VS, AS, MS, OVS, VOS, AVS, MVS), and foregrounding adjuncts by placing them between subject and verb (SMV, SAV). The last three seem to be borrowed from Afrikaans.

An unexplored issue in South Africa is whether all signing communities have a common syntactic and grammatical basis despite obvious regional variation in terms of lexis, with many claiming (unsupported by research) that this is so. The current dataset indicates that there are specific patterns that are used by one or other group, but that differences in how groups employ the most common clause constructions (SV, SVO, SOV, OSV) are not significant, thereby suggesting a common syntactic and grammatical base for SASL.

Finally, the current study provides a basis on which to compare the clause structure of sign language interpreters. Based on Vermeerbergen et al. (2007) and Van Herreweghe & Vermeerbergen (2012), Wehrmeyer (2019b) concluded that a relatively "high" proportion of SV-clauses (49%) and a low occurrence of SO-, OS-, OV-, VS- and VO-constructions (each approximately 4%) in the signed news

interpretations were due to linguistic interference from the spoken language. The relevant data is presented in Table 6.

Table 6. Comparison of natural and interpreted simple SASL declarative clauses

Group	SV/SVO	SOV	OSV/OVS	VSO/VOS/VS	Null copula	Total
SASL corpus	1108 (62%)	116 (6%)	40 (2%)	26 (1%)	498 (28%)	1788
Interpreting corpus (from Wehrmeyer 2019b)	1505 (57%)	129 (5%)	116 (4%)	125 (5%)	743 (28%)	2618

Hence, the SASL interpreters used slightly less SV- and SOV-constructions, and more O- and V-initial constructions than do Deaf SASL signers, but equal proportions of null-copula clauses. However, differences in clause structure distribution between Deaf signers and SASL interpreters are significant ($\chi^2(4, 4408) = 56.975$, $p = 1.25 \times 10^{-11} < .0001$), which may account for Deaf viewers' perceptions that the signed interpretations were somewhat unnatural (see Wehrmeyer 2015b). While linguistic interference possibly accounts for the interpreters' suppression of SOV clauses, the findings indicate that interpreters do not simply follow the structure of the English spoken clauses (which would lead to more SV-structures), but that the act of interpreting influences interpreters' discourse patterns. The comparison illustrates the value of corpora not only for linguistic research of SASL, but also for interpreting research, enabling the detection of interpreting features — so-called “translation universals” (Baker 1993: 233).

7. Conclusion

This study presents the first corpus-driven description of SASL and also the first description of simple declarative clauses in SASL. Based on narratives performed in a naturalistic setting, this study affirms a basic SVO structure for SASL and that Napoli and Sutton-Spence's (2014) generalisations 1, 3, 5 and 6 also seem to apply to simple SASL declarative clauses. However, the findings further indicate that clause structure is influenced by considerations such as topicalisation, animacy, nonreversibility, and phonological heaviness, rather than being an inherent property of verbs (cf. Kimmelman 2018). The study also revealed that SASL exhibits a high tolerance for elided arguments, and demonstrates the existence of the null copula in SASL. The study contradicts previous findings for SASL clause constituent order based on elicited data, thereby confirming the need for linguistic study of whole passages of discourse rather than relying on isolated sentences.

The study also supports the argument for a common syntactic structure underpinning SASL, despite regional lexical variation.




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Appendix. Annotation conventions

Manual signs

- PRO1S, SASL uses specific handshapes for first person singular (glossed as PRO1S), first etc. person plural (glossed as PRO1P), and third person plural (glossed as PRO2P). The pointing sign (glossed as INDEX) is used for second and third person singular (but glossed in the examples as PRO2S and PRO3S for consistency).
- _aGIVE_b Subscripts accompanying verb signs indicate initial and final locations of movement, respectively; numbers indicate person. Subscripts accompanying noun signs indicate the location at which they are articulated. Default articulation at the centre of signing space is not annotated.
- DV indicates depicting verbs.
- ! indicates exaggerated articulation (using larger signing space than usual, exaggerated facial expressions, head/body movement).
- # indicates fingerspelling. If the full word (e.g., a name) is spelled, the letters spelled are presented in capitals. If the first letter of a personal name is subsequently used in the discourse as a nonce sign to represent the argument, the sign is glossed as #xxxx using small caps, e.g., #JOSEPH.
- [...] in the examples indicates a subordinate clause that functions as a complex object.
- @ indicates interaction with signer's body. In classifier constructions, @ indicates right hand interaction with left hand, e.g., CL2:jump@CLb indicates that a person (represented by CL2 on the right hand) jumps over a barrier (represented by CLb on

the left hand). Occasionally, a classifier construction is used in conjunction with a lexicalised sign, e.g. PAINT@CLb indicates that the signer articulates the lexical sign PAINT with the right hand against a wall (represented by CLb) on the left hand.

- +xxx indicates simultaneous articulation of signs without body interaction, e.g., DVrun-shield-face(RH) +CL5:eagle(LH) means that the signer's right hand represents a boy running away while shielding his face, whereas the signer's left hand simultaneously represents an eagle (articulated by CL5).
- ++ indicates that the sign is repeated (e.g., to express pluralisation); the number of + symbols indicates the number of repetitions.
- Φ indicates an elided argument.

Non-manual markers

- _V(xyz) Mouthing simultaneous with the sign is glossed as SIGN_V(xyz), e.g., FEVER_V(have). All the signers mouthed frequently. Only relevant mouthings are included in the examples.
- b indicates that the signer turns their torso to the left or right.
- br indicates brow raise.
- e indicates that the signer gazes in a particular direction. In the corpus, eye gaze is annotated using the eight points of a compass, but annotation is simplified in the examples to left and right directions. Other eyegaze directions specifically mentioned in the examples include e(RH) = signer looks at his dominant hand and e(audience) = signer looks at the audience.
- fr indicates frown.
- h indicates head movements. In the corpus, head movements are annotated numerically in terms of the eight points of a compass. In the examples cited above, head movements have been simplified to ht = head tilt, h(left) = head turn to signer's left, and h(right) = head turn to signer's right.
- mg indicates a mouth gesture. In the corpus, mouth gestures are coded numerically (1–9) but are here simplified to a general code "mg".

Address for correspondence

Ella Wehrmeyer
 North-West University
 1174 Hendrick von Eck Boulevard
 Vanderbijlpark 1930
 South Africa
 ella.wehrmeyer@nwu.ac.za
<https://orcid.org/0000-0002-2746-0598>



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