

Chapter 3

Object shift in ASL and Libras

Sabine Laszakovits^{a,b}, Ronice Müller de Quadros^c, Emily Jo Noschese^d & Diane Lillo-Martin^{b,e}

^aAustrian Academy of Sciences ^bUniversity of Connecticut ^cUniversidade Federal de Santa Catarina ^dUniversity of Hawai'i ^eHaskins Laboratories

ASL and Libras have an object-shift construction by which the canonical SVO order is changed to SOV. In both sign languages, this ordering is mandatory for V marked with durative/continuative aspect (reduplicated movement), optional for V that agrees with O in locus, and not allowed with plain V. When V agrees with O in handshape, ASL requires OV ordering whereas Libras allows both OV and VO ordering. We present an analysis that derives these data with a combination of syntactic movement of O and violable, equally-ranked PF-constraints as proposed by Bobaljik & Wurmbrand (2012). Unlike Matsuoka's (1997) and Braze's (2004) proposals, we do not move V to a head on the right in violation of the Final-over-final constraint (Biberauer et al. 2014, Sheehan et al. 2017).

1 Introduction

The underlying word order in modern American Sign Language (ASL) and Brazilian sign language (Língua Brasileira de Sinais, Libras) has often been argued to be subject-verb-object (SVO; see Fischer 1975, Liddell 1980, Padden 1983/1988 for ASL; Müller de Quadros 1999, 2003 for Libras), which we adopt here. However, in both languages, word order variations are possible. In this paper, we focus on the construction with the word order SOV, which has been termed “object shift”. This construction differs from topicalization structures like O'SV, VO'S, S'VO, or S'O'V in that the latter contain a prosodic break after the topic (indicated here by an apostrophe) and may contain nonmanual marking (raised brows and a slight upward chin tilt; Liddell 1977, 1980, Padden 1983/1988) during the utterance of



the topic.¹ We restrict our attention to verbs that take a direct object (such as ‘buy X’) and possibly an indirect object (such as ‘send X to Y’), but do not discuss verbs that denote movement to or from a location (such as ‘put X on Z’).²

There are three main triggers for object-shift in ASL and Libras: 1. durative/continuative aspect on the verb, which makes object-shift obligatory; 2. verbal agreement in handshape with the object, which makes object-shift optional in Libras and obligatory in ASL; and 3. verbal agreement in locus with the object, which makes object-shift optional in both languages. The effect of durative aspect on word order is illustrated in (1–2).^{3,4}

- | | | | |
|-----|----|---|---------------|
| (1) | a. | IX1 WINE DRINK[asp].
‘I drank wine continuously.’ | ✓ASL, ✓Libras |
| | b. | *IX1 DRINK[asp] WINE. | *ASL, *Libras |
| (2) | a. | MY SISTER LETTER SEND[asp].
‘My sister repeatedly sent a/the letter(s).’ | ✓ASL, ✓Libras |
| | b. | *MY SISTER SEND[asp] LETTER. | *ASL, *Libras |

¹Fischer (1990) argues that object-shift constructions in ASL involve “mini-topicalization” of O to some intermediate specifier position. She corroborates this analysis by reporting a definiteness effect found in SOV orders, which is typical of topics. However, unlike typical topicalizations, SOV constructions lack a prosodic break after O and cannot mark O with nonmanual topicalization marking. Our analysis is similar to Fischer’s in that we think O moves to some intermediate specifier position. However, we have not been able to reproduce this definiteness effect for ASL, and we see no reason to call this movement topicalization.





²Furthermore, we distinguish object-shift from locative constructions of the form location-subject-predicate, which have been taken as instances of the word order OSV because, like object-shift, they lack the prosodic break of topicalization structures (Liddell 1980). Locative constructions differ from object-shift constructions at least in the following properties: (i) the word order is OSV (vs. SOV), (ii) the predicate is restricted to ‘is located at’ (vs. any verb), and (iii) there is no minimally different derivation with the word order SVO (which there is for object-shift; see e.g. (4–7) and throughout the paper).

³Following standard practice in sign linguistics, signs are glossed using English words in all caps. Most of our examples represent sign sequences that are grammatical in both ASL and Libras, though the actual signs are of course different. ‘IX’ is the gloss used for a pointing indexical sign which serves pronominal functions. ‘[asp]’ indicates an aspectual marker involving reduplication of the sign root. ‘[hs:_]’ indicates the use of a classifier handshape. ‘[loc:_]’ indicates that a sign is produced using a spatial locus other than default (‘a’, ‘b’, etc. indicate distinct loci but not physical location). ‘[dir:_→_]’ indicates that a sign moves from one locus to another.

In the English translation, past tense is used although neither ASL nor Libras has grammatical tense marking; similarly, we often use ‘a/the’ for nouns because in both of these sign languages either translation is possible.

⁴When a source is not provided, the judgments primarily come from the 2nd and 3rd co-authors, who are native signers of Libras and ASL respectively.

Verbal agreement can target the object's noun-class⁵, whereby V changes its handshape ('hs') to a classifier as illustrated in (3), or it can target the object's referent, whereby V changes the end-point of its movement ('dir') to the object's locus ('loc'), as seen in (4).⁶

- (3) The handshape of 'GIVE' changes to the  handshape indicative of handling an apple.
- a. SALLY APPLE GIVE[hs:]. ✓ASL, ✓Libras
 - b. SALLY GIVE[hs:] APPLE. ✓Libras
 - c. *SALLY GIVE[hs:] APPLE. *ASL
 all: 'Sally gave someone a/the apple.'
- (4) The direction of 'HELP' changes to the locus of 'ANA'.
- a. IX[loc:a] MARIA[loc:a] IX[loc:b] ANA[loc:b] HELP[dir:a→b].
 (from Müller de Quadros et al. 2004: 6) ✓Libras, ✓ASL
 - b. IX[loc:a] MARIA[loc:a] HELP[dir:a→b] IX[loc:b] ANA[loc:b].
 (from Müller de Quadros et al. 2004: 5) ✓Libras, ✓ASL
 both: 'Maria helped Ana.'

For some verbs, locus agreement involves signing the verb at the object's locus as illustrated in (5) (termed "locationality" by Fischer & Gough 1978, "spatialization" by Müller de Quadros et al. 2004, and "co-localization" by Lourenço & Wilbur 2018; see also Bergman 1980, Liddell 1980, Costello 2015, Smith 1990, i.a.; ASL & Libras), or by adding an auxiliary as in (6) (Libras only; Müller de Quadros 1999). We will treat all of these options as locus-agreement strategies and postulate a uniform syntax.

- (5) Spatialized plain verbs
- a. MAN BICYCLE[loc:a] BUY[loc:a]. ✓ASL, ✓Libras
 (from Müller de Quadros et al. 2004: 9)
 - b. MAN BUY[loc:a] BICYCLE[loc:a]. ✓ASL, ✓Libras
 (from Müller de Quadros et al. 2004: 9)
 both: 'The man bought a/the bicycle.'

⁵In this sense we follow Benedicto & Brentari's (2004) proposal, whereby classifiers are treated as a type of agreement between V and O/S.

⁶Fischer (1975) proposed that object-shift is also licensed if the relation between V and O is established in the semantics, such that SOV is possible only if it is clear from the semantics of V, S, and O which argument is the agent and which is the patient. However, Liddell (1980) showed that this approach makes incorrect predictions, and that syntactic agreement is a better way to go.

(6) Auxiliary

- a. IX[loc:a] JOÃO[loc:a] IX[loc:b] MARIA[loc:b] AUX[dir:a→b]
SUPPORT. ✓Libras
'Joao supported Maria.' (from Müller de Quadros et al. 2004: 7)
- b. IX[loc:a] MARIA[loc:a] SUPPORT IX[loc:b] LULA[loc:b]. ✓Libras
'Maria supported Lula.' (from Müller de Quadros et al. 2004: 5)

The object-shift construction is not possible if neither trigger is present, i.e., when the verb is "plain", as in (7).

- (7) a. * MAN NUMBER FORGET[plain]. *ASL
- b. MAN FORGET[plain] NUMBER. ✓ASL
'The man forgot a/the number.' (from Liddell 1980)
- c. * IX JOHN SOCCER LIKE[plain]. *Libras
- d. IX JOHN LIKE[plain] SOCCER. ✓Libras
'John likes soccer.' (from Müller de Quadros 1999: 61)

Table 1 presents a summary of the acceptability judgments for the basic order SVO and for the object-shift construction SOV for both ASL and Libras.

Table 1: Comparison of judgments for SVO and OSV

	V[plain]	V[loc:_]	V[hs:_]	V[asp]
ASL	✓SVO ✗SOV	✓SVO ✓SOV	✗SVO ✓SOV	✗SVO ✓SOV
Libras	✓SVO ✗SOV	✓SVO ✓SOV	✓SVO ✓SOV	✗SVO ✓SOV

Several proposals have been made regarding the syntax of object-shift in ASL resp. Libras. The difficulty in providing a satisfactory analysis of this phenomenon seems to stem from the disparate nature and the disparate obligatoriness of the constructions that trigger object shift.

For durative-aspect marking of V, Matsuoka (1997) and Braze (2004) have proposed that object shift arises because aspectual morphology sits on an Asp head, and V must move there, and AspP is right-headed. In Section 3 we will show that there is an empirical and a conceptual problem with this analysis.

An alternative proposal is based on the fact that durative-aspect marking is expressed by reduplication of the verb's movement (Klima & Bellugi 1979). The complexity of a sign's movement corresponds to its phonological heaviness (Brentari

1998), and we know from several spoken languages that there is a preference for phonologically heavy elements to appear late in a sentence (Ross 1967, Williams 2003, i.a.). Brentari (1998) has argued that this preference also applies in the object-shift construction with heavy verbs, but remains agnostic whether the inversion is realized by V moving to the right, or by O moving to the left triggered by V's heaviness, as Liddell (1980) proposed.⁷

However, as we have seen, object shift is also related to agreement between V and O, both noun-class (classifier) agreement (3); and referential (locus) agreement (4–5). These agreement-data are difficult to unify with the aspect-data. If one follows a syntactic proposal for the aspect-data like Matsuoka (1997) or Braze (2004), one has to explain why aspect-marking makes the OV order obligatory, while agreement-marking allows both the OV and the VO order. On the other hand, if one follows a phonology-driven proposal for the aspect-data like Liddell (1980) or Brentari (1998), one needs an independent account for the agreement-data, because changes to V's direction or locus or handshape do not influence V's heaviness (Brentari 1998).

Should the aspect-construction receive an analysis independent of the agreement-construction, then, or is there a way to unify them? We will propose a unified analysis that takes into account both phonological heaviness and syntactic agreement projections. We use Bobaljik & Wurmbrand's (2012) proposal that, for any given derivation and its resulting LF, a combination of inviolable and violable, but equally ranked, PF-constraints determine the best realization of this LF. We will introduce four independently attested PF-constraints and show that they derive the data presented here perfectly. In this way, we demonstrate that object shift in ASL and Libras arises from the interaction of syntax and PF, and we strengthen current assumptions about the size of the verbal domain by making explicit the postulated projections.

The rest of the chapter is structured as follows: In Section 2, we present our analysis in detail and show that it makes the correct predictions. In Section 3, we discuss the alternative proposals by Fischer & Janis (1992), Matsuoka (1997), and Braze (2004), who argue for rightward-movement of V. Section 4 concludes.

⁷Note that according to Brentari's (1998) analysis, locus-agreement per se does not constitute "complex movement", neither if it modifies the locus in which V is signed, nor if it modifies the locus of V's endpoint or starting point. In section 6.5 she discusses how phonological weight units interact with the order of syntactic constituents. In Brentari's model, movement corresponds to prosodic features, and each branching prosodic feature constitutes a weight unit. In ASL, 'GIVE' usually contains only a "direction"-movement, that is one weight unit. Both VO and OV ordering are allowed. When habitual aspect is added, 'GIVE' contains an additional "trill" movement, a total of two weight units. OV ordering is preferred over VO. Exhaustive aspect adds both a "trill" movement and an "arc" movement, totalling three weight units. Now, due to V's heaviness, VO is unacceptable.

2 Analysis

2.1 Phrase structure

Our analysis extends the proposals made by Müller de Quadros et al. (2004), Müller de Quadros & Lillo-Martin (2010), and Gökgöz (2013), who follow the common analysis of object shift in spoken languages (Holmberg 1986 and much work since) and suggest that in object-shift constructions, the order of V and O is inverted by movement of O to the left. Further, we adopt the following insights from the literature:

As stated before, we follow Fischer (1975), Liddell (1980), Müller de Quadros (1999) and many others in assuming that the underlying order of ASL and Libras is SVO. In other words, VP is left-headed.

Regarding agreement with noun-classes, we adopt Benedicto & Brentari's (2004) proposal: For classifier-agreement with O, there is a dedicated phrase ClassOP immediately dominating VP, where the handshape-feature on V is set by V moving to the head of ClassOP and O moving to Spec,ClassOP, followed by Agree between O and V.⁸ If the classifier expressed on V is a handling classifier, there is a second, higher ClassSP responsible for agreement between V and S (Benedicto & Brentari 2004).

For agreement with loci, we adopt the proposal that loci are the realization of morphosyntactic features, similar to the proposals by Neidle et al. (2000), Kuhn (2016), and Pfau et al. (2018). We call the phrase where V agrees with O in locus AgrOP, and assume that it dominates ClassOP or, in its absence, VP.⁹ Similarly,

⁸The feature value that O shares with V is not the handshape feature of O's sign, but O's sign's noun-class resp. information about the shape of O's referent.

⁹Gökgöz (2013) argues that the phrase that objects shift to is in the TP-domain. He elicited word order data where in SOV sentences in ASL, manual sentential negation in preverbal position is rated better between O and V (SONegV) than before O (SNegOV): Assuming that manual negation appears in a NegP and that this NegP marks the edge of the VP-domain, O must raise beyond.

We note that in his Experiment 3, the most accepted placement of manual negation is in sentence-final position for plain V, classifier-agreeing V, locus-agreeing V, and ditransitives agreeing in classifier and locus. (He does not discuss durative/continuative aspect.) We tentatively suggest that the realization of manual (and non-manual) negation may follow similar PF-constraints as the realization of O as discussed in this paper, but we consider an investigation of negation outside the scope of the present proposal.

Gökgöz also presents examples where shifted O has a presuppositional reading, which indicates, in line with Diesing (1992), that O moves out of the VP. This presuppositional effect is also observed in Napoli et al. (2017). We have not collected further data on presuppositional readings of O, but we did test for a definiteness effect of O in ASL (parallel to Scandinavian object-shift; Holmberg 1986) and did not find one.

for directional verbs that contain movement from one locus to another, the end-point referring to S is established by agreement between V and S in a projection AgrSP.

For aspect-marked verbs, we adopt parts of Matsuoka’s (1997) and Braze’s (2004) analysis of the syntax of aspect: When the verb displays durative-aspect agreement (reduplication), V moves to an Asp head. However, we differ from these proposals in the headedness of AspP: We contend that Asp is left-headed, like all verbal projections in ASL and Libras. This allows our proposal to be consistent with the Final-over-Final Constraint (FOFC; Biberauer et al. 2014, Sheehan et al. 2017) as will be discussed in Section 3.2.

The tree in Figure 1 illustrates our assumptions about the phrase structure of ASL and Libras for transitive verbs. Regarding ditransitives like GIVE, which agree with the direct object in handshake, but with the indirect object in locus, we tentatively assume that the phrase that introduces the indirect object is projected between ClassOP and AgrOP. In this way, ClassO will probe down and find O, while AgrO will find IO because it is structurally higher than O.^{10,11}

2.2 Verbal agreement

We make the following assumptions about verbal agreement: In sentences where V agrees in handshape/locus/aspect, V moves to the respective syntactic head (Class/Agr/Asp). This movement is covert. In other words, there is an inviolable constraint at PF stating that it is always the lowest copy of V that will be realized. This is similar to English, where V agrees with T, but fully lexical verbs are never realized in T. Another example of such an inviolable constraint is in Bobaljik & Wurmbrand's (2012) analysis of Quantifier Raising in English: English syntax has scrambling just like German and Japanese, and this movement is visible at LF in all languages, but in contrast to German and Japanese, English PF never pronounces the higher copies, giving rise to QR.

That V does not move overtly is corroborated by the fact that we never see V move past manual negation (8) or adverbs of frequency (9) in ASL and Libras:

- (8) a. IX[loc:a] MARIA[loc:a] NOT HELP[dir:a→b] IX[loc:b] JOHN[loc:b].
 ‘Maria did not help John.’
 ✓Libras, ✓ASL
 (Müller de Quadros et al. 2004: 6)

¹⁰We follow Müller de Quadros et al. (2004) in the assumption that the projections ClassOP, AgrOP, AspP, and ClassSP are only present when the verb shows the respective marking, but nothing in our analysis hinges on this.

¹¹See also the discussion in Pfau et al. (2018) of Nevins’s (2011) proposal.

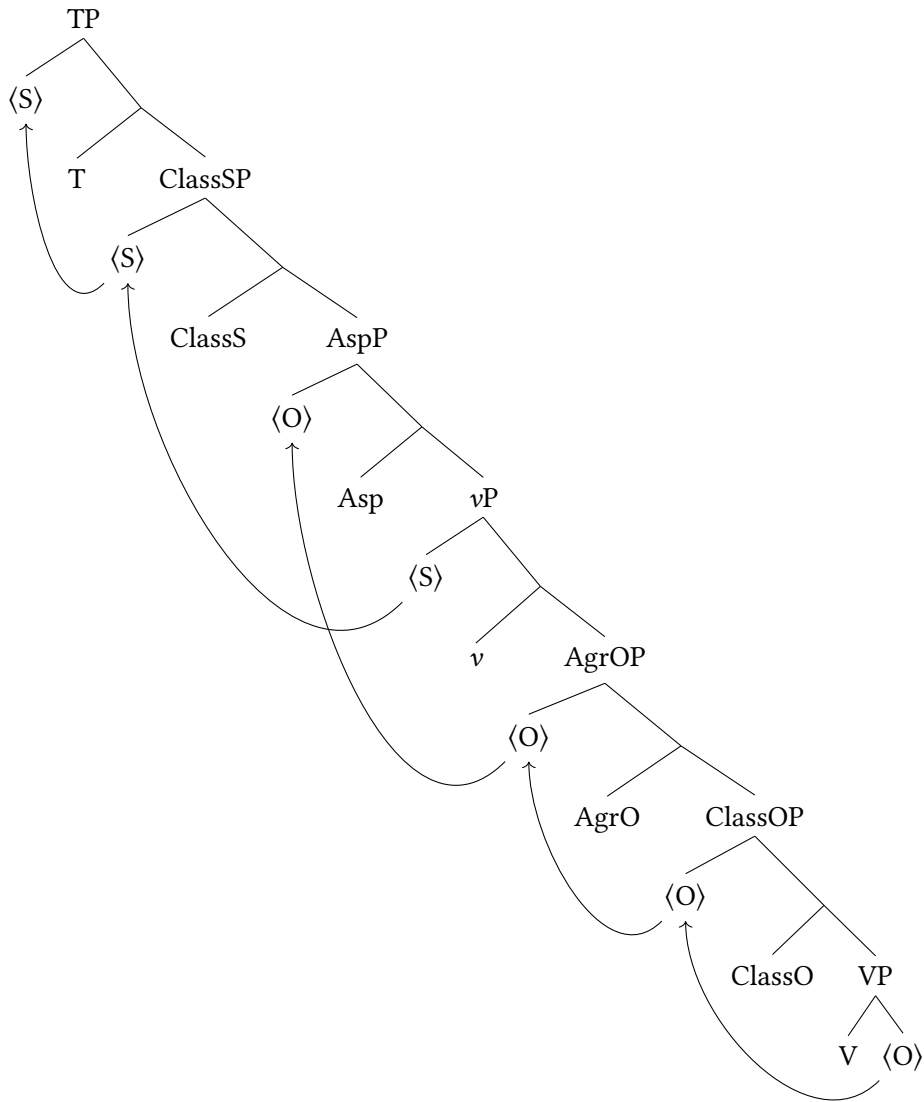


Figure 1: Phrase structure of ASL and Libras

- b. * IX[loc:a] MARIA[loc:a] HELP[dir:a→b] NOT IX[loc:b] JOHN[loc:b].
(Müller de Quadros et al. 2004: 6) *Libras, *ASL
- (9) a. IX[loc:a] MARIA[loc:a] SOMETIMES HELP[dir:a→b] IX[loc:b]
JOHN[loc:b]. ✓Libras, ✓ASL
'Maria sometimes helped John.' (Müller de Quadros et al. 2004: 6)
- b. * IX[loc:a] MARIA[loc:a] HELP[dir:a→b] SOMETIMES IX[loc:b]
JOHN[loc:b]. ✓Libras, ✓ASL
(Müller de Quadros et al. 2004: 6)

When V moves to agree, this triggers syntactic movement of O to the respective specifier position. That is, when V agrees in handshape with O, O moves to the specifier of ClassOP. When V agrees in locus with O, O moves to the specifier of AgrOP. When V agrees in aspect, O moves to the specifier of AspP. Whether this movement of O is overt or covert, i.e. which copy of O gets realized, depends on PF-constraints as we will discuss below. When agreement doesn't take place, the agreement-phrase becomes vacuous, and we assume here that vacuous phrases are not projected at all, but nothing hinges on this assumption.

When V is plain, there is no position for O and V to move to.

2.3 Determining PF

Syntax will thus yield a representation where V has copies in the functional heads it agrees with, and O has copies in the specifiers of the same functional phrases. In line with Bobaljik & Wurmbrand's (2012) framework (which builds on Bobaljik 1995, 2002, Brody 1995, Erteschik-Shir 1997, a.o.), this representation is first sent to LF, and LF decides which copies to interpret, and this will always be the highest copies. Then possible PF-realizations of this LF are evaluated. PF-candidates differ in which copies of V to realize (which is trivial, given the inviolable constraint discussed above) and which copies of O to realize. We propose the following violable and equally-ranked constraints for PF to achieve this. Whichever PF-candidate(s) fulfil the most constraints will be grammatical realizations for this LF.

2.3.1 Scope Transparency ("ScoT")

Bobaljik & Wurmbrand (2012) investigate the connection between the scope of quantifiers and word orders in two sets of languages: one set allows QR and doesn't allow scrambling (e.g. English), and the other set allows scrambling and doesn't allow QR (e.g. German, Japanese). They argue that these properties are

connected in the following way: all languages allow quantifier movement in the syntax and thus at LF, but the two sets of languages differ in which copy of the quantifier they pronounce. Pronouncing the high copy amounts to scrambling and is not available in English, while it is available in German and Japanese. To capture the distribution of QR, Bobaljik & Wurmbrand introduce the violable constraint Scope Transparency (10), which, given an LF with a moved quantifier, favors pronouncing the high copy of the quantifier (scrambling) over pronouncing the low copy of the quantifier (QR). In English, where scrambling is not an option for PF (this is an inviolable constraint), Scope Transparency can be violated, giving rise to QR.




- (10) Scope Transparency (ScoT; Bobaljik & Wurmbrand 2012: 373):

If the order of two elements at LF is $A \gg B$, the order at PF is $A \gg B$.

We use the symbol \gg to represent the canonical manifestation of hierarchical order at the relevant level: roughly, scope at LF [...] and linear precedence at PF [...]. (ibid.)

Bobaljik & Wurmbrand (2012) proceed to phenomena where, given two LF choices and two PF choices, 3 out of the 4 possible combinations are grammatical. They call this the “ $\frac{3}{4}$ signature” and argue that this is the characteristic pattern of the interaction of ScoT with another violable constraint. If both constraints favor the same PF-candidate, this PF will be the “best” PF of the given LF. If the constraints disagree, however, this results in a tie, and both PF candidates are the “best” choice. This pattern is illustrated in Table 2.

Table 2: The $\frac{3}{4}$ signature (Bobaljik & Wurmbrand 2012: 385f.)

LF	PFs	ScoT	Another constraint	Prediction
$A \gg B$	$A \gg B$	✓	✓	2/2 
	$B \gg A$	*	*	0/2
$B \gg A$	$A \gg B$	*	✓	1/2 
	$B \gg A$	✓	*	1/2 

Regarding object-shift in ASL and Libras, we assume syntactic movement of O as explained above, which results in two (or more) copies of O. Since LF always interprets the highest copy of O, we take ScoT to be fulfilled when PF realizes the highest copy of O as well.

2.3.2 Canonical complement order (“CCO”)

We also adopt Bobaljik & Wurmbrand’s second violable constraint called Canonical complement order (CCO), which captures the “cost” of movement that is otherwise “free”, i.e., not required for the derivation to succeed, not feature-driven. Bobaljik & Wurmbrand note (p. 390) that the idea for such a constraint is a fairly old one and used to be called “Case Adjacency” in early GB-models. In the present work, this constraint represents favoring the surface order SVO, which we understand as the underlying order of ASL and Libras, over the derived order SOV.

2.3.3 If O values V, O precedes V (“Value”)

Napoli & Sutton-Spence (2014) have conducted a survey of the order of major constituents in 42 sign languages and discovered one generalization and five tendencies regarding the word order variation between SVO and SOV. We take our cue from their cross-linguistic tendency in (11) (“Generalization 2”).

- (11) If an argument affects the phonological shape of V, it precedes V. (Napoli & Sutton-Spence 2014)

Napoli & Sutton-Spence understand “affecting the phonological shape of V” to include classifier predicates, agreeing verbs, pointing verbs, spatial verbs, and argument-sensitive verbs. Only plain verbs are exempt. Our data for ASL and Libras, as presented above, show that (11) holds only partially in these languages. We certainly observe that O interacting with V enables the word order SOV, which aligns with (11). However, we also observe a distinction between classifier-agreement and locus-agreement, which Napoli & Sutton-Spence bundle together. Let us briefly turn to a discussion about the differences in syntax between these two types of agreement, and why – in ASL – classifier-agreement is more strict (only OV) than locus-agreement (OV or VO). With respect to why Libras differs from ASL here, we remain agnostic at this point, and leave possible consequences of this seemingly parametric difference to future research.

We assume that classifier-agreement and locus-agreement both happen in dedicated phrases as Specifier-Head agreement, such that O moves to the Specifier and V moves to the Head (Benedicto & Brentari 2004, Kuhn 2016). As illustrated above, we term the phrase for locus-agreement AgrOP, and the phrase for classifier-agreement ClassOP. Our proposal is that there is a difference between these two types of agreement in the direction of feature valuation. For classifier-agreement, what determines V’s handshape is information about O’s noun-class. Valuation must thus always proceed from O to V. For locus-agreement, on the

other hand, we argue that valuation can in principle proceed in either direction. The value of the locus (*a, b, c, ...*) is not inherent to either O or V; all that matters for agreement is that they share the same value. In (12) we see that the value does not have to originate from O: V introduces the locus *b* associated with the indirect object of GIVE, while the IO itself is a body-anchored sign that is not assigned a locus (as it might be via IX, eyegaze, head-tilt or shoulder-shift). We interpret this to mean that the locus-feature on the IO is unvalued.

- (12) BOOK, FATHER GIVE[dir:*a*→*b*] MOTHER.^{12,13} ✓ASL, ✓Libras
(constructed after Kuhn 2016: 473)

2.3.4 Phonologically heavier elements come later (“Heavy”)

Verbs marked with durative aspect have reduplicated movement (Klima & Belugi 1979) and are thus phonologically heavier than non-aspect-marked verbs (Brentari 1998). However, verbs marked with locus-agreement or classifier-agreement are not phonologically heavier (Brentari 1998).

This is supported by the following data.¹⁴ In SVO sentences, adverbs can appear in a position on the left (13), or on the far right of the clause (14).

- (13) a. MY SISTER QUICKLY SEND[plain] LETTER. ✓Libras
‘My sister quickly sent a/the letter.’
b. MY SISTER SOMETIMES SEND[plain] LETTER. ✓ASL
‘My sister sometimes sends a letter.’
(14) a. MY SISTER SEND[plain] LETTER QUICKLY. ✓Libras
‘My sister quickly sent a/the letter.’
b. MY SISTER SEND[plain] LETTER SOMETIMES. ✓ASL
‘My sister sometimes sends a letter.’

¹²In this example, ‘BOOK’ is topicalized, as indicated by the comma following it.

¹³Note that the SOV word order is not possible here without locus-marking (eyegaze for Libras; shoulder-shift or eyegaze+headtilt for ASL):

(i) * BOOK, FATHER MOTHER GIVE[dir:*a*→*b*].

We do not go into this further, but we note that there might be two possible reasons for this: ‘FATHER’ and ‘MOTHER’ might need to be differentiated grammatically to ensure that the predicate is non-reversible (which may prohibit the ordering SOV according to Fischer 1974), or ‘MOTHER’ (at least) might need to set the value of the locus feature when to the left of V.

¹⁴In our judgments of ASL, ‘QUICKLY’ is not expressed by a manual sign, so we substituted the ASL adverb ‘SOMETIMES’ for the Libras adverb ‘QUICKLY’.

However, in SOV constructions with aspect-marked V, the adverb cannot appear on the right.

- | | | | |
|------|----|---|---------|
| (15) | a. | MY SISTER QUICKLY LETTER SEND[asp]. | ✓Libras |
| | | ‘My sister repeatedly sends letters quickly.’ | |
| | b. | MY SISTER SOMETIMES LETTER SEND[asp]. | ✓ASL |
| | | ‘My sister sometimes sends letters repeatedly.’ | |
| (16) | a. | * MY SISTER LETTER SEND[asp] QUICKLY. | *Libras |
| | b. | * MY SISTER LETTER SEND[asp] SOMETIMES. | *ASL |

In contrast to aspect-marking, this restriction on the placement of adverbs does not apply to classifier- (17) or locus-marking (18) of the verb.

- | | | | |
|------|----|--|---------|
| (17) | a. | IX1 WINE DRINK[hs:☞] QUICKLY. | ✓Libras |
| | b. | IX1 WINE DRINK[hs:☞] SOMETIMES. | ✓ASL |
| (18) | a. | IX1 HOUSE[loc:a] BUY[loc:a] QUICKLY. | ✓Libras |
| | b. | IX1 HOUSE[loc:a] BUY[dir:1→a] SOMETIMES. | ✓ASL |

2.4 Our account in action

Table 3 illustrates the application of these PF constraints for object shift in ASL and Libras. For any given LF (which differ in the position of where O and V have moved to), the PF candidates of pronouncing the sequence as SVO or SOV are evaluated. The columns labelled with a constraint show whether this constraint is fulfilled (“✓”) or violated (“*”). The prediction is that all candidates with the highest number of constraints fulfilled (indicated with the selector symbol “☞”) will be acceptable, and all candidates with a lower-than-highest count will be unacceptable. The final column displays the actual judgment. It matches the prediction for all rows.

Table 3 illustrates the different outcomes when a plain verb with no classifier-agreement is used, compared to verbs with classifier-agreement. The first two rows present the LF without agreement, i.e. the verb has plain inflection. Since there are no other copies of O and V, only one PF-candidate is available, namely the one with the ordering SVO.

The second two rows present the minimally different LF where classifier-agreement did happen. We see two PF-candidates: the first one spells out the copy of O

¹⁵There is no higher copy of O at LF that PF could spell out. This PF-candidate does not exist and is only given for completeness to illustrate that the ordering SOV[plain] is ungrammatical.

Table 3: No agreement vs. classifier-agreement in Libras

LF	PF candidates	ScoT	CCO	Pred.	Judg.
S	$[_{VP} V_{[plain]} O]$				
	$S [_{VP} V_{[plain]} O]$	✓	✓	☞	ok
	$S [? O [_{VP} V_{[plain]} t_O]]$	Not applicable ¹⁵			*
S	$[_{ClassOP} O V_{[hs:_]} [_{VP} t_V t_O]]$				
	$S [_{ClassOP} t_O t_V [_{VP} V_{[hs:_]} O]]$	*	✓	☞	ok
	$S [_{ClassOP} O t_V [_{VP} V_{[hs:_]} t_O]]$	✓	*	☞	ok

inside the VP, and the second one spells out the copy of O in Spec,ClassOP. Note that we do not need to consider PF-candidates that spell out the higher copy of V, since there is an inviolable constraint requiring lower V to be spelled out. The SVO-candidate does not fulfill ScoT, but fulfills CCO. The SOV-candidate fulfills ScoT, but does not fulfill CCO. We see the $\frac{3}{4}$ signature arising from the interaction of two violable constraints.

Table 4 illustrates classifier-agreement in ASL. Here the constraint “Value” comes into play. It differentiates between the two possible PFs of the second LF, allowing only SOV ordering in ASL with classifier-agreeing V.

Table 4: No agreement vs. classifier-agreement in ASL

LF	PF candidates	ScoT	CCO	Value	Pred.	Judg.
S	$[_{VP} V_{[plain]} O]$					
	$S [_{VP} V_{[plain]} O]$	✓	✓	✓	☞	ok
	$S [? O [_{VP} V_{[plain]} t_O]]$	Not applicable				*
S	$[_{ClassOP} O V_{[hs:_]} [_{VP} t_V t_O]]$					
	$S [_{ClassOP} t_O t_V [_{VP} V_{[hs:_]} O]]$	*	✓	*		*
	$S [_{ClassOP} O t_V [_{VP} V_{[hs:_]} t_O]]$	✓	*	✓	☞	ok

Locus-agreement in both ASL and Libras mirrors Table 3 (because, as argued above, “Value” does not apply to locus-agreement), except that it is less optional for O. I.e., whenever O is associated with a locus and V allows locus-agreement with O, V will agree (Padden 1983/1988; but see the corpus studies by De Beuzeville et al. 2009 for Auslan, Costello 2015 for LSE, and Fenlon et al. 2018 for BSL

showing that while locus-agreement on V with O is more frequent than with S, this is by no means obligatory in these three sign languages).

Aspect-marking on V is also not optional, given that it is the only marking of aspectual information in a sentence. V that is marked with durational aspect modifies its movement to contain a circular motion, which corresponds to phonological heaviness (Brentari 1998). Thus, the constraint “Heavy”, which was fulfilled for all PF-candidates in Tables 3 and 4, differentiates the PF-candidates in Table 5.

Table 5: Aspect-marking in ASL and Libras

LF	PF candidates	ScoT	CCO	Heavy	Pred.	Judg.
S	[_{AspP} O V _[asp] [_{VP} t _V t _O]]					
	S [_{AspP} t _O t _V [_{VP} V _[asp] O]]	*	✓	*		*16
	S [_{AspP} O t _V [_{VP} V _[asp] t _O]]	✓	*	✓	☞	ok

3 Problems with previous proposals

It has been proposed that the obligatory word order change from VO to OV when V carries aspect-marking is due to V moving into a right-headed Aspect phrase to collect this extra morphology. Fischer & Janis (1992) suggested such an analysis, although for verb-doubling constructions of the form SV[plain]OV[asp]. This proposal has then been picked up, refined, and applied to object shift constructions by Matsuoka (1997) and Braze (2004). A verb-doubling construction is illustrated in (19).

- (19) SALLY TYPE[plain] HER TERM PAPER TYPE[asp]. ✓ASL, ✓Libras
‘Sally typed her term paper for a very long time.’ (from Fischer & Janis 1992)

The idea is that the two verbs, which always share the same root, are two realizations of the same chain. The first verb appears in its base position inside VP. The second verb carries additional marking, thus appears in a position with additional morphology, which is the Asp head, which must be on the right given

¹⁶Braze (2004) reports that his consultants like the order SV[asp]O and dislike the order SOV[asp]. This may be due to an influence of English on ASL, as Matsuoka (1997) notes, or it could be dialectal variation within ASL, as Braze suspects, or both.

this construction's word order. Matsuoka (1997) proposes the derivation in Figure 2. In a verb-doubling construction, both copies of V are pronounced: the copy inside VP in its plain form, and the copy in Asp with aspect-marking.

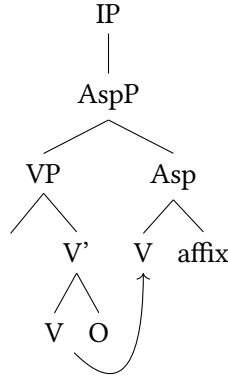


Figure 2: Matsuoka's (1997) analysis of aspect-marked verbs

We reject this analysis on two grounds: one empirical and one theory-internal, which we discuss in turn in Sections 3.1 and 3.2.

3.1 Adverb placement

The empirical problem with the right-headed-Asp analysis is that it cannot capture the following data for adverb placement, while our PF-based account can.

In general, adverbs can appear to the left of V (temporal adverbs before S, as illustrated in (20); adverbs of manner after S, as illustrated in (21)) or to the right of V (in sentence-final position, (22)). We remain agnostic as to whether this is derived via optional left- or right-adjunction of the adverb to TP resp. *v*P, or via extraposition of the adverb.

(20) Temporal adverbs adjoin on the left.

- | | |
|---|---------------|
| a. YESTERDAY MY SISTER SEND[plain] LETTER. | ✓Libras, ✓ASL |
| b. YESTERDAY MY SISTER LETTER SEND[asp]. | ✓Libras, ✓ASL |
| both: 'Yesterday my sister sent a/the letter(s).' | |

(21) Frequency adverbs adjoin on the left.

- | | |
|---|---------|
| a. MY SISTER QUICKLY SEND[plain] LETTER. | ✓Libras |
| b. MY SISTER QUICKLY LETTER SEND[asp]. | ✓Libras |
| both: 'My sister quickly sent a/the letter(s).' | |

- c. MY SISTER **SOMETIMES** LETTER SEND[dir:→1]. ✓ASL
 ‘Sometimes my sister sends me a letter.’
- (22) Adverbs adjoin on the right in SVO clauses.
- a. MY SISTER SEND[plain] LETTER **YESTERDAY**. ✓Libras, ✓ASL
 b. MY SISTER SEND[plain] LETTER **QUICKLY**. ✓Libras
 c. MY SISTER LETTER SEND[dir:→1] **SOMETIMES**. ✓ASL

However, in object-shift clauses with aspect-marked V, adverbs must adjoin on the left. They do not have the option of appearing in sentence-final position. This is illustrated in (23).

- (23) Adverbs cannot adjoin on the right in SOV[asp] clauses.
- a. * MY SISTER LETTER SEND[asp] **YESTERDAY**. *Libras, *ASL
 b. * MY SISTER LETTER SEND[asp] **QUICKLY**. *Libras

That the examples in (23) should be ungrammatical is completely unexpected under the theories proposed by Fischer & Janis (1992), Matsuoaka (1997), and Braze (2004). Why should movement of V to Asp prohibit an adverb adjoining on the right? In contrast to this, our account captures these data perfectly. Since we postulate a PF-constraint stating that phonologically heavy V should be in sentence-final position, SOV-constructions with V[asp] followed by another element are penalized.¹⁷ Our derivations are illustrated in Tables 6 and 7.

Table 6: Adverb-placement options with plain V

LF	PF candidates	ScoT	CCO	Pred.	Judg.
S [VP V O]	S [Adv [VP V _[plain] O	✓	✓	☞	ok
	S [[VP V _[plain] O] Adv]	✓	✓	☞	ok
	S [Adv [? O [VP V _[plain]	Not applicable			*
	S [[? O [VP V _[plain]]] Adv]	Not applicable			*

Our account also correctly predicts that when V is marked with classifier- or locus-agreement, adverb placement is possible on the left as well as on the right. Consider the data in (24–27) and our derivations in Table 8 (given for locus-agreement only; classifier-agreement is completely parallel in Libras, and in ASL the constraint “Value” comes into play additionally).

¹⁷Elements that are typically in sentence-final position and may appear even after V[asp] include the subject pronoun copy. This is outside the scope of this paper, but it seems to us that copying a subject pronoun into the sentence-final position might be an inviolable constraint, taking precedence over the constraints discussed here.

Table 7: Adverb-placement options with aspect-marked V

LF	PF candidates	ScoT	CCO	Heavy	Pred.	Judg.
S	[_{AspP} O V [_{VP} t _V t _O]]					
S	[Adv [_{AspP} t _O t _V [_{VP} V O]]]	*	✓	*		*
S	[[_{AspP} t _O t _V [_{VP} V O]] Adv]	*	✓	*		*
S	[Adv [_{AspP} O t _V [_{VP} V t _O]]]	✓	*	✓	👉	ok
S	[[_{AspP} O t _V [_{VP} V t _O]] Adv]	✓	*	*		*

- (24) Adverb placement with classifier-agreement in Libras
- a. IX1 QUICKLY DRINK[hs:☺] WINE.
 - b. IX1 DRINK[hs:☺] WINE QUICKLY. ✓Libras
 - c. IX1 QUICKLY WINE DRINK[hs:☺]. ✓Libras
 - d. IX1 WINE DRINK[hs:☺] QUICKLY. ✓Libras
- all: ‘I quickly drank wine.’
- (25) Adverb placement with classifier-agreement in ASL
- a. IX1 SOMETIMES DRINK[hs:☺] WINE. ✓ASL
 - b. IX1 DRINK[hs:☺] WINE SOMETIMES. ✓ASL
 - c. IX1 SOMETIMES WINE DRINK[hs:☺]. ✓ASL
 - d. IX1 WINE DRINK[hs:☺] SOMETIMES. ✓ASL
- all: ‘I drink wine sometimes.’
- (26) Adverb placement with locus-agreement in Libras
- a. IX1 QUICKLY BUY[loc:a] HOUSE[loc:a]. ✓Libras
 - b. IX1 BUY[loc:a] HOUSE[loc:a] QUICKLY. ✓Libras
 - c. IX1 QUICKLY HOUSE[loc:a] BUY[loc:a]. ✓Libras
 - d. IX1 HOUSE[loc:a] BUY[loc:a] QUICKLY. ✓Libras
- all: ‘I quickly bought the house.’
- (27) Adverb placement with locus-agreement in ASL
- a. IX1 SOMETIMES BUY[dir:1→a] HOUSE[loc:a]. ✓ASL
 - b. IX1 BUY[dir:1→a] HOUSE[loc:a] SOMETIMES. ✓ASL
 - c. IX1 SOMETIMES HOUSE[loc:a] BUY[dir:1→a]. ✓ASL
 - d. IX1 HOUSE[loc:a] BUY[dir:1→a] SOMETIMES. ✓ASL
- all: ‘I sometimes buy a house.’

Table 8: Adverb-placement options with locus-marked V

LF	PF candidates	ScoT	CCO	Pred.	Judg.
	$S [{}_{\text{AgrOP}} O V [{}_{\text{VP}} t_V t_O]]$				
	$S [Adv [{}_{\text{AgrOP}} t_O t_V [{}_{\text{VP}} V O]]]$	*	✓	☞	ok
	$S [[{}_{\text{AgrOP}} t_O t_V [{}_{\text{VP}} V O]] Adv]$	*	✓	☞	ok
	$S [Adv [{}_{\text{AgrOP}} O t_V [{}_{\text{VP}} V t_O]]]$	✓	*	☞	ok
	$S [[{}_{\text{AgrOP}} O t_V [{}_{\text{VP}} V t_O]] Adv]$	✓	*	☞	ok

3.2 Mixed headedness

The conceptual problem with the proposal that V moves from a left-headed VP to a right-headed AspP is that it violates the Final-over-Final Constraint (FOFC, pronounced [fofk]; see Biberauer et al. 2014, Sheehan et al. 2017, and much subsequent work). The FOFC is an implicational universal over the headedness of phrases within an extended projection. There are 2 types of extended projections: the verbal one containing V, *v*, Asp, Aux, T, C, etc; and the nominal one containing N, Num, Poss, D, etc. The implicational universal FOFC states informally:

- (28) If a phrase in an extended projection is right-headed, all phrases below this phrase in this extended projection are also right-headed. (after Biberauer et al. 2014)

The logical consequence of (28) is (29):

- (29) If a phrase in an extended projection is left-headed, all phrases above this phrase in this extended projection are also left-headed.

Thus, if in a language, CP is right-headed, then TP, *v*P, VP, and all other verbal projections below CP are also right-headed (Figure 3a vs. Figure 3d for $Y = C$). If VP is right-headed, this does not make a statement about the headedness of the next higher verbal projection (Figure 3a vs. Figure 3c for $X = V$). If VP is left-headed, then *v*P, TP, CP, or any other verbal projection higher than VP cannot be right-headed because this would violate (29) (Figure 3b vs. Figure 3d for $X = V$). If CP is left-headed, any headedness is possible for the next lower verbal projection (Figure 3b and 3c for $Y = C$). It is easy to see that the proposal that in ASL, VP is left-headed and AspP is right-headed, is incompatible with the FOFC (Figure 3d for $X = V$ and $Y = \text{Asp}$).

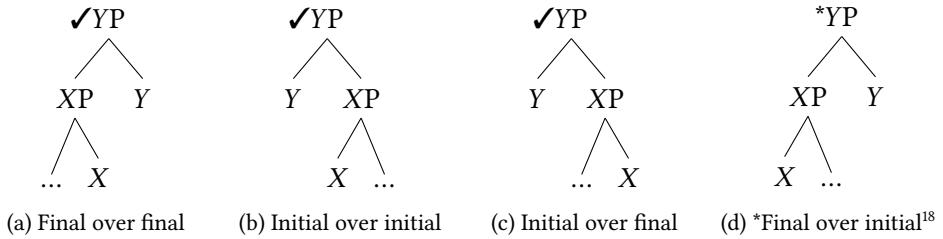


Figure 3: Possible and impossible headedness combinations

The FOFC is well-motivated based on a variety of synchronic and diachronic cross-linguistic studies, connected to other linguistic universals, finds support in processing and language acquisition, and fits in well with current assumptions in Minimalism (see arguments provided in Biberauer et al. 2014, Sheehan et al. 2017, and many other works). We believe that an account that is compatible with the FOFC should on conceptual grounds be preferred over an account that violates it.

4 Conclusions

In this paper, we have proposed a novel account for object shift in ASL and Libras. Like accounts of object shift in spoken languages (Holmberg 1986 and many others), and expanding the proposals for ASL & Libras by Müller de Quadros (1999), Müller de Quadros et al. (2004), Müller de Quadros & Lillo-Martin (2010), Gökgöz (2013), we assume that the reversal of V and O happens in the syntax by overt movement of O. We have amended this syntactic proposal by violable constraints at PF, following Bobaljik & Wurmbrand’s (2012) framework, which determine the copy of O that will be realized at PF. This captures the object-shift paradigm, whereby object-shift is always triggered by aspect-marking, always triggered by classifier-agreement in ASL, optionally triggered by classifier-agreement in Libras, optionally triggered by locus-agreement in both languages, and unacceptable otherwise. Furthermore, we have shown that our theory makes better predictions than the competing proposal by Fischer & Janis (1992), Matsuoka (1997), Braze (2004), who argue that the reversal of V and O happens by movement of V into a right-headed Aspect phrase. We have shown data from adverb placement that is problematic for their proposal but derived perfectly in our theory; and we have given a theory-internal argument against assuming a right-headed Aspect

¹⁸The FOFC is unintuitively named, as the configuration Final-over-final in Figure 3a does not stand out in the paradigm. However, the name can be understood as: [Topic Final] over [Focus Final] Constraint, saying that if YP is head-final, XP must be head-final as well.

phrase dominating a left-headed VP – namely that it violates the implicational universal FOFC.

In this way, we have provided additional evidence for the number of verbal projections in ASL and Libras, thereby for the size of the VP-domain, and for the importance of considering PF-constraints in the investigation of syntactic phenomena.

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