

MA Major Research Paper

Wh-movement in British Sign Language

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1. Introduction

British Sign Language (BSL) is the language of the D/deaf community of the United Kingdom and Northern Ireland (UK)¹. BSL serves as the language of a thriving, vibrant D/deaf culture in the UK, in which it is used in the same range of genres as any other natural language; in formal settings, day-to-day conversations, the arts, and so on. BSL enjoys a high degree of institutional support, and there are a number of entities which encourage the language's continued use (Deuchar, 1984: 33-45); it is estimated that between 80 000 and 100 000 D/deaf people use BSL in England alone (Rogers et al., 2018: 2).

The linguistic study of BSL began in the late 1970s, when prominent researchers such as James Kyle, Bencie Woll and Margret Deuchar described aspects of BSL syntax and phonology previously unrecorded. These efforts were initially to augment education opportunities for D/deaf individuals in the UK (Woll et al., 1981: 105), though BSL linguistics would eventually become an independent area of study, spearheaded by those first researchers, and later prominent linguists such as Rachel Sutton-Spence. Contemporary BSL linguists have established themselves at the forefront of sign language research and documentation: one of the most impressive achievements in sign language documentation, the British Sign Language Corpus Project (BSLCP), aims to document and transcribe various aspects of BSL linguistic variation. The team behind the BSLCP is composed of Kearsy Cormier, Adam Schembri, Jordan Fenlon, Gabrielle Hodge, Sannah Gulamani, Neil Fox, Heidi Procto, and Matt Brown.

Following in the footsteps of these researchers, this project describes aspects of wh-movement in BSL. As is to be seen, wh-movement is a particularly controversial facet of sign language syntax; my objective in the analysis of BSL wh-movement is to determine whether it may provide further insight into key points of interest discussed in recent sign language literature, as well as describe some of its features.

1.1.1 Theoretical Considerations

The following sections will discuss linguistic theories relevant to the analysis of BSL wh-movement in this project. It will focus on antisymmetry theory (Kayne, 1994) and the minimalist program (Chomsky, 1995).

1.1 Antisymmetry theory

Antisymmetry theory, as initially proposed in Kayne (1994), rejects the head-directionality parameter in favor of universal left-headedness. At the core of antisymmetry theory is the Linear Correspondence Axiom (LCA), the main tenet of which is that “asymmetric c-command forces left-right linearization” (Alboiu, 2024: 3). For the purposes of this project, right adjunction and movement is rejected under antisymmetry theory in favor of left adjunction and movement. For an accessible introduction to the

¹ “Woodward (1972) established the convention—now prevalent in the literature—of using the upper- or lowercase letter D/d to classify the status of D/deaf people. ‘Deaf’ people are those who identify themselves as members of the Deaf community and regard themselves as culturally Deaf, whereas ‘deaf’ people are those who do not sign and regard themselves as having a hearing impairment” (Napier, 2002: 1).

concepts presented in Kayne (1994), Barrie (2011, 30-34) summarizes many of the most salient concepts and consequences of antisymmetry theory.

Sign language syntax has been especially problematic in confirming the universality of antisymmetry theory. Examination of American Sign Language (ASL) wh-sign configuration found access to a construction (then thought to be cross-linguistically unusual) wherein two homoreferential wh-elements could be realized circumsententially, seemingly independent of topicalization or dislocation. This discovery led to the scrutinization of a number of other sign languages, many of which were found to have access to the same configuration (Cecchetto et al., 2009: 279). This phenomenon, dubbed the *double construction*, has gone on to spark a long-lasting debate among linguists as to whether antisymmetry theory (or leftward movement in general) accounts for their syntax². Consider the ASL double construction data in (1a-b):

(1a) ASL

_____ wh
WHAT NANCY BUY WHAT
'What did Nancy buy?'

(1b) _____ wh

WHAT NANCY BUY YESTERDAY WHAT
'What did Nancy buy yesterday?'

Petronio & Lillo-Martin (1997: 26-27, ex. 18-19)

(1a-b) demonstrate *WHAT* occurring sentence initially and finally. (1a) shows that circumsentential wh-signs may flank a subject and verb. (1b) shows that the right-most wh-sign may occur lower than the immediate post-verbal position (following *YESTERDAY*), which is the highest position that objects are normally expected to occupy. Due to the surprising positions which wh-signs seemed to be able to occupy, theories of both rightward and leftward movement were proposed to account for sentences such as (1b).

Two groups of linguists emerged on the frontlines of this debate. The most prominent on the side of leftward analysis (or *for* antisymmetry theory) are Karen Petronio, Diane Lillo-Martin and Susan Fischer; on the side of rightward analysis (or *against* antisymmetry theory), Carol Neidle, Debra Aarons, Dawn MacLaughlin, Robert G. Lee, Benjamin Bahan, and Judy Kegl. The theories presented by both sides of the leftward/rightward movement debate have proven consequential not only in sign language studies, but in the discussion of universal grammar as a whole; specifically, whether linguistic medium impacts the availability of syntactic structure.

² Throughout this paper, *double construction* will be used to refer to the phenomenon of circumsentential wh-elements in sign languages. Though the term originates from the leftward-movement camp, the use of *double construction* in this paper does not imply any subscription to it.

1.2.2 Minimalism and minimalism in sign language studies

This project approaches all collected data through the lens of the minimalist program as described in Chomsky (1995). At its simplest, the minimalist program aims to describe syntax with the minimal amount of structure required to accurately account for grammaticality.

Minimalism was employed in the analysis of sign language structures soon after the framework's establishment; in fact, minimalism is the *raison d'être* of both antisymmetry theory (Kayne, 1995: 45) and the counterarguments to antisymmetry theory posited by the rightward movement camp (Neidle et al., 2000: 6). More recent minimalist works in sign language studies, such as Uchibori & Matsuoka (2016), adopt a modified version of the rightward movement hypothesis by incorporating copy theory (Corver & Nunes, 2012) and the expanded left-periphery (Cinque & Rizzi, 2012). The theoretical structures of Japanese Sign Language (JSL) presented in Uchibori & Matsuoka (2016) are adopted in my analysis of BSL wh-non manual marking (wh-NMM) and wh-sign non-dominant manual marking (whs-NDMM). This paper does not initially take a position as to the validity of leftward or rightward movement in accounting for BSL wh-movement; rather, both hypotheses are considered in analyzing the data, and conclusions as to which hypothesis best accounts for that data follow.

1.2 Methodology

The following section details the methodology of this project, including data collection methods and other considerations.

1.2.1 Data collection

All of the collected data for this project was retrieved from the British Sign Language Corpus Project (BSLCP)³. The BSLCP provides raw and analyzed data in BSL, across a range of activities (conversation, narrative, interview and lexical elicitation), regions (Belfast, Birmingham, Bristol, Cardiff, Edinburgh, Glasgow, London, Manchester and Newcastle), age groups (16-19, 20-40, 41-65, and 65+), and ages of BSL acquisition (<7, >7 and 8-12). 100 conversational data entries have been annotated for manual activity and English translations; this data was downloaded as .mov, .eaf, and .eaf.psf files. All occurrences of wh-signs in these 100 conversational data entries were considered, as the conversational files contain the largest amount, most variety and most naturalistic wh-sign usage of all the activities recorded in the BSLCP. Temporal limitations for this project and the researcher's lack of knowledge of BSL syntax or phonetics were also factors in only considering English-transcribed conversational data. All regions, age groups and ages of acquisition were considered.

Collected data was recorded from the BSLCP onto a Google Docs file and arranged in table-format, in which the file name, gloss, English translation, and time of occurrence were recorded. Manual articulation data was collected from the BSLCP gloss in ELAN. Non-manual markings (NMMs) were analyzed from the .mov files provided by the BSLCP

³ My thanks go to the researchers at the BSLCP for their allowance of my use of this data, and the exceptional work they did in organizing and transcribing the data pool.

following the description of BSL wh-NMM and topic-NMM by Sutton-Spence & Woll (1999: 67-89).

1.2.3 Other considerations

This project lacks BSL-signing informants to confirm the grammaticality of utterances. For this reason and the naturalistic syntax presented in the BSLCP, the possibility of missigned entries was not taken into consideration when examining the data.

Due to practicality constraints, this project does not account for variation in BSL wh-movement. This is problematic, as Geraci et al. (2015: 145-148) found significant variation in Italian Sign Language (LIS) wh-sign configuration. The wh-sign variation found by Geraci et al. (2015) in LIS was dependent on signer age, region of origin and education; these may also be salient aspects in BSL wh-sign configuration.

3. Literature review: wh-movement in ASL

This chapter delves into specific points of agreement and contention between the leftward and rightward movement hypotheses. It outlines theoretical aspects agreed upon by both sides of the debate, and the main tenets which differentiate them.

3.1 Points of agreement

Both the leftward and rightward camps agree on the ‘wh-criterion’ as proposed in Rizzi (1991), outlined by Petronio & Lillo-Martin (1997: 21) and shown in (2):

(2) *Wh-Criterion*

- A. A WH-operator must be in a Spec-head configuration with an X^0 [+WH].
- B. An X^0 [+WH] must be in a Spec-head configuration with a WH-operator.

(Petronio & Lillo-Martin, 1997: 21, ex. 6)

Petronio & Lillo-Martin (1997) and Neidle et al. (2000) are also in agreement that wh-movement operates under the functions that govern syntactic movement in general, and that Head movement as described by Roberts (1997) operates identically in sign languages as it does to spoken language. In essence, this means that Heads move to Head positions and phrases move to specifier positions. They agree that movement is necessarily involved in the process of surface string configuration, and that NMMs (as well as NMM-spread) is influenced by syntactic operations (e.g. NMM-spread occurring over elements within the c-command domain of an element endowed with NMM), and therefore provide insight into the syntactic configuration of ASL (Petronio & Lillo-Martin, 1997: 26). While disagreements as to the grammaticality of each others’ data lies at the heart of this debate (Sandler & Lillo-Martin, 2006: 432), there is data which both sides agree is unquestionably grammatical in ASL. Consider the data in (3a-b):

- (3a) ASL
 _____ whq
 JOHN BUY WHAT YESTERDAY
 ‘What did John buy yesterday?’
- (3b) _____ whq
 WHO LIKE NANCY
 ‘Who likes Nancy?’
- (3c) _____ whq
 JOHN BUY WHAT
 ‘What did John buy?’

Petronio & Lillo-Martin (1997: 26, ex. 14-16)

(3a) shows the canonical in-situ position for ASL wh-elements, which is directly following the verb (*BUY*). (3b) demonstrates that wh-subjects may appear in sentence-initial position, and (3c) shows wh-objects may appear in sentence-final position.

Finally, non-wh-elements may be doubled; Petronio & Lillo-Martin (1997: 28) list modals, quantifiers and verbs as lexical categories that also participate in double constructions. (4a-c) exemplify double constructions with each of these lexical categories:

- (4a) ASL
 _____ cond
 ... KNOW PROBLEM SITUATION, CANNOT J-U-R-Y CANNOT
 ‘If [you] are aware of the problem, the situation, then [you] CANNOT be on the jury.’
- (4b) NONE DEAF IN FAMILY BEFORE NONE
 ‘There have not been ANY deaf people in [my] family’
- (4c) __t
 HE HATE LIGHTS-FLASHING-ON HATE
 ‘He HATES the lights flashing on and off.’

(Petronio & Lillo-Martin, 1997: 30, ex. 25, 28, 31)

(4a) shows modals may be doubled; (4b), quantifiers; and (4c), verbs. The following sections will describe the leftward and rightward analyses of wh-double constructions. For reference, Petronio & Lillo-Martin (1997: 27-28) provide diagrams of each side’s analyses, as well as notes of their main points of interest, shown in (5):

(5)

The structure of double constructions	
Leftward movement analysis	Rightward movement analysis
- Spec-CP is on the left - Wh-movement is leftward - The final wh-sign is a base-generated double	- Spec-CP is on the right - Wh-movement is rightward - The initial wh-sign is a base-generated topic

(Petronio & Lillo-Martin, 1997: 27, ex. 20a-20b)

3.2 Leftward movement analysis

The basis of the leftward movement analysis stems from decades of linguistic work attributing Spec,CP as being left peripheral, as well as the theoretical plausibility of universal leftward movement (Petronio & Lillo-Martin, 1997: 21). Many of the points presented in this section are lifted from Petronio & Lillo-Martin (1997) and Sandler & Lillo-Martin (2006); combined, these two works summarize more than 15 years of work on leftward movement in sign language. This section describes and summarizes the perspectives of the leftward movement hypothesis on double constructions and discourse strategies.

3.2.1 Doubling constructions & null elements

Petronio & Lillo-Martin (1997: 32) analyze double constructions as the leftmost element occupying Spec,CP, and the rightmost element being a base-generated ‘twin’ occupying [+F] C⁰. In the case of wh-elements in double constructions, a wh-element is optionally moved leftward to Spec,CP, and a twin of the wh-element is base-generated at [+wh] [+F] C⁰. The inability of the rightmost wh-element of double constructions to support phrases is given as proof that the twin is occupying C⁰ rather than Spec,CP (Petronio & Lillo-Martin, 1997: 33). Examples (6a-b) provide evidence that phrasal double constructions result in ungrammaticality⁴:

⁴ The grammaticality of the rightmost elements in double constructions being a phrase in ASL is contested by the rightward movement camp (Neidle et al., 2000: 136).

(6a) ASL

_____ wh
 WHO CAR BREAK-DOWN WHO
 'Whose car broke down?'

(6b) _____ wh

*WHO CAR BREAK-DOWN WHO CAR
 (Intended) 'Whose car broke down?'

(Petronio & Lillo-Martin, 1997: 33, ex. 48a-b)

(6a) shows that ASL double constructions permit an initial wh-phrase (*WHO CAR*) and an identical wh-element to that contained in the wh-phrase (*WHO*) to follow the verb (*BREAK-DOWN*). (6b) demonstrates that a wh-phrase (*WHO CAR*) cannot be doubled, and that it is necessarily the wh-element of the initial wh-phrase that is doubled.

The grammaticality of ASL final wh-subjects, such as that in (3c), is particularly problematic to the leftward movement camp; their framework would not normally accept a wh-subject occurring to the right of its in-situ position. Within their right-occurring C⁰ analysis of ASL, Petronio & Lillo-Martin (1997: 35) account for ASL final wh-subjects as a result of ASL being a radical *pro*-drop language (RPDL)⁵. For this reason, ASL may nullify arguments in certain discourse contexts:

(7) ASL

_____ wh
 NAME

'What's your name?'

(Petronio & Lillo-Martin, 1997: 35, ex. 56)

In (7), both the genitive pronoun (*INDEX₂*) and the object (*WHAT*) are lexically null and wh-NMSM perseverates over the verb. Petronio & Lillo-Martin (1997) postulate that argument nullification accounts for sentence-final wh-subjects, and that "[they] can be analyzed as double questions with a null twin" (Sandler & Lillo-Martin, 2006: 449).

(8) provides the structure of a double construction with a null initial wh-element:

(8) _____ wh

e BUY CAR WHO

'Who bought the car?'

Petronio & Lillo-Martin (1997: 36, ex. 62)

According to Petronio & Lillo-Martin's (1997) analysis, *WHO* is generated and moves leftward to Spec,CP. *WHO* is doubled, and the sentence-initial *WHO* occupying Spec,CP is not lexicalized. The twin of *WHO* occupying C⁰ is lexicalized. Petronio & Lillo-Martin (1997: 36) find this analysis advantageous in accounting for grammaticality judgements: "[...] our analysis can account for the variation in judgments for sentences such as [(8)] when

⁵ Radical *pro*-drop languages have "no restrictions on omission of subject or object pronouns of any kind" (Roberts, 2021: 37).

presented in isolation. A signer who will reject a sentence such as [(8)] when it is presented in isolation will often accept it when it is in the appropriate context [...]”.

3.2.3 Discourse strategies and information structure

Topicalization is used to account for problematic ASL data through leftward movement: “Within sentences ASL productively uses topicalization to front constituents. Topicalization is so common that when a declarative sentence is presented in isolation, many people will reject the underlying SVO order” (Petronio & Lillo-Martin, 1997: 46). A translation exercise elicited by Petronio & Lillo-Martin (1997: 47) provides evidence of information structure’s saliency in ASL: “It is relevant to our analysis of WH-questions, to consider how placing old, presupposed information first in a discourse may affect the structure of the WH-questions. Often a presupposition will be given and then a question relating to this presupposition will be asked. For example, when asked for an ASL translation of the English sentence, ‘Who does John like?’, many native ASL consultants constructed multisentence discourses such as those in [(9)]”:

- (9) _____hn __whq
 I HEAR GOSSIP JOHN LIKE SOMEONE WHO
 ‘I heard a rumour that John likes someone. Who is it?’
 (Petronio & Lillo-Martin, 1997: 47, ex. 96)

This phenomenon, analyzed as instances of sluicing by Petronio & Lillo-Martin (1997: 49), is based on Ross’s (2012) description of linguistic elements being recovered across discourse through wh-elements (Petronio & Lillo-Martin, 1997: 48). Therefore, double constructions may be analyzed as two (as in [9]) or three sentences rather than one. Petronio & Lillo-Martin (1997: 49) claim patterns in ASL wh-NMM support this conclusion. Consider (10):

- (10) __wh _____ponder __wh
 WHO JOHN LIKE SOMEONE WHO
 ‘Who? John likes someone? Who?’ Petronio & Lillo-Martin (1997: 49, ex. 104)

Initial and final *WHO* in (10) are analyzed as two sentences due to their split wh-NMM markings, and the intersentential elements as forming a separate sentence due to their ponder-NMM. ASL’s allowance of topicalized elements in sentences with a single wh-element, but not sentences containing two wh-elements, is also significant to the analysis of Petronio & Lillo-Martin (1997):

- (11a) _____ t _____ whq
 COFFEE_i, WHERE BUY t_i
 ‘As for the coffee, where did [you] buy it?’
- (11b) _____ t _____ whq _____ ponder _____ whq
 *JOHN_i WHO t_i LIKE SOMEONE WHO
 ‘John (Who_i?) likes someone. Who_i?’

Petronio & Lillo-Martin (1997: 49, ex. 105, 106a)

COFFEE in (11a) is analyzed by Petronio & Lillo-Martin (1997: 49) as an extracted topicalized element. (11b) shows that under the multisentence analysis, *JOHN* may not be extracted due to its origin in a separate sentence.

3.2.1 Summary of leftward movement analysis

This section has covered several important points of analysis of the leftward movement camp: that leftward-directional movement is a syntactic universal, and therefore extends to sign languages; that double constructions may be accounted for with a ‘twin’, which occupies C⁰; and that information structure may explain instances of right peripheral wh-elements.

Petronio & Lillo-Martin (1997: 54) share their perspective on the intersection of ASL syntax and antisymmetry theory: “In addition to this empirical superiority in accounting for the ASL data presented here, the leftward movement hypothesis further supports the cross-linguistic generalization that true WH-movement and spec-CP are to the left. Our conclusion that ASL does not present a counterexample to this cross-linguistic generalization also supports the idea, as would be expected, that true linguistic universals hold across modalities”.

3.3 Rightward movement analysis

This section outlines the main arguments and supporting data presented by the rightward movement camp, with reference to Neidle et al. (2000) and Neidle et al. (1998). Evidence for right-peripheral CP in ASL will be examined, including obligatory and optional spread of NMSM, gradient variability in wh-NMSM, and leftward wh-phrases as base-generated topics.

3.3.1 Obligatory and optional spread of non-manual syntactic marking

Aarons et al. (1992) posit that cross-clausal wh-NMM spread in ASL is variably obligatory or optional, and that whether wh-NMM spreads depends on the c-command relationship of the wh-element to the other elements in the clause. Under the framework presented by Neidle et al. (1998, 2000), the right-peripherality of Spec,CP accurately accounts for discrepancies in wh-NMM spread, while incorporating the theories of Aarons et al. (1992). Examples (12a-b) demonstrate the variability in wh-NMM spread stemming from a wh-subject occupying Spec,CP, and (12c-d), a wh-subject occupying an in-situ position:

(12a) _____ wh
 [t_i HATE JOHN]_{IP} WHO_i
 ‘Who hates John?’

(12b) _____ wh
 [t_i HATE JOHN]_{IP} WHO_i
 ‘Who hates John?’

(12c) _____ wh
 [WHO HATE JOHN]_{IP}
 ‘Who hates John?’

(12d) _____ wh
 *[WHO HATE JOHN]_{IP}
 ‘Who hates John?’

Neidle et al. (1998: 820, Table 1)

(12a-b) shows that the wh-NMM of wh-subjects occupying Spec,CP may spread over the c-commanded elements or only occur with the wh-element. (12c-d) show that wh-NMM spread is obligatory with in-situ wh-subjects. (13a-b) demonstrates similar behavior from wh-objects:

(13a) _____ wh
 [JOHN SEE t_i YESTERDAY]_{IP} WHO_i
 ‘Who did John see yesterday?’

(13b) _____ wh
 [JOHN SEE t_i YESTERDAY]_{IP} WHO_i
 ‘Who did John see yesterday?’

(13c) _____ wh
 [JOHN SEE WHO YESTERDAY]_{IP}
 ‘Who did John see yesterday?’

(13d) _____ wh
 *[JOHN SEE WHO YESTERDAY]_{IP}
 ‘Who did John see yesterday?’

Neidle et al. (1998: 820, Table 1)

Patterns of wh-NMM spread from wh-objects and wh-subjects function similarly: wh-elements variably trigger clausal wh-NMM spread by taking scope at Spec,CP, and always trigger clausal wh-NMM spread when remaining in-situ, allegedly due to the lack of manual material available in Spec,CP (Neidle et al., 1998: 821). (13c) shows wh-NMM spread from a non-lexicalized wh-element at Spec,CP.

3.3.2 Gradiency of wh-question non-manual syntactic marking

Wh-NMM is similar in function to interrogative prosody in spoken language (Sandler & Lillo-Martin, 2006: 432), and may exist on a gradient of intensity. Neidle et al. (2000: 119) claim the gradient of ASL wh-NMM intensity is optionally dependent on the position of the main wh-element, with maximum intensity wh-NMM either being spread over the entire clause or maximum intensity peaking at “the syntactic location where the [+wh] feature occurs” (likely referring to Spec,CP). Consider (14a-b):

(14a) wh-----wh
⁶
 [[WHO LOVE JOHN]_{TP}[+wh]_C]_{CP}
 ‘What, what does John love?’

(14b) wh-----wh

 [[JOHN SEE WHO YESTERDAY]_{TP}[+wh]_C]_{CP}
 ‘Who did John see yesterday?’

Neidle et al. (2000: 120, ex. 27, 28)

(14a) exemplifies complete clausal spread of maximum intensity wh-NMM, and (14b), maximum intensity occurring over the lexically-null wh-element at Spec,CP. Neidle et al. (2000: 120) claim that the maximum intensity of the wh-NMM occurring after lexicalized material is a strong indicator of right-peripheral Spec,CP.

3.3.3 Initial wh-elements

Neidle et al. (2000, 1998) explain initial wh-signs in double constructions as resulting from base-topic generation, as to not violate the parameters of the rightward movement hypothesis. Wh-elements are generated in IP and move rightward to Spec,CP. A topicalized form of the wh-element is base-generated at Spec,Top. Neidle et al. (1998: 828) present cross-linguistic evidence from Chinese, Japanese and German, all of which have access to base-generated topicalized elements, to support their analysis of wh-topic base-generation in ASL.

3.3.4 Summary of rightward movement analysis

This section has examined optional and obligatory spread of wh-NMM, gradient wh-NMM intensity, and base-generated topics in ASL. Many of these points have been refuted by the leftward movement camp through claims of inaccurate and misinterpreted data. Despite its controversy, the rightward movement hypothesis is still a prevalent framework of contemporary sign language wh-movement analysis and will therefore continue to be considered throughout this paper.

4. Wh-movement in BSL

This chapter describes and analyzes BSL wh-movement through the lenses of the leftward and rightward movement hypotheses. Sentences with single wh-element and sentences with more than one wh-phrase, including perseveration constructions and generic *WHAT*, are examined.

⁶ The intensity of the individual features comprising ASL wh-NMM are represented as this box above the gloss. A solid black coloring represents maximum intensity of wh-NMM articulation, and a solid white coloring represents no wh-NMM articulated.

4.1 Sentences with a single wh-phrase

The data examined in this section includes sentence initial and final single wh-subjects, sentence final single wh-objects, as well as wh-subject and wh-object occurrence in double constructions. Consider the BSL wh-subject data in (15a-d):

- | | |
|---|---|
| (15a) BSL
_____ wh
TAKE WHO
‘Who took it?’ | (15b) _____ top
INDEX ₃ WHAT
‘What is it?’ |
| (15c) _____ wh
WHAT FS:BSC
‘What’s BSC?’ | (15d) _____ wh
WHO ALL WHICH REGION TOP MEDALLION ALL
‘Which country got the most medals?’
‘Who, as in which region, got the most medals?’ |

(15a-b) shows that wh-subjects may occur in sentence-final position, and example (15c-d) shows that wh-subjects may occur in sentence-initial position. Petronio & Lillo-Martin (1997: 36) report that some ASL consultants judge sentence final wh-subjects as ungrammatical. Due to the spontaneous nature of BSLCP conversational data, it is very likely that BSL does not restrict sentence-final wh-subjects as the leftward movement hypothesis claims ASL does. On the other hand, Neidle et al. (2000: 110) claim wh-objects are restricted to final position as a result of right-peripheral Spec,CP. Again, BSL does not exhibit these restrictions. Consider (16a-c):

- (16a) _____ wh
 WHAT TALK
 ‘What do we talk about?’
- (16b) _____ wh
 WHAT INDEX₁ DO (SHOULD INDEX₁ GO)
 ‘What shall I do (shall I go out)?’
- (16c) _____ wh
 WHAT DO WITH WORK (NOTHING)
 ‘What does it got to do with employment?’

(16a-c) provide examples of sentence-initial wh-objects; there are no instances of sentence final wh-objects that were found in the BSLCP.

Neidle et al. (2000: 115-117) account for ASL data presenting sentence-initial wh-elements as resulting from base-generated topics. This analysis is problematic for BSL sentences presenting a single left-peripheral wh-element co-occurring with a non-wh-element in initial position, such as in (17a-b):

- (17a) $\frac{\text{INDEX}_1 \text{ WHAT DO SATURDAY}}{\text{'What did I do on Saturday?'}} \text{ wh}$ (17b) $\frac{\text{INDEX}_3 \text{ HOW LEARN INDEX}_3}{\text{'How did they learn?'}} \text{ wh}$

The initial pronouns in (17a-b) precede their respective wh-elements (*WHAT* and *WHO*). To maintain the rightward analysis, the wh-elements must occupy [Top], and the pronouns (*INDEX₁* and *INDEX₃*), a left-peripheral position higher than [Top]. The rightward movement camp would therefore account for the data in (17a-b) as multiple instances of elements base-generating in CP.

For the leftward analysis, the wh-elements in (17a-b) have either moved from their initial right-peripheral generated position to Spec,CP, or remain in-situ, with the initial pronouns occupying a head position higher than Spec,CP. As established in section 3.2.1, Petronio & Lillo-Martin (1997: 36) account for initial wh-objects as double constructions with a lexically-null final wh-element. BSL presents similar data to that of (7) wherein wh-elements may be lexically-null, as shown in (18a-b):

- (18a) BSL $\frac{\text{DAUGHTER NAME}}{\text{'What's her daughter's name?'}} \text{ wh}$ (18b) $\frac{\text{INDEX}_2 \text{ CHOOSE ITALY (WRONG LOC AREA)}}{\text{Why Italy (what's wrong with this area)?}} \text{ wh}$

The presence of wh-elements in (18a-b) is provable through the wh-NMM which spreads over the clause, despite no wh-sign being lexicalized. In choosing a theory to accurately account for (18a-b), the leftward movement hypothesis has a number of attractive features compared to the rightward movement hypothesis. Under the leftward movement hypothesis, the pronouns preceding the wh-elements in (18a-b) can be accounted for as being a single moved topic rather than two base-generated elements in CP; the wh-elements may be explained as simply moving leftward to occupy Spec,CP, rather than their in-situ position being pre-verbal. Lastly, the fact that BSL presents evidence of lexically-null wh-elements may allow (18a-b) to be accounted for as double constructions with a preceding topicalized element. This analysis gives leeway for data to arise that may contradict other aspects of the leftward movement hypothesis.

For these reasons, the BSL data in (18a-b) may be accounted for with the leftward movement hypothesis, as it provides a typologically sound explanation while also allowing for alternative analyses if problematic data arises in the future.

4.2 Sentences with more than one wh-phrase

BSL has access to double constructions, which may be utilized with a number of wh-signs. Consider (19a-e)⁷:

⁷ There are no examples of *WHEN* appearing in double constructions attested in the BSLCP.

- (19a) _____ wh
WHO ARRIVE LATE WHO
'Who arrived late?'
- (19b)⁸ WHAT FS:TA WHAT
'What's a TA?'
- (19c) _____ wh
WHY FOUR WHY
'Why were there four?'
- (19d) _____ wh
WHERE WHICH AREA WHERE
'Whereabouts?'
- (19e) HOW MAKE SANDWICH INDEX₃ HOW
'How did they make sandwiches?'

The analysis of double constructions by Neidle et al. (1998, 2000) and Petronio & Lillo-Martin (1997) were adequate in accounting for the phenomenon of double construction in the late 20th century, but contemporary cross-linguistic research into the subject has revealed the likely involvement of overt and covert copies in double construction in both spoken and signed languages. This, coupled with theoretical advancements in A'-movement and syntactic doubling in general, form the basis of the following analysis of double constructions in BSL.

BSL double constructions can be analyzed as wh-elements moving leftward to Spec,CP with variable copy lexicalization. Information structure is likely involved in the realization of wh-copies, as in (18a-b), context permits unlexicalized wh-elements. When lexicalized, BSL wh-elements may be either left in-situ, such as in (15a-b), or moved to Spec,CP, such as in (16a-c). Double constructions, wherein a wh-element moved to Spec,CP and a copy occupying its in-situ position are both lexicalized, are available to BSL. As is to be seen, this modified leftward movement hypothesis proves adequate in accounting for wh-movement phenomena in BSL.

4.2.1 Topics preceding double constructions

It was briefly mentioned in section 4.1 that BSL may have access to topics preceding double constructions. This section analyzes both camps' perspectives on the subject, and applies both to BSL. Neidle et al. (2000: 114-116) detail base-generated topics preceding wh-question double constructions in ASL. Consider (20):

- (20) ASL
_____ t2-bg _____ wh
VEGETABLE WHO PREFER POTATO WHO
'As for vegetables, who prefers potatoes?'

(Neidle et al. 2000: 116, ex. 18)

Under the rightward movement hypothesis, base-generated topics (such as *VEGETABLE*) precede double constructions (such as *WHO PREFER POTATO WHO*).

⁸ As standard convention in sign language literature, FS stands for *fingerspelling* or *fingerspelled*. In (20b), the letters *TA* are fingerspelled.

Though unmentioned in their analysis of topics preceding wh-question double constructions, Neidle et al. (2000: 53) do confirm that their framework allows for the possibility of “two base-generated topics” co-occurring. Consider (21):

- (21) _____ t2-bg _____ t2-bg
 CHINA INDEX_i, VEGETABLE PEOPLE PREFER FS:BROCCOLI
 ‘In China, as far as vegetables are concerned, people prefer broccoli.’
 (Neidle et al., 2000: 53, ex. 7)

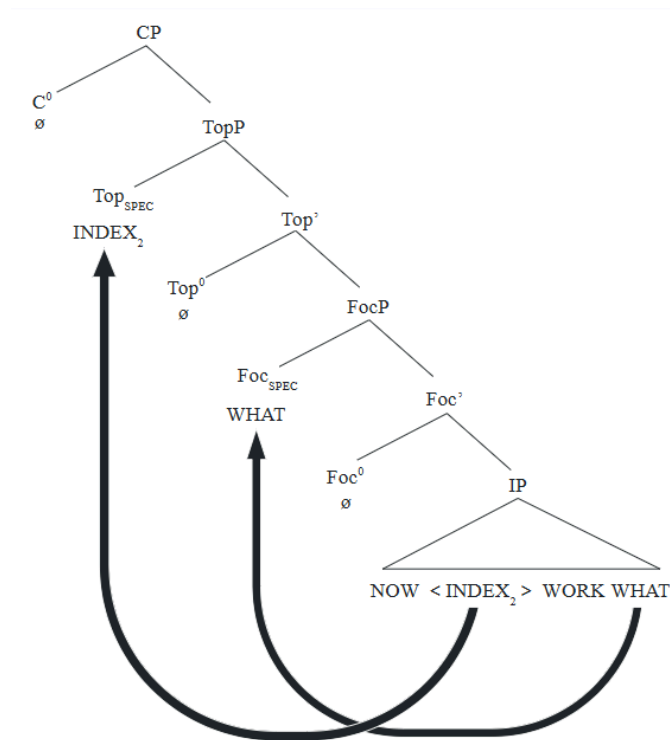
(21) presents two elements presenting with top-NMM, *CHINA INDEX_i* and *VEGETABLE*. Keeping (21) in mind, it can be assumed that both *VEGETABLES* and the initial *WHO* in (20) are both base-generated topics⁹. The inability for NMM to spread from these base-generated topics to other elements of the sentence is claimed by Neidle et al. (2000: 53-54) to support their right-peripheral Spec,CP hypothesis: “[Spec,CP] in ASL occurs to the right of TP, whereas topics occur CP-initially. Therefore, it is clear that topics do not occupy [Spec,CP] in ASL. Evidence from the distribution of nonmanual *wh*-marking shows that topics are external to the c-command domain of C [...] under this analysis, one might expect topic marking (like other nonmanual markings associated with syntactic features) to be able to spread over the c-command domain of the head of the topic projection, and therefore over the following clause, which it never does.” Similar constructions occur in BSL. Consider (22a-b):

- | | |
|---------------------------------------|----------------------------|
| (22a) BSL | (23b) |
| _____ top _____ wh | INDEX HOW EAT HOW |
| INDEX ₂ WHAT NOW WORK WHAT | ‘But how did you do food?’ |
| ‘What’s your current job?’ | |
| ‘What do you work now?’ | |

(22a-b) show topics preceding double constructions in BSL. Despite there being a scarce few examples of topics preceding wh-question double constructions in the BSLCP, each instance found seems to align with the ASL data presented by Neidle et al. (2000). However, leftward movement may still more accurately account for the BSL data in (22a-b). Due to difficulties in accurately transcribing the NMM of (22b), only (22a) will be considered for the following analysis. The structure of (22a) using the modified leftward movement hypothesis is presented in (23):

⁹ An issue in the analysis of Neidle et al. (2000: 50-54, 114-115) is the establishment of wh-topic NMM, or that ASL may combine features of wh-NMM and topic-NMM when a wh-element is in a position associated with topicalization. If the initial *WHO* sentence in (20) is a base-generated topic and wh-element, wh-topic NMM would be expected to occur, which is not indicated.

(23)



(23) shows *WHAT* generating at VP and moving left to Spec,Foc. There are no indicated intermediate points between the movement of *WHAT* from VP to Spec,Foc, though there may be undetectable, unlexicalized copies at other points in the structure. $INDEX_2$ moves from Spec,vP to Spec,Top, undergoing topicalization. BSL top-NMM does not obligatorily spread to c-commanded elements, though it is the case that wh-NMM obligatorily spreads to c-commanded elements.

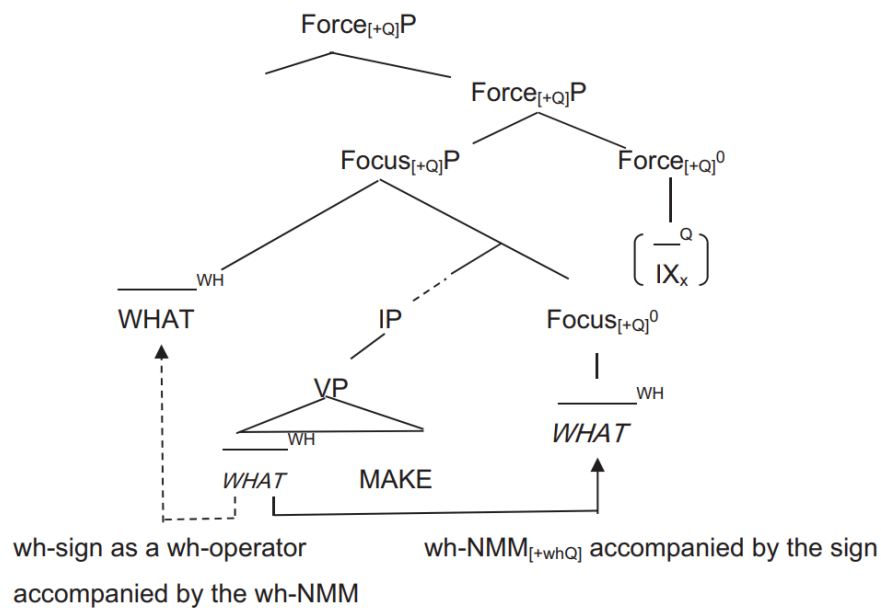
There are a number of theoretical advantages held by structure presented in (23) over the structures presented in (5). The main advantages are: that *WHAT* is analyzed as a DP consistently rather than variably as a Head or phrase, depending on its generated position; that recent literature, such as Bross (2023), also analyzes *WHAT* as a DP while accurately accounting for wh-distribution in sign languages; and that (23) incorporates Rizzi's (2000) cartography of the left periphery.

4.3 Perseveration constructions

Despite its existence being attested across sign language linguistic literature, perseveration continues to be an understudied phenomenon specific to the signed medium. Perseveration (in sign language linguistics) is defined by Neidle et al. (2000: 118) as: “the same articulatory configuration [being] used multiple times in close proximity”. The general phenomenon described by Neidle et al. (2000: 188) as it relates to wh-elements will herein be referred to as wh-sign non-dominant manual marking (whs-NDMM). The sentence presented in (24) provides examples of ASL wh-NMM and whs-NDMM perseveration from Neidle et al. (2000: 188, ex. 23):

Uchibori & Matsuoka (2016: 12) expand this hypothesis to account for JSL wh-NMM, positing that the articulatory capabilities of the signed medium triggers wh-NMM with the movement of QP: “This proposal is crucially based on the fact that a sign language utilises more than one articulator. A wh-word in JSL consists of two parts: a wh-interrogative marker and a wh-word. The former is morphologically realised as the wh-NMM, and the latter is formed by the wh-sign”. The diagram in (27) is the structure proposed by Uchibori & Matsuoka (2016: 144) to account for the data in (25):

(27) JSL wh-movement resulting in split wh-NMM



(Uchibori & Matsuoka, 2016: 144, ex. 14)

BSL does not appear to have access to the optionality demonstrated in the double constructions of ASL or JSL, as there is evidence for consistent and complete wh-NM spread across interrogative clauses¹⁰. (28a-c) demonstrates the complete causal spread of wh-NMM

¹⁰ The data from which this generalization has been formed is quite limited; only seven occurrences of double constructions were recorded in the entirety of the transcribed BSLCP, all of which demonstrated total clausal spread of wh-NMM. The BSLCP does not gloss for NMMs, so the NMM data presented in this paper is based on descriptions of BSL NMMs (Sutton-Spence & Woll, 1999: 81-98, 68-69) applied to the videos provided by the BSLCP. As indicated by Petronio & Lillo-Martin (1997: 29), NMMs are sensitive to minute changes in face shape: “[...] it became clear that subtle factors often influenced consultants’ judgments of the sentences presented. Sentences with similar word order, for instance, could be judged differently on the basis of nonmanual markers, positions and movement of the head, pausing and rhythmic patterns, the context of the utterance, and even the direct of eye gaze [...] As one example, we found that the degree to which the eyelids were opened during a brow-raise nonmanual marker could affect the interpretation and judgment of the sentence”. As no contemporary work has been done on BSL NMM, it is not in the scope of this paper to judge whether similarly slight variation may be at play in accounting for this data.

over it is indeed articulated¹¹. Contemporary research into the *wh*-movement resulting in the morphological spread in spoken language proves that BSL is not alone in this regard.

Richards' (2013) description of tense morphology spread over a clause in Lardil seems to be a result of a process similar to that in sign languages; compare the BSL *wh*-NMM spreading in (28a-c), (29) and (30) to the Lardil tense spreading in (31) from Richards (2013: 48):

- (31) Lardil (Tangkic, North Australia)
 Ngada nguthunguthu-r warnawu-thur dulnhuka-r beerr-uru-r
 1 slowly-FUT cook-FUT month.fish-FUT ti.tree-INSTR-FUT
 nyith-uru-r
 fire-INSTR-FUT
 'I will slowly cook the month fish on a fire of ti-tree wood'
 (Richards, 2013: 48, ex. 16b)

Evidently, the processes which govern future-tense spread in Lardil and *wh*-NMM spread in BSL resemble each other, at least superficially. Of course, this comparison is yet another in a growing corpus of structures occurring in spoken languages which were once thought to be unique to the signed medium; data such as that in (28a-c) and (31) support the discordant nature of linguistic medium and syntax.

4.3.2 Manual perseveration

Neidle et al. (2000: 118) report that hand dominance in manual perseveration constructions is salient in judging the grammaticality of an utterance in ASL. They add that: "[non-dominant hand manual perseveration spread] may explain some of the discrepancies in reported judgements on *wh*-questions that contain an initial *wh*-sign [...] Our informants normally accept such sentences only if there is another *wh*-phrase in the sentence, either in situ or clause-finally". (32a-b) contains data of manual-dominance discrepancies in grammaticality from ASL:

- (32a) ASL
wh-----wh
 "WHAT", JOHN LIKE [dominant hand]
 "WHAT"----- "WHAT" [nondominant hand]
 'What, what does John love?'

¹¹ Neidle et al. (1998: 820) describe similar occurrences in ASL *wh*-object in-situ. As Neidle et al. (1998) precede the adoption of copy theory, accounting for *wh*-NMM perseveration continuing past the manual content of a sentence proves difficult; data of this phenomenon from Neidle et al. (1998: 820) is presented in (i):

- (i) ASL
JOHN SEE WHO YESTERDAY wh
 'Who did John see yesterday?'
 Neidle et al. (1998: 820, ex. 1h)

- (32b) wh-----wh
 *“WHAT”, JOHN LIKE [dominant hand]
 “WHAT” [nondominant hand]
 ‘What, what does John love?’

(Neidle et al., 2000: 118, ex. 25)

(32a) shows the perseverance of *WHAT* across the clause, which ends following the final sign articulated by the dominant hand. (32b) shows that bimanual articulation without perseverance results in ungrammaticality in ASL. Neidle et al. (2000: 118-119) account for the obligatory clausal perseveration of whs-NDMM through a necessity to occupy a right-peripheral Spec,CP; as discussed previously in sections 3.3.1 and 3.3.2, optional cross-clausal wh-NMM perseveration is also claimed to be a result wh-element occupation of Spec,CP (Neidle et al., 1998: 820)¹². Under this analysis, (32b) is ungrammatical due to an unoccupied right peripheral Spec,CP.

Sáfár & Kimmelman (2015) indicate a number of potential motivators for manual perseveration; (33a-d) is a summary of points presented in Sáfár & Kimmelman (2015) by Brentari (2019: 129):

- (33) Types of H2-spread¹³
- a. phonetic: ease of articulation because two adjacent signs use the same nondominant handshape
 - b. syntactic: corresponding to a syntactic domain, such as the XP or clause
 - c. iconic: those involving classifier constructions, particularly spatial relations
 - d. discourse: H2 is used to refer to the topic of conversation over two or more clauses

For the purposes of the following discussion of manual perseveration, the fact that syntax and phonetics may motivate whs-NDMM is significant, as well as that sign languages cross-linguistically present instances of NDMM clausal spread (Sandler & Lillo-Martin, 2006: 252-253). Of the data collected from the BSLCP, no instance of a wh-sign perseverating across a clause was recorded. However, wh-signs were co-articulated with the dominant and non-dominant hands simultaneously, but not continuously articulated before or after each other; in other words, there are no recorded instances of whs-NDMM spread in the transcribed BSLCP. The data in (34a-b) provides instances of bimanual wh-sign articulation in double constructions:

¹² According to the rightward movement hypothesis, ‘clause finally’ refers to Spec,CP position (Sandler & Lillo-Martin, 2006: 438). It should be noted that the informants used in Neidle et al. (2000: 118): “normally accept such sentences if there is another wh-phrase in the sentence, either in-situ or clause-finally”.

¹³ NDMM is noted as being referred to as ‘weak hand holds’ by Brentari (2019: 126). In Sáfár & Kimmelman (2015), NDMM are referred to as *h2*.

(34a) BSL

_____top_____	_____wh
DET ROOM WHAT INDEX ₃ WHAT INDEX ₃	[dominant hand]
ROOM WHAT	[non-dominant hand]

‘What was the room?’

(34b)

_____top_____	_____wh
INDEX ₂ WHAT NOW WORK WHAT	[dominant hand]
NOW WORK WHAT	[non-dominant hand]

‘What’s your current job?’

(34a-b) each present two instances of *WHAT*: both provide an example of [-bimanual] *WHAT* and [+bimanual] *WHAT*. (34a) presents the left-most *WHAT* articulated as [+bimanual], and (34b) presents the right-most *WHAT* articulated as [+bimanual].

The objective of the following discussion is to explain this variation. In the following sections, three approaches to whs-NDMM analysis will be analyzed: whs-NDMM as a result of wh-movement; whs-NDMM as a result of Q-particle moving to Focus_[+Q]⁰, done by grafting the Q-particle movement theory of JSL wh-NMM presented in Uchibori & Matsuoka (2016) to BSL whs-NDMM data; and whs-NDMM as a result of phonotactics.

4.3.2.1 BSL whs-NDMM resulting from wh-movement

BSL whs-NDMM occurrence is inconsistent with both theories of rightward and leftward movement. As seen in (34a-b), wh-signs may be [+bimanual] in both right-peripheral and left-peripheral positions. (35a-b) demonstrates whs-NDMM also occurs in sentences with a single wh-sign:

(35a)

_____wh	
WHAT DO WITH WORK NOTHING	[dominant hand]
WHAT DO WITH WORK	[non-dominant hand]

‘What does it got to do with employment?’

(35b)

_____wh	
MOVE WHERE LIVE NOW INDEX ₂	[dominant hand]
MOVE WHERE	[non-dominant hand]

‘Where have you moved to now?’

(35a) shows whs-NDMM preceding the matrix verb, and (35b) shows whs-NDMM following the matrix verb. Although the base-generated word order of BSL is unstudied (Sutton-Spence & Woll, 1999: 50), the data in (34a-b) and (35a-b) show that wh-NDMM and its host wh-sign may or may not co-occur in the right and left peripheries of the sentence, as well as pre- and post-verbally. For these reasons, whs-NDMM as a result of wh-movement does not account for these occurrences based on this data; however, a larger data pool and L1-speaker consultation may prove this to be a viable option in the future.

4.3.2.2 BSL whs-NDMM resulting from Q-particle movement

As established above, split wh-NMM in JSL is a result of Q-particle movement to $\text{Force}_{[+Q]}^0$. This section examines the possibility of whs-NDMM as a secondary articulation of Q-particle movement to $\text{Force}_{[+Q]}^0$, naturally entailing that whs-NDMM and wh-NMM are inseparable phenomena in BSL. The potential viability of this hypothesis stems from the surface similarities shared between wh-NMM in JSL and whs-NDMM in BSL, as shown in (36a-b):

(36a=(25)) JSL

_____ TOP	_____ WH	_____ WH	_____ Q
YAMADA IX _{3(YAMADA)}	WHAT	MAKE WHAT	IX _{3(YAMADA)}

‘(As for Yamada,) what does he make?’

(36b) BSL

_____	whq
HOW MAKE SANDWICH INDEX ₃	HOW [dominant hand]
HOW	HOW [non-dominant hand]

‘How do they make sandwiches?’

(36a-b) present split marking of wh-elements using a secondary articulator. In (36a), wh-NMM is co-articulated with two instances of *WHAT* without spreading to other elements in the clause; in (36b), *HOW* is co-articulated in the non-dominant hand without spreading to other elements of the clause. However, BSL *HOW* is phonetically [+bimanual]; further examination of normally [-bimanual] signs in BSL being articulated as [+bimanual] consistently demonstrates the discordance between wh-NMM and whs-NDMM co-occurrence. Consider the following wh-NMM/whs-NDMM data in (37a-b):

(37a=(34a))

_____ top	_____	wh
DET ROOM WHAT INDEX ₃	WHAT INDEX ₃	[dominant hand]
ROOM WHAT		[non-dominant hand]

‘What was the room?’

(37b=(34b))

_____ top	_____	wh
INDEX ₂ WHAT NOW WORK	WHAT	[dominant hand]
NOW WORK WHAT		[non-dominant hand]

‘What’s your current job?’

Basing the analysis of whs-NDMM sentences on the conclusions reached in section 4.3.1 does not accurately account for this data; Q-particle movement to a right-peripheral $\text{Focus}_{[+Q]}^0$ does not consistently result in whs-NDMM articulation. Both (37a) and (37b) present a topicalized element preceding a double construction, though their distribution of whs-NDMM are not alike: (37a) has the initial wh-element of the double construction marked with whs-NDMM, and (37b) has the sentence-final wh-element marked with whs-NDMM. Using Q-particle movement to account for this data would entail that a wh-element

occupying $\text{Force}_{[+Q]}^0$ receives whs-NDMM when lexicalized, and when the wh-element occupying $\text{Force}_{[+Q]}^0$ is not lexicalized the left-most wh-element receives whs-NDMM. This analysis is problematic for a number of reasons, especially due to BSL sentences such as those presented in (38a-b):

(38a=(19d)) _____ whq
 WHERE WHICH AREA WHERE
 ‘Whereabouts?’

(38b=(19c)) _____ whq
 WHY FOUR WHY
 ‘Why were there four?’

Both (38a-b) present double constructions where the final wh-element occupying $\text{Force}_{[+Q]}^0$, provable by the complete clausal spread of wh-NMM, are not marked with whs-NDMM. With these facts considered, as well as the fact that whs-NDMM in single wh-element sentences may occur before or after the verb, it is likely the case that Q-particle movement and whs-NDMM are unrelated phenomena in BSL.

4.3.2.3 BSL whs-NDMM resulting from phonotactics

Reexamining (34a-b) and (35a-b) through the framework of phonotactics rather than syntax reveals the likely culprit of the asymmetrical distribution of wh-NDMM in BSL. The sign directly preceding the initial *WHERE* in (35a), *WORK*, is inherently [+bimanual]. Note that *WHERE* is variably produced as [+bimanual] or [-bimanual] in isolation, while *WHAT* is consistently a [-bimanual] sign. In (34a-b) both instances of *WHAT* co-occurring with whs-NDMM are preceded by [+bimanual] signs (*ROOM* and *WORK*, respectively). (35a) presents an instance of [+bimanual] *WHAT* with no preceding bimanual sign; however, *DO*, which directly follows *WHAT*, is a [+bimanual] sign. The phonological rule presented in (39) can account for the variation presented in BSL whs-NDMM presented in this chapter:

(39) $[-\text{bimanual}] \rightarrow [+bimanual] / \{ [+bimanual] ____ \}$
 $[+\text{wh}] \qquad \qquad \qquad \{ ____ [+bimanual] \}$

Applying Ockham’s Razor to the theories presented in this section produces phonotactic processes as the simplest explanation to account for the distribution of whs-NDMM in BSL. It is important that BSL whs-NDMM is further examined in the future to confirm this rule’s validity, especially pertaining to dialectal variation.

4.3.3 Summary

Section 4.3 has examined instances of manual and non-manual perseveration in BSL and examined relevant theories posited by Neidle et al. (2000) and Uchibori & Matsuoka (2016) for ASL and JSL perseveration respectively. Through this examination, two important conclusions were reached: that BSL consistently demonstrates the spread of wh-NMM over

elements c-commanded by wh-elements occupying $\text{Focus}_{[+Q]}^0$ and that BSL whs-NDMM is likely not a syntactic process, but a result of phonological constraints.

4.4 Generic WHAT

Neidle et al. (2000: 117) describe a syntactic phenomenon in ASL called the *generic wh-sign*. They explain that: “ASL is somewhat unusual in having generic *wh-sign*, glossed as ‘WHAT’ (sometimes glossed elsewhere as ‘*wh-generic*’), that can be used to ask where, who, how, what, why and so on, and that may refer back to a more specific question phrase”. Thus far, generic wh-signs (hereon referred to as WH_{gen}) have received little attention from researchers despite its seeming atypicality in the syntaxes of spoken language. Consider the ASL WH_{gen} data in (40):

(40) ASL

_____ whq
WHO, LOVE JOHN WH_{gen}
‘Who loves John?’

Neidle et al. (2000: 177, ex. 20)

WHO and WH_{gen} refer to the same entity (i.e., *someone who loves John*). Neidle et al. (2000: 187) imply that WH_{gen} may be a result of ASL’s dispreference toward identical wh-signs occurring adjacently. However, evidence from BSL and developments in syntactic theory since Neidle (2000) provides insight into the nature of WH_{gen} ; specifically, that it is likely two separate phono-syntactic phenomena rather than one. In this section, I provide evidence of WH_{gen} as a partial copy realization and semantically-empty wh-operator in BSL. Occurrences of WH_{gen} are analyzed in BSL through the lenses of left-peripheral and right-peripheral Spec,CP.

4.4.1 Generic WHAT as partial copy-realization

To begin the analysis, (41a-b) provides data of WH_{gen} co-occurring with semantic wh-signs in BSL. As in ASL, WH_{gen} is realized as WHAT:

(41a) BSL

INDEX_3 WH_{gen} HOW FEEL INDEX_3
‘How did he feel?’

(41b) INDEX_2 SAME WH_{gen} WHO

‘Like who?’
“Who are you the same as?”

In (41a), WH_{gen} precedes *HOW*, and both wh-elements precede the matrix verb *FEEL*. The subject (INDEX_3) is doubled¹⁴. In (41b), WH_{gen} again precedes the main wh-element, *WHO*. Both WH_{gen} and *WHO* follow the adjective *SAME* and subject, INDEX_2 . It may be assumed based on the data in (41a-b) that WH_{gen} necessarily precedes the main wh-element in BSL. BSL WH_{gen} operates differently than that of ASL, as ASL disallows generic WHAT to proceed main wh-elements, shown in (42):

¹⁴ It is relevant to note that Petronio & Lillo-Martin (1997: 28) list wh-elements, quantifiers, modals and verbs as having access to double construction in ASL. The data in (41a) shows that BSL has an extra lexical category available in double constructions: pronouns.

(42) ASL

_____ whq
 *WH_{gen}, LOVE JOHN WHO
 Intended: ‘Who loves John?’

Neidle et al. (2000: 116, ex. 22)

The discrepancy between the BSL data in (42a-b) and the ASL data in (40) and (41) can be understood as differences in post-syntactic lexicalization. From the left-peripheral Spec,CP perspective, (41b) involves the movement of the lower wh-element (*WHO*) moving to vP to license further movement to Spec,CP. The copy left in vP is lexicalized as *WHAT* (WH_{gen}), and the lower copy is lexicalized as *WHO*. The wh-element in Spec,CP is optionally null. (41a) involves the movement of *INDEX₃* preceding that of the wh-element (*HOW*). It could be that the syntactic processes which result in double constructions, when co-occurring with a non-doubling wh-element and WH_{gen} restrict their movement and affect their lexicalization post-syntactically, resulting in sentences such as (41a).

The rightward movement perspective has difficulty explaining the data in (41a), as the generated position of wh-elements is post-verbal according to Petronio & Lillo-Martin (1997: 27). It may be the case that there are multiple base-generated topic (*INDEX₃*) and focus (WH_{gen}, *HOW*) heads, which could account for (41a) through rightward movement. (41b) can be analyzed as the wh-element (*WHO*) moving rightward to Spec,CP, a copy of which is partially lexicalized as WH_{gen} at an intermediate specifier between the postverbal and Spec,CP positions.

BSL provides evidence of WH_{gen} and double constructions being independent phenomena. Consider (43):

(43) BSL

WHAT INDEX₃ EXPLAIN WHAT INDEX₃ WHAT
 ‘What’s the story behind *Dirty Dancing*?’
 “What is it (explain what it is)?”

WH_{gen} and double construction’s co-occurrence may be analyzed similar to (or a combination of) Barbier et al.’s (2008) analysis of Swiss German double constructions and Neagu’s (2022) analysis of the same phenomenon in Northern Italian languages. Swiss German and Northern Italian double constructions differ in lexicalization processes: In the analysis of Neagu (2022: 249), it is noted that copies may be partial (not phonologically identical to their source element); in this analysis, partial copies contrast full copies (meaning phonologically identical to their source element). An example of a full wh-element copy from Swiss German is in (44a) and partial wh-element copy from Monnese Lombard in (44b):

(44a) Swiss German (West Germanic, Indo-European)

Wer isch da gsi wer?
 who is there been who
 ‘Who was there?’

Barbiers et al. (2008: 13, ex. 22)

(44b) Monnese Lombard (Gallo-Romance, Indo-European)

Ke fe-t fa kwè te?
 what do.PRS=CL.2SG do what you
 ‘What is your occupation?’ (lit. ‘What do you do?’)

Neagu (2022: 350)

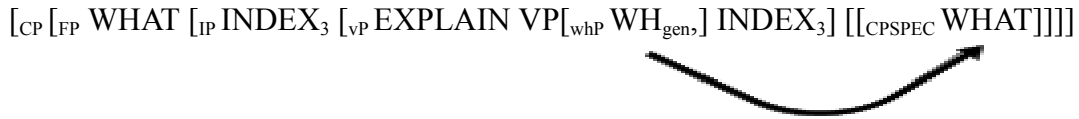
In (44a), *wer* is doubled. Through the leftward movement framework, the lower *wer* is a full copy. In (44b), *ke/kwè* is also doubled. Neagu (2022: 349-350) analyzes *kwè* as a partial copy of *ke*. The BSL sentence in (43) can be analyzed as a co-occurrence of these two processes, with the circumstantial wh-elements as a product of doubling, and the intersentential wh-element as a partial copy. In this context, generic WHAT can be understood as a partial copy of a wh-element.

The following discussion will examine the structure of (43) through left-peripheral Spec,CP and right-peripheral Spec,CP perspectives; (45) presents the left-peripheral Spec,CP model of (43):

(45) *Leftward analysis of (43)*

[_{CP} WHAT C⁰ [_{IP} INDEX₃ [I⁰+V⁰ EXPLAIN] [_{vP} WH_{gen} [_{vP} INDEX₃ v⁰ [_{VP} V⁰ [_{DP} WHAT]]]]]]]

In (45), *WHAT* is generated at whP in the right-periphery. *WHAT* moves out of VP to a position following *EXPLAIN* in vP. *WHAT* then moves to Spec,CP. Post-syntactically, *WHAT* occupying Spec,CP and its base-generated position are lexicalized as full-copies and the intermediate *WHAT* following *EXPLAIN*, a partial copy (WH_{gen}). As A'-movement is successive-cyclical, the landing spot for the initial movement to vP can be explained as *WHAT* moving to the left-most position of vP (which is a phase and represents a cycle) to permit further movement to Spec,CP. This model of wh-movement in BSL functions within antisymmetry theory and the leftward movement hypothesis. However, rightward movement may still be a viable option of analyzing WH_{gen} in double constructions. (46) provides the structure of (43) through the rightward movement framework:

(46) *Rightward analysis of (43)*

In (46), *WHAT* is generated in a whP following the matrix verb and moves right to Spec,CP. The left-most *WHAT* is base-generated in FocusP. Post-syntactically, the intersentential copy is lexicalized as a partial copy (WH_{gen}), and the base-generated focused wh-element and Spec,CP *WHAT* are lexicalized as a full copy.

In both the leftward and rightward analyses, the intersentential *WHAT* in (43) has been referred to as a lexicalized partial copy (WH_{gen}). (47) provides evidence of intersentential wh-elements being lexicalized as WH_{gen} , independent of the wh-element's semantics:

- (47) WHY TWO WEEK-TWO INDEX_2 OWN TWO WEEK-TWO TOGETHER WITH WH_{gen} WHY
 'Why did you spend two weeks on your own and 2 weeks with your partner?'

WHY occurs circumsententially, and WH_{gen} intersententially. Through the right-peripheral Spec,CP analysis of WH_{gen} , the wh-element is generated intersententially and lexicalized as a partial copy (WH_{gen}). The moved rightward and base-generated focused wh-elements are lexicalized as full copies (*WHY*). Through the left-peripheral Spec,CP analysis, the wh-element is generated in VP and lexicalized as a full copy (*WHY*), and moves to a left-peripheral position within vP, which is lexicalized as a partial copy (WH_{gen}). Finally, the wh-element moves to Spec,CP and is lexicalized as a full copy (*WHY*). Independent of Spec,CP direction-analysis, it is safe to assume based on this evidence that BSL partial copies take the form *WHAT*.

4.4.1 Generic *WHAT* in Yes-No questions

Traditional analyses of WH_{gen} have not limited its occurrence to wh-questions, but also yes-no questions. Kyle & Woll (1985: 160) provide a brief description of BSL yes-no question articulation which includes mention of WH_{gen} : "[...] index finger raised, palm away from body, held still or wiggled side to side (as in BSL *WHAT*)". Three occurrences of yes-no questions containing WH_{gen} were found in the BSLCP, which are shown in (48a-c)¹⁵:

¹⁵ Neidel et al. (2000: 122-123) report ASL having access to an identical sign to mark yes-no questions, glossed as QMwg (presumably 'question-marking wiggle'), wherein the index finger is wiggled back and forth. This is surprising, as QMwg has the same form as *WHAT* in BSL, but is not a referential wh-element in ASL. Two explanations may account for QMwg in ASL: the first, is that QMwg arose independently in both BSL and ASL as a yes-no question-marker; or that Martha's Vineyard SL (MVSL), which is reported to have creolized with Old French SL (OFSL) to form ASL (Kegl, 2008), was a relative of BSL. For this reason, BSL *WHAT* was retained as a yes-no question marker (QMwg) in ASL, despite the regular sign for ASL *WHAT* being inherited from OFSL.

- (48a) CONTINUE RELATIONSHIP CONTINUE INDEX₂ WH_{gen}
 ‘Do you still stay in touch with him?’
 ‘Did you continue to have a relationship?’
- (48b) MEAN DIRTY VAPOUR STINK SMELLY WH_{gen} (KNOW-NOT INDEX₁)
 ‘Does it involve being smelly with dirty clothes (I don’t know)’
- (48c) BLOOD WH_{gen} INDEX_{3POSS}
 ‘There may be blood involved?’
 ‘Blood, is it involved?’

Instances of WH_{gen} such as those in (48a-c) are analyzed here as semantically null wh-operators optionally used to mark yes-no questions. Similarly semantically-null wh-operators have evidence to exist in spoken language; for example, null wh-operators have been used to account for subject-auxiliary inversions (SAI) questions in English (Alboiu, 2024). While this element is always null in Modern English (ME), Early Modern English (EME) had a lexicalized semantically-null wh-operator, *whether*. Compare the EME data from Shakespeare (1623/1993: 191) data in (49) to the data in (48a-c):

- (49) Early Modern English (West Germanic, Indo-European)
 Whether dost thou profess thyself a knave or a fool?
 ME: Do you profess yourself a knave or a fool?
 (Shakespeare, 1623/1993: 4.5.191)

In (48a-b), WH_{gen} is the final element in the sentences; in (48c), it is the second element in the sentence. There are no instances of an initial WH_{gen} in BSL yes-no questions. From the left-peripheral Spec,CP perspective, WH_{gen} generates low in the structure and remains in-situ. To account for (48c), WH_{gen} must generate higher than the subject, the subjects of (48a-b) are moved leftward. From the right-peripheral Spec,CP perspective, WH_{gen} generates post-verbally and moves to Spec,CP in (48a-b). To account for (48c), WH_{gen} remains in-situ.

4.4.1 Summary

In this section, BSL WH_{gen} is analyzed as two phenomena rather than one: WH_{gen} may be a partial copy of a wh-element or as a semantically-null wh-operator. For this reason, it is appropriate to split the traditional analysis of WH_{gen} between partial copy occurrences and semantically-null wh-operator occurrences, in effect making the concept of WH_{gen} (as a unified, single phenomenon) obsolete. While this section has applied left and right-peripheral Spec,CP analyses to BSL syntax, it would seem that left-peripheral Spec,CP best accounts for this data, as the structure proposed by the right-peripheral camp has difficulty accounting instances of WH_{gen} co-occurring with one other wh-element.

5 Future work

This chapter details potential areas of research stemming from the discussion of BSL presented in this project and other inquiries in sign language syntax. This includes further analysis of BSL sluicing constructions and NMMs.

5.1 Sluicing theory of double constructions in BSL

As discussed in section 3.2.3, it was not within the scope of this project to analyze BSL wh-movement as sluicing. However, recent postulations by Bross (2023) are promising for an alternative account of sign language double constructions. In their squib, Bross (2023) presents data from German Sign Language (DGS) wh-question double constructions which benefit from being analyzed as instances of sluicing rather than syntactic doubling or lexicalized copies. The basic hypothesis of Bross (2023) is thus: “[...] [double constructions] of wh-elements are not copies, but that the clause-initial element is a wh-phrase, while the clause-final element is a wh-relative pronoun” Bross (2023: 261). To support this hypothesis, Bross (2023: 263-267) appeals to sluicing constructions in spoken languages which bear resemblance to doubling in sign languages. Consider the Central Swabian data in (50):

- (50) Central Swabian (West Germanic, Indo-European)
 Was glaubsch du, was die Joy kauft?
 what believe you what the Joy buys
 ‘What do you believe it is that Joy buys?’ (Bross, 2023: 263, ex. 7)

Was glaubsch du is a matrix clause, and *was die Joy kauft*, an embedded clause. Central Swabian allows for “wh...wh constructions”, wherein “[...] the wh-phrase in the matrix and the wh-relative pronoun in the embedded clause are the same” (Bross, 2023: 263). While this data is often accounted for with cyclical movement of the wh-phrase, Bross (2023: 265) presents arguments for these wh-elements being generated separately. His first argument is that “an analysis based on cyclic movement would not predict that copying of a complex wh-phrase is ruled out”, which it is in Central Swabian and DGS as shown in (51a-b):

- (51a) Central Swabian
 *Welchas Audo war des, welchas Audo du kauft hosch?
 which car was that which car you bought have
 Intended: ‘Which car did you buy?’ (Bross, 2023: 264, ex. 8c)

- (51b) DGS
 _____ wh
 *WHICH COMPUTER PAUL BUY WHICH COMPUTER
 Intended: ‘Which computer did Paul buy?’ (Bross, 2023: 261, ex. 4c)

Note that Central Swabian allows identical wh-phrases contained in a PP as the wh-phrases in the matrix and embedded clauses. DGS also allows wh-phrases contained in a PP in double constructions, as shown in (52a-b):

(52a) Central Swabian

Mit wem war des, mit wem du kocht hosch?
 with who was that with who you cooked have
 ‘With whom did you cook?’

(Bross, 2023: 264, ex. 8b)

(52b) DGS

_____ wh
 WITH WHO INDEX₂ CARD PLAY WITH WHO
 ‘With whom did you play cards?’

(Bross, 2023: 261, ex. 4b)

Bross’s (2023: 265) second argument against cyclical movement in Central Swabian is that “[...] the matrix wh-element and the embedded wh-element in the clefted construction can diverge [...] Thus, there is evidence that the two wh-elements are generated independently of one another”. Evidence of dissimilar matrix and embedded wh-elements in Central Swabian is presented in (53):

(53) Central Swabian

Wer war das, wen du troffa hosch?
 who.NOM was that who.ACC you meet have
 ‘Who was it you met?’

(Bross, 2023: 265, ex. 10)

For these reasons, Bross (2023: 267) analyzes the DGS data in (52a) as a “a sluiced wh-relative clause embedded under a wh-question”, undergoing similar processes as the English sentence presented in (54b):

(54a) DGS

_____ wh
 WHAT INDEX₂ BUY WHAT
 ‘What did you buy?’

(Bross, 2023: 267, ex. 13)

(54b) English (West Germanic, Indo-European)

Joy bought something and I want to know what ~~it was Joy bought~~.

(Bross, 2023: 269, ex. 15b)

There are some reasons why sluicing may account for double constructions in BSL. Most obvious is that DGS and ASL, like BSL, are sign languages possessing double constructions. This fact alone is enough to motivate further investigation into the matter; but BSL also exhibits constructions mirroring those of DGS, specifically those presented as possible evidence of sluicing. Consider (55a-b):

(55a) DGS

WHAT INDEX₂ BOUGHT WHAT INDEX₂ BOUGHT

‘What did you buy?’

(Bross, 2023: 271, ex. 17a)

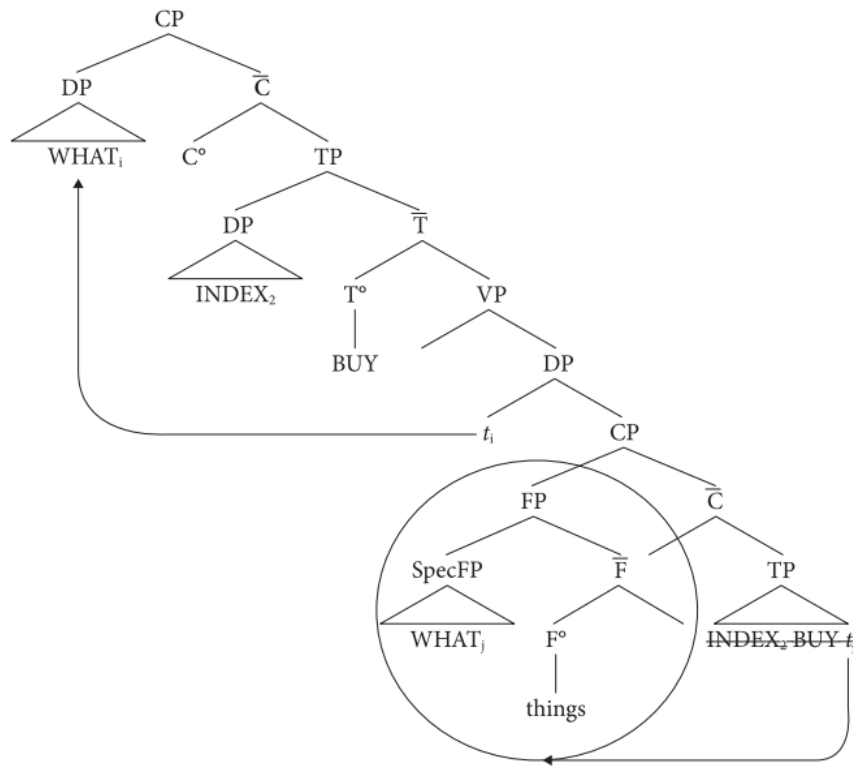
(55b) BSL

WHY-NOT GO INDEX₂ WHY-NOT GO INDEX₂

‘Why don’t you come?’

(55a-b) both have a wh-element, verb and pronoun which occur twice each. The tree structure in (56) is proposed by Bross (2023: 268) to account for (55a):

(56)



(Bross, 2023: 268, ex. 14)

Applying the structure in (56) to the BSL data from (55b), *WHY-NOT GO INDEX₂* would be generated in the embedded clause and sluiced, with *WHAT* moving to Spec,CP in the matrix clause. The resulting sentence is *WHY-NOT GO INDEX₂ WHY-NOT*, which bears close resemblance to other double constructions in BSL, such as that in (57):

frown”. This NMM seems to share traits of BSL topic-NMM and wh-NMM. It therefore may be the case that the face shape variation described in Deuchar (1984) may be a result of similar processes as those described in Neidle et al. (2000), a combination of topic and wh-NMM. Further in depth examination of BSL NMM will be necessary to determine the validity of this hypothesis.

6 Conclusions

Though there is yet to be a consensus reached on the nature of movement in sign languages, great progress in the rightward/leftward debate has certainly been made since the late 20th century. The development of cyclical movement, copy theory, and the medium-inclusive typological comparison has directed the syntactic conventions of sign language study to resemble those developed through the analysis of spoken language. In other words, theoretical developments have given contemporary sign language researchers a panoptic view on the perceived atypical syntactic phenomena claimed to be medium-based in the past. Many of the exceptionalities thought to be unique to the signed medium have been analyzed as occurring (or having equivalents) in spoken languages. For instance, NMMs have been analyzed as equivalent to prosody in spoken language and double constructions found to occur independent of medium.

BSL, though relatively well-studied by sign language standards, holds a unique position in the field which has yet to be capitalized on by researchers: it has a great amount of institutional support, with the majority of its speakers having access to services or technology which facilitate the recording of the language, and there are BSL corpora available which contain a huge amount of varied data from a range of genres. This paper has only begun to scratch the surface of the complexities of BSL wh-movement and how it fits into the larger puzzle of sign language syntactic typology. Due to practical constraints, many of the conclusions reached throughout are preliminary, and some even tentative. I encourage BSL researchers to analyze the constructions presented here and draw their own conclusions as to the syntactic structures of the data.

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