Content interrogatives in a young sign language

Seyyed Hatam Tamimi Sa'd, Roland Pfau, & Ronnie B. Wilbur*

Abstract. We examined content interrogatives, i.e., *wh*-questions, in a young family sign language, Sadat Tawaher Sign Language (STSL), which began to emerge sixty years ago in a single household in southwestern Iran following a man's sudden, complete hearing loss. We show that the *wh*-sign in STSL remains in situ and that it is sometimes doubled. Furthermore, we offer a formal account of content interrogative formation and *wh*-doubling in STSL. Our analysis adds to the repertoire of young/emerging sign languages for which *wh*-questions have been investigated to date (e.g., Nicaraguan Sign Language).

Keywords. Content interrogative, emerging sign language, *wh*-doubling, *wh*-movement

1. Content interrogatives across modalities. Interrogation (i.e., question formation) is one of the universal features of language. Both polar (yes/no) and content (*wh*-) questions are found in all the languages investigated thus far. In content questions, i.e., questions that contain an interrogative phrase, the *wh*-phrases are found in various positions in the sentence across the world's languages. In the World Atlas of Linguistic Structures (WALS) survey of 902 languages (Dryer 2013), the interrogative phrase obligatorily moves to the sentence-initial position in 264 languages, while it does not obligatorily occur in such a position in 615 languages. On the other hand, 23 languages exhibit mixed behavior, with some *wh*-phrases obligatorily moving to sentence-initial position and others not. Thus, spoken languages can roughly be divided into two types in terms of content interrogatives: *wh*-movement languages and *wh*-in-situ languages. The former are known as the English-type languages and the latter as the Chinese-type languages (Huang 1982).

1.1. THE POSITION OF *WH*-WORDS. In *wh*-movement languages such as English, *wh*-phrases obligatorily move leftward overtly in syntax, leaving behind a trace (*t*) in their original position, as illustrated in (1). Traditionally, the C head is assumed to bear an uninterpretable [+wh] feature that probes the interpretable [+wh] feature associated with the *wh*-phrase. This Agree relation has to be established in syntax, thus triggering the movement of the *wh*-phrase to Spec-CP for feature-checking purposes, yielding a clause-initial interrogative operator and making the operator-bound variable interpretation possible (Miyagawa 2010).

(1) Overt leftward wh-movement: What$_i$ did John eat t$_i$

In more recent accounts of *wh*-questions, the left periphery of the clause is assumed to involve an interrogative phrase InterP, whose head may host a question particle, and *wh*-movement targets the specifier of a focus phrase below InterP (Rizzi 1997; Aboh 2004). For ease of exposition, and in order to be in line with previous accounts of interrogatives in sign languages (see Section 1.2), we stick to the Spec-CP convention.

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Things are different in *wh*-in-situ languages such as Chinese, where *wh*-phrases remain in their underlying position. The *wh*-in-situ slot is the position that is natural for the corresponding non-interrogative sentences, i.e., declarative sentences; see (2) for Chinese, a Subject-Verb-Object language. For *wh*-in-situ languages, it is commonly assumed that the *wh*-phrase moves leftward to a clause-initial question operator position covertly, i.e., at Logical Form (LF), to take scope over a bound variable *e* in the original position of the *wh*-phrase, as in (3). That is, in *wh*-in-situ languages, the feature checking requirement is met without overt *wh*-movement (Huang 1982).

(2) *Wh*-in-situ in Chinese
ni xihuan shei?
you like who
'Who do you like?' (Ex. (1) in Huang 1982: 370)

(3) Covert leftward *wh*-movement in Chinese
[shei$_i$ [ni xihuan e$_i$]]
who you like (Ex. (2) in Huang 1982: 370)

Less commonly, however, the *wh*-phrase may move rightward. Yet, the accepted assumption in the literature is that true *wh*-movement is leftward (Cinque 2023). Rightward *wh*-movement is thus believed to be the result of other syntactic, discourse, or focus operations such as right dislocation or *wh*-sluicing (4).

(4) Someone here owns a Mercedes but I don't know who.

The next section examines content interrogatives in sign languages.

1.2. CONTENT INTERROGATIVES IN SIGN LANGUAGES. Not surprisingly, content interrogatives are among some of the most extensively studied constructions in sign languages and have been investigated in a considerable number of sign languages, including American Sign Language, Austrian Sign Language, Croatian Sign Language, Dutch Sign Language, Indian Sign Language, Italian Sign Language, Turkish Sign Language, and Nicaraguan Sign Language, among many others (for overviews, see Zeshan 2004, 2006; Kelepir 2021). Zeshan (2004), for instance, presents a broad cross-linguistic overview of polar and content interrogatives in 37, mostly European, sign languages, based on findings from surveys, fieldwork, and published material. These studies have investigated content interrogatives from various perspectives, including (i) whether manual markers, non-manual markers (NMMs), or both are employed in such constructions, (ii) the types and the spreading domain of NMMs, (iii) the number of question words available in a given language (i.e., a specific sign for each *wh*-phrase vs. one general *wh*-sign), and (iv) the position and movement of the *wh*-sign(s) in the clause. Other studies have attempted to explain content interrogatives using a formal model.

Together, these studies have shown that sign languages employ manual and non-manual resources in the formation of content interrogatives (Zeshan 2004, 2006; Kelepir 2021). Moreover, they demonstrate that, across sign languages, manual interrogative signs appear in various positions in the clause. In (5) to (8), we illustrate different options with examples from Turkish Sign Language (TİD), a head-final Subject-Object-Verb language. In TİD, *wh*-signs may remain in situ (5), overtly move either leftward to a clause-initial position (6) or rightward to clause-final position (7), or be copied in a so-called *wh*- doubling construction, where one *wh*-sign typically

occupies the clause-final position while the other one appears in clause-initial position or remains in situ (8).[1]

(5) *Wh*-in-situ in TİD
wh
INDEX$_2$ WHAT READ
'What did you read?'

(6) Leftward *wh*-movement in TİD
wh
WHAT$_i$ INDEX$_2$ t_i READ

(7) Rightward *wh*-movement in TİD
wh
INDEX$_2$ t_i READ WHAT$_i$

(8) *Wh*-doubling in TİD
wh
INDEX$_2$ WHAT$_i$ READ WHAT$_i$ (Ex. (1a–d) in İşsever & Makaroğlu 2013: 169)

In terms of the *wh*-paradigm, some sign languages such as American Sign Language (ASL) and Italian Sign Language (LIS) have multiple specific *wh*-signs for various *wh*-meanings such as 'who', 'what', 'when', etc., while others like Indian Sign Language (ISL) have only one general *wh*-sign whose meaning has to be inferred from the context.

NMMs typically used with content interrogatives include lowered eyebrows, head back or forward, chin up, and headshake (e.g., Wilbur 2000; Zeshan 2004; Kocab, Senghas & Pyers 2022). Interrogative NMMs may accompany the *wh*-sign only, as in the example from Hong Kong Sign Language (HKSL) in (9), or spread over the entire clause as in (5)–(8) above and (10) below.

(9) ELDER-BROTHER BUY cont-q
WHAT1
'What did the elder brother buy?' (Ex. (19) in Tang 2006: 212)

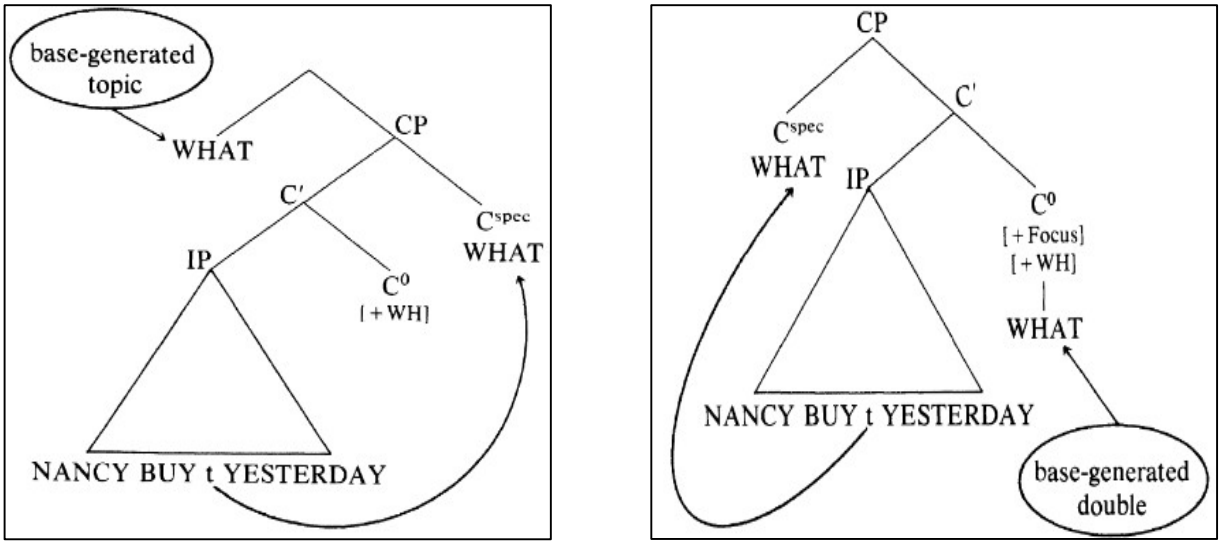
Finally, the landing site of *wh*-movement, i.e., whether the interrogative sign is located on the right or on the left, has generated considerable controversy in research on content interrogatives (Kelepir 2021). This controversy is due to the fact that sign languages prefer the right periphery as the landing site of *wh*-movement (İşsever & Makaroğlu 2013), a position that is only very rarely targeted by *wh*-movement in spoken languages (Dryer 2013). Consequently, some analyses of *wh*-question formation in sign languages have argued for rightward *wh*-movement (e.g., Neidle, Kegl, Bahan, Aarons & MacLaughlin 1997 for ASL; Cecchetto, Geraci & Zucchi 2009 for LIS). As applied to ASL, the rightward *wh*-movement analysis argues that *wh*-phrases move to a Spec-CP position located on the right and that the initial *wh*-phrase, when present, is a base-generated topic; this is illustrated for example (10) in Figure 1a. According to this analysis, the *wh*-sign checks its [+wh] feature via Spec-head agreement with the [+wh] feature in C^0.

[1] Notation conventions: Sign language examples are glossed in SMALL CAPS, where one word represents one sign. The sign glossed as INDEX is a pointing sign that functions as pronoun. The line above the gloss line indicates the presence of an NMM, with the length of the line indicating the scope of the NMM. As for examples taken from the literature, we maintain the convention for the glossing of non-manual *wh*-markers used in the source (i.e., 'wh', 'cont-q' for 'content question', 'whq').

whq

(10) WHAT NANCY BUY YESTERDAY WHAT

'What did Nancy buy?' (Ex. (19) in Petronio & Lillo-Martin 1997: 27)



(a) (b)

Figure 1. Analyses for *wh*-movement to Spec-CP in ASL: (a) rightward movement plus base-generated topic; (b) leftward movement plus final base-generated double (Figures 20a and 20b in Petronio & Lillo-Martin 1997: 27)

The rightward wh-movement analysis, however, faces serious challenges as, for instance, it fails to account for the ungrammaticality of (11): if the target position of rightward movement was Spec-CP, then complex *wh*-phrases should be able to occupy this position – contrary to fact. In contrast, example (12), in which the complex *wh*-phrase occupies only the initial position, is grammatical.

whq

(11) *WHICH COMPUTER JOHN BUY WHICH COMPUTER

'Which computer did John buy?'

(12) WHICH COMPUTER JOHN BUY WHICH (Petronio & Lillo-Martin 1997: 33)

In contrast, other analyses (e.g., Wilbur 1995 & Petronio & Lillo-Martin 1997 for ASL; Brunelli 2011 for LIS) have argued that *wh*-movement to the right periphery is only apparent, and that sign languages can, and should, be analyzed on par with spoken languages. To account for the observations in (11) and (12), Petronio and Lillo-Martin (1997) suggest that Spec-CP is located on the left and that the interrogative sign moves there to check its [+wh] and [+Focus] features via Spec-head agreement with [+wh] feature in C^0. For cases in which a *wh*-sign only appears clause-finally, Petronio and Lillo-Martin assume that an empty *wh*-element is moved to Spec-CP. The final *wh*-phrase occupies C^0, which is endowed with a focus feature and may also serve as a focus position for other commonly doubled items in ASL, such as modals, quantifiers, and verbs. The ungrammaticality of (11) then follows from the fact that C^0 is a head position, which cannot host a phrase like WHICH COMPUTER. The grammaticality of (12) also follows from this analysis since WHICH is a head, not a phrase, and can thus occupy C^0 on the right (Figure 1b). The left-

ward movement hypothesis is currently the widely accepted view, but comes in different shades. For instance, Brunelli (2011) assumes for LIS that the *wh*-sign moves to Spec-FocP on the left (in line with Rizzi 1997), followed by remnant movement of IP to a higher specifier.[2]

1.3. OBJECTIVES. The current study is a first attempt to investigate content interrogatives in an emerging family sign language from Iran, Sadat Tawaher Sign Language (see next section). On the one hand, based on the data we collected, we will provide some descriptive findings regarding the formation of *wh*-questions, taking into account the position of *wh*-signs and the use of non-manual markers. On the other hand, we put forward a formal account for the attested patterns, which takes as point of departure previous accounts arguing for rightward vs. leftward movement in sign languages. We address the following research questions in this study:

(i) What is the structure of STSL content interrogatives?
(ii) How can the observed patterns be accounted for in a formal model?

2. Sadat Tawaher Sign Language. Sadat Tawaher Sign Language (STSL) emerged around sixty years ago in a small village called *Sadat Tawaher* in southwestern Iran following an approximately 20-year-old man's sudden deafness. Sadat Tawaher has a population of around 400 people with most inhabitants engaging in farming, hunting, and fishing. The deaf man's name is Hanash and, at the time of his deafness, he lived with his parents. Shortly afterwards, he got married. As this man had acquired Khuzestani Arabic as his native language, but had no reading or writing literacy, and as his family had no access to deaf education, the only means to communicate to him was through gesture. Over time, this gestural system developed into a linguistic system characterized by all the major features of a full-fledged sign language, such as dedicated strategies for question formation and negation, but independent of the surrounding spoken language.

STSL has around 50 signers in total, including family, friends, and neighbors. STSL has a basic SVO constituent order (13). SOV order is allowed in certain contexts but is far less common. OSV is permissible when the object is topicalized. Manual signs signaling negation are commonly clause-final.

(13) SVO order in STSL

PEOPLE HARVEST RICE
'People harvested the rice.'

[2] For Indian Sign Language, where the general *wh*-sign always appears clause-finally and can never be doubled, it has been argued that the *wh*-sign is actually a particle occupying the head of an interrogative phrase, and that everything below InterP moves to Spec-InterP, stranding the *wh*-sign in clause-final position (Aboh, Pfau & Zeshan 2005; Aboh & Pfau 2010).

3. Method. In order to study content interrogatives in STSL, we collected data from nine native signers. In the following, we provide some information about the participants, and we sketch the data collection and analysis procedures.

3.1. PARTICIPANTS. Nine hearing native STSL signers (4 female and 5 male) aged 7–55 years provided data for this study. All participants but one had acquired STSL since childhood. The participants included Hanash's children (5) and grandchildren (4). All of them have lived in Sadat Tawaher their whole lives and had frequent interactions with Hanash prior to his passing away.

3.2. DATA COLLECTION & ANALYSIS. The dataset for this study consists of 358 content interrogatives. We used three tasks to elicit the data. The first task was a sentence elicitation task, for which we constructed 35 *wh*-questions in Khuzestani Arabic, including both argument and adjunct *wh*-words. The sentences were presented to the participants who were asked to sign them in STSL. This task yielded 315 *wh*-questions in total, 17 of which were discarded for various reasons, such as incompleteness or using the wrong sentence type (e.g., declarative instead of interrogative); this left us with 298 interrogatives for the final analysis. The second task was free narratives, for which participants were asked to tell about everyday activities from their current lives or from the past. The participants were also encouraged to tell folk stories which are commonly narrated among the inhabitants of Sadat Tawaher. The total collected stories are 74 minutes long, containing 60 *wh*-questions in total. It is worth noting that only *wh*-questions that consisted of a whole sentence were considered for the analysis; fragmented questions (e.g., 'WHAT TIME') or those consisting of a *wh*-sign only were excluded from analysis. The third task was a grammaticality judgment task conducted with two signers, one male and one female, both of whom are Hanash's children. The grammaticality judgments targeted the following types of variations on the *wh*-questions:

(i) *Wh*-questions with no manual marker but with a NMM only (brow furrow)
(ii) *Wh*-questions with a manual marker but with no NMMs
(iii) *Wh*-questions with brow furrow (i) co-occurring with the *wh*-sign or (ii) spreading across the entire clause

We conducted three analyses on the data. First, we investigated the *wh*-paradigm, that is, the number of specific *wh*-signs (e.g., 'what', 'who', 'when', etc.) used in STSL. The second analysis determined the position of these *wh*-signs in the clause (e.g., clause-initial, clause-final, preverbal, etc.). Third, we examined the NMMs used in these content interrogatives, that is, the types of NMMs used, the frequency of occurrence, and their spreading over signs in the clause.

4. Results & Discussion. We present the results here in the order of the dimensions mentioned above: *wh*-paradigm, position of *wh*-signs, and attested NMMs.

4.1. *WH*-PARADIGM. Our findings indicated that STSL has only one general content interrogative sign, which we label INTERROG (Figure 2). Formationally, this sign resembles the 'palm-up' gesture, which is commonly used – in both spoken and signed languages – to express absence of knowledge (Cooperrider, Abner & Goldin-Meadow 2018); in STSL, it may be articulated with one or two-hands performing a slight repeated side-to-side movement. The meaning of INTERROG is inferred from the context. Furthermore, INTERROG occasionally combines with another sign to create what looks like 'compounds' (cf. Aboh, Pfau & Zeshan 2005 for Indian Sign Language), e.g., FACE + INTERROG = 'who' or WRIST + INTERROG = 'what time'.

Figure 2. The general STSL question sign INTERROG

As will be discussed in more detail later, INTERROG is obligatorily present, i.e., it may not be dropped, and it may optionally be accompanied by (combinations of) NMMs such as brow furrow, brow raise, chin up, headshake, and head nod.

4.2. POSITION OF INTERROG. The results further showed that INTERROG consistently remains in situ. The *wh*-in-situ pattern was observed in both *wh*-subject questions (14) and *wh*-object questions (15), and it holds true across both younger and older signers. Since STSL has SVO order, INTERROG appears clause-initially in subject *wh*-questions (i.e., INTERROG-VO) and clause-finally in object *wh*-questions (i.e., SV-INTERROG).

(14) *Wh*-subject in-situ

INTERROG HARVEST TODAY

'Who harvested today?'

(15) *W*h-object in-situ

PEOPLE HARVEST INTERROG

'What did the people harvest?'

Given basic SVO word order, when INTERROG appears in clause-final position in object *wh*-questions, it is not clear whether it in fact remains in situ or has moved to clause-final position. To resolve this issue, we tested structures involving (i) a clause-final adverb (i.e., SVO-Adv) and (ii) a clause-final preposition phrase (PP) (i.e., SVO-PP). In these tests, we presented nine sentences in Khuzestani Arabic, the signers' mother tongue, with either an adverb (16) or a PP (17/18) in clause-final position. Three participants, two females (aged 21 and 43) and one male (aged 12) signed these sentences.

(16) əl-mæræh əttəsˁłæt bi-mæn æməs
the-woman call.3S.F.PERF to-whom yesterday
'Whom did the woman call yesterday?'

(17) əl-færæx yæmtæh rɑħ l-əl-mædrəsæh
the-boy when go.3S.M.PERF to-the-school
'When did the boy go to school?'

(18) əl-əfrux liyæʃ xətˁfæw ət-tæbhæh wæræh ətˁ-tˁof
the-boys why throw.3S.F.PERF the-ball behind the-wall
'Why did the boys throw the ball over the wall?'

These tests showed that INTERROG appears between the verb and the adverb (19) or the PP, thus confirming that it indeed remains in situ (SV-INTERROG-Adv).

(19) *Wh*-object in-situ with adverb

WOMAN CALL INTERROG YESTERDAY
'Whom did the woman call yesterday?'

4.3. NMMs IN CONTENT INTERROGATIVES. The following NMMs were observed in content questions – be it by themselves or in combination: brow furrow, chin up, headshake, head nod, and occasionally brow raise. However, in striking contrast to what has been described for other sign languages (e.g., ASL and LIS), none of these NMMs were frequently used. Even brow furrow, which has been observed as the main NMM of content questions in many sign languages, was used very infrequently. That is, a significant number of *wh*-questions in our dataset were only manually marked by the use of INTERROG. When present, these NMMs rarely extend beyond INTERROG (cf. the HKSL example in (9)). In (20), for instance, INTERROG is accompanied by a headshake (probably signaling uncertainty).

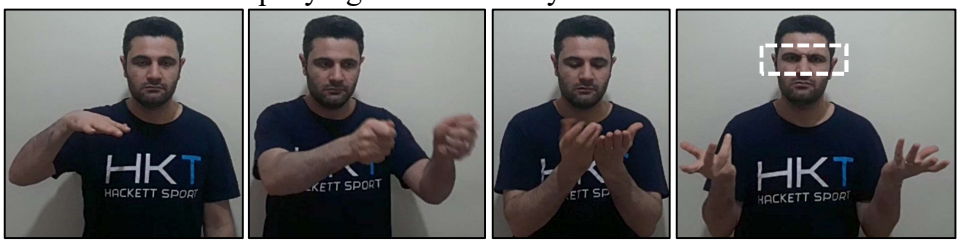
(20) Content question with headshake on INTERROG

headshake
BOY BOOK GIVE INTERROG
'Who did the boy give the book to?'

However, one participant used brow furrow consistently in his content questions. In his signing, brow furrow accompanied only INTERROG in some content questions (21), spread across the verb phrase in others (22), and occasionally spread across the whole clause, both when INTERROG re-

ferred to a non-subject and was not copied (23) and when there was *wh*-doubling, as is true in (24), where INTERROG refers to a subject.

(21) Brow furrow accompanying INTERROG only



brow furrow

BOY GIVE BOOK INTERROG

'Who did the boy give the book to?'

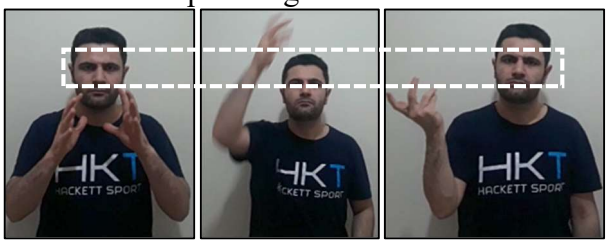
(22) Brow furrow spreading across the verb phrase

brow furrow

MAN PUNCH INTERROG

'What did the man punch?'

(23) Brow furrow spreading across the whole clause



brow furrow

BALL TOP INTERROG

'What is the ball on top of?'

(24) Brow furrow spreading across the whole clause with *wh*-doubling

brow furrow

INTERROG WALL BEHIND INTERROG

'What is behind the wall?'

Taken together, our results show that NMMs are neither used extensively nor consistently in STSL content questions. When present, they almost never spread beyond INTERROG.

Furthermore, the results from the grammaticality judgment task confirmed two important findings from the other two data sets (i.e., the narratives and sentence elicitation). First, *wh*-questions without the manual marker INTERROG are ungrammatical (25), independent of the presence and scope of a NMM. This finding is in line with what has been observed for other sign languages, i.e., that a manual marker is generally required for marking *wh*-questions (but cf. Petronio & Lillo-Martin 1997 for some exceptions in ASL). Second, *wh*-questions without NMMs are indeed rated as grammatical (26). This finding contrasts with what has been described for other sign languages studied to date, and it might be indicative of the fact that STSL lacks consistent 'question intonation', and that, instead, it relies on a manual marker alone to mark *wh*-questions. Third, *wh*-questions with spreading NMMs were generally considered ungrammatical (27) – with the notable exception of the participant mentioned above.

(brow furrow)
(25) *MAN EAT?
'What is the man eating?'

(26) MAN EAT INTERROG

brow furrow
(27) *MAN EAT INTERROG

Based on the observation that *wh*-NMMs are clearly optional in STSL, we propose that NMMs – in particular, brow furrow – are lexically specified for INTERROG, i.e., they are part of the sign's phonological make-up (other NMMs like headshake/head nod likely fulfil other, possibly pragmatic, functions; see (20) above). This implies that NMMs play a phonological role in STSL, not a syntactic one – again, in contrast to what has been argued for other sign languages, such as ASL and LIS. Yet, even with INTERROG, NMMs are clearly optional. We thus assume that they are frequently subject to phonetic deletion, similar to schwa-deletion observed in spoken languages.

5. Formal account of STSL content interrogatives. The results show that in STSL, the *wh*-sign remains in situ. This conclusion is based on the fact that there were no instances of clause-initial *wh*-objects (which would suggest leftward movement) or clause-final *wh*-subjects (which would suggest rightward movement). For *wh*-objects, further evidence for in situ placement comes from their position vis-à-vis clause-final adverbs, which follow INTERROG (19). Given that objects are clearly in situ, we extend this analysis to subjects, for which it can actually not be decided whether they are in situ or have moved leftwards. STSL thus seems to be the first sign language described to date to display consistent *wh*-in-situ in its content questions. For other sign languages, for which *wh*-in-situ has been described (e.g., ASL and TİD), this strategy exists alongside other strategies that involve movement.

Based on the patterns described in the previous section, we put forward the following formal account for content questions in STSL. First, we adopt the leftward movement hypothesis, i.e., the assumption that *wh*-signs move to Spec-CP on the left (or some other specifier in the left periphery of the clause). Since STSL is consistently *wh*-in-situ, we further assume that this movement occurs at LF in order for INTERROG to check its *wh*-feature against the *wh*-feature in C^0 under Spec-head agreement – similar to what has been proposed for other *wh*-in-situ languages like Chinese (see Figure 3).

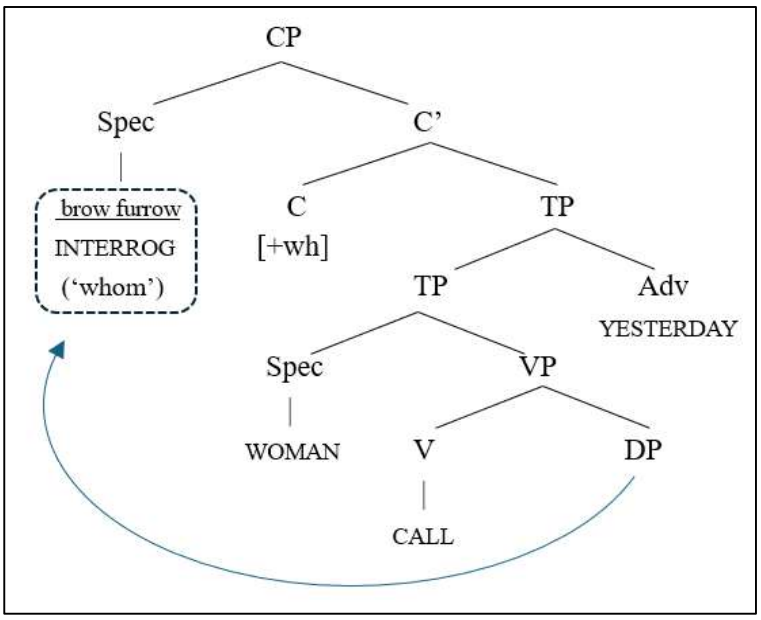


Figure 3. Structure of object *wh*-question (ex. 19) in STSL, showing LF movement of INTERROG

Further support comes from *wh*-doubling. As we have seen, STSL allows for *wh*-doubling – albeit infrequently. Out of the total 358 content questions, 17 (4.7%) involved *wh*-doubling. Interestingly, of these 17 instances of *wh*-doubling, 16 involved *wh*-subjects ('who' / 'what'). Moreover, there was a single instance of a copied *wh*-adjunct ('where'). There were no instances of copied *wh*-objects in the data. Three participants, two females and one male (aged 12, 21, and 43) produced such doubling structures, one of which is shown in (28).

(28) Example of *wh*-doubling involving *wh*-subject

brow raise

INTERROG NEXT-TO WALL INTERROG

'Who is next to the wall?'

Despite the limited number of doubling instances, prosodic evidence suggests that two types of doubling must be distinguished (cf. Kuhn & Wilbur 2006 for Croatian Sign Language). In the first type, a clear prosodic break precedes INTERROG, and we thus analyze the final *wh*-copy as a tag right-adjoined to CP (option ① in Figure 4). In contrast, for those cases that do not involve a prosodic break, we assume that the final *wh*-copy serves emphatic purposes (cf. French *qui est-ce qui*, 'who is-it who'). In this case, we analyze the *wh*-copy as a focus double hosted by a focus projection on the right (option ② in Figure 4) – not unlike what has been proposed for ASL by Petronio and Lillo-Martin (1997) (cf. Figure 1b).

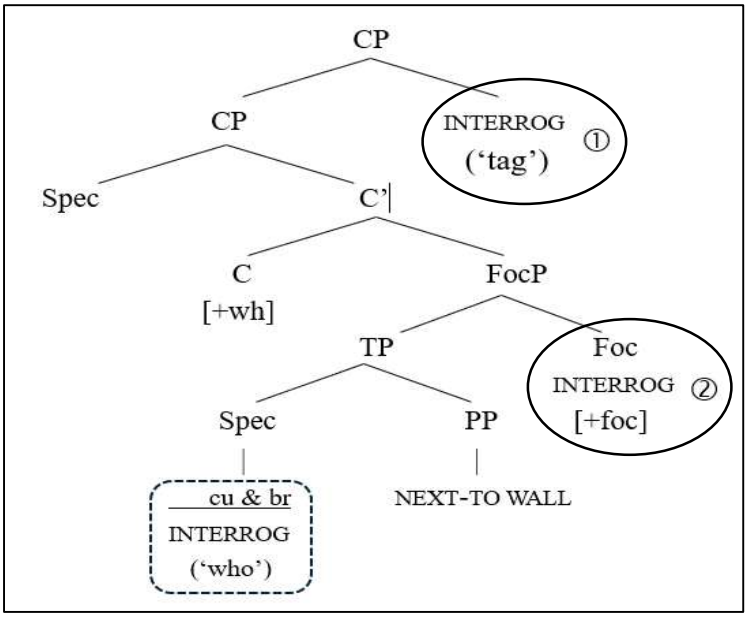


Figure 4. Structure of *wh*-doubling in STSL (ex. 28) involving ① tag or ② focus double ('cu' = chin up; 'br' = brow raise)

6. CONCLUSION. We investigated content interrogatives in STSL, an emergent sign language from Iran. Our data collected by means of narratives, sentence elicitation, and grammaticality judgments reveal that *wh*-signs remain consistently in situ in STSL. This finding is interesting from an intra-modal typological perspective, as to date, no sign language has been described that would be "purely" *wh*-in-situ (while *wh*-in-situ is very common across spoken languages). Rather, in most sign languages studied thus far, *wh*-signs have a tendency to occur clause-finally. Furthermore, STSL allows for *wh*-doubling, similar to other sign languages, although doubling is infrequent in our dataset and occurs almost exclusively with *wh*-subjects.

Our data also indicate that NMMs are only infrequently used in STSL content questions. Again, this finding is unusual from an intra-modal typological perspective, as it has not been reported for other sign languages. Finally, we emphasize that the observed patterns do not reflect the structure of the surrounding spoken language, Khuzestani Arabic, which typically exhibits overt leftward *wh*-movement.

The fact that STSL, a young sign language, presents us with clear patterns regarding the formation of *wh*-questions – patterns that diverge from those attested in the surrounding spoken language – is highly informative from a language emergence perspective, as it reveals that, similar to what has been described for other emerging sign languages, the grammaticalization of gestural elements and the crystallization of systematic syntactic structure need not take very long (Sandler, Meir, Padden & Aronoff 2005; Kocab & Senghas 2021).

References

Aboh, Enoch O. 2004. *The morphosyntax of complement-head sequences: Clause structure and word order patterns in Kwa*. Oxford: Oxford University Press.

Aboh, Enoch O. & Roland Pfau. 2010. What's a wh-word got to do with it? In Paola Benincà & Nicola Munaro (eds.), *Mapping the left periphery: The cartography of syntactic structures, Vol. 5*., 91–124. Oxford: Oxford University Press.

Aboh, Enoch O., Roland Pfau & Ulrike Zeshan. 2005. When a wh-word is not a wh-word: The case of Indian Sign Language. In Tanmoy Bhattacharya (ed.), *The yearbook of South Asian languages and linguistics 2005*, 11–43. Berlin: Mouton de Gruyter.

Brunelli, Michele. 2011. *Antisymmetry and sign languages: A comparison between NGT and LIS*. Amsterdam: University of Amsterdam dissertation. Utrecht: LOT.

Cooperrider, Kensy, Natasha Abner & Susan Goldin-Meadow. 2018. The palm-up puzzle: Meanings and origins of a widespread form in gesture and sign. *Frontiers in Communication*. 3:23. https://doi.org/10.3389/fcomm.2018.00023

Cecchetto, Carlo, Carlo Geraci & Alessandro Zucchi. 2009. Another way to mark syntactic dependencies: The case for right-peripheral specifiers in sign languages. *Language* 85. 278–320.

Dryer, Matthew S. 2013. Position of interrogative phrases in content questions. In Matthew S. Dryer & Martin Haspelmath (eds.), *WALS Online* (v2020.4) [Data set]. Zenodo. https://doi.org/10.5281/zenodo.13950591 (Available online at http://wals.info/chapter/93, Accessed on 2026-02-24.)

Huang, C. T. James. 1982. Move wh in a language without wh movement. *The Linguistic Review* 1(4). 369–416. https://doi.org/10.1515/tlir.1982.1.4.369

İşsever, Selçuk & Bahtiyar Makaroğlu. 2013. Wh-movement in Turkish Sign Language. In E. Arik (ed.), *Current directions in Turkish Sign Language research*, 167–189. Cambridge, UK: Cambridge Scholars Publishing.

Kelepir, Meltem. 2021. Content interrogatives: Theoretical and experimental perspectives. In Josep Quer, Roland Pfau & Annika Herrmann (eds.), *Routledge handbook of theoretical and experimental sign language research*, 232–265. New York, NY: Routledge.

Kocab, Annemarie & Ann Senghas. 2021. Language emergence: Theoretical and empirical perspectives. In Josep Quer, Roland Pfau & Annika Herrmann (eds.), *Routledge handbook of theoretical and experimental sign language research*, 636–663. New York, NY: Routledge.

Kocab, Annemarie, Ann Senghas & Jennie Pyers. 2022. From seed to system: The emergence of non-manual markers for wh-questions in Nicaraguan Sign Language. *Languages* 7(2). 137. https://doi.org/10.3390/languages7020137

Kuhn, Ninoslava Šarac & Ronnie B. Wilbur. 2006. Interrogative structures in Croatian Sign Language. *Sign Language & Linguistics* 9(1-2). 151–167.

Miyagawa, Shigeru. 2010. *Why agree? why move?* Cambridge, MA: The MIT Press.

Neidle, Carol, Judy Kegl, Benjamin Bahan, Debra Aarons & Dawn MacLaughlin. 1997. Rightward wh-movement in ASL. In Dorothee Beerman, David Leblanc & Henk van Riemsdijk (eds.), *Rightward movement*, 247–278. Amsterdam: John Benjamins.

Petronio, Karen & Diane Lillo-Martin. 1997. WH-movement and the position of Spec-CP: Evidence from ASL. *Language* 73. 18–57.

Rizzi, Luigi. 1997. The fine structure of the left periphery. In Liliane Haegeman, L. (ed.), *Elements of grammar. Handbook in generative syntax*. Dordrecht: Kluwer, 281-337.

Sandler, Wendy, Irit Meir, Carol Padden & Mark Aronoff. 2005. The emergence of grammar: Systematic structure in a new language. *Proceedings of the National Academy of Sciences* 102. 2661–2665.

Tang, Gladys. 2006. Questions and negation in Hong Kong Sign Language. In Ulrike Zeshan (ed.), *Interrogative and negative constructions in sign languages*, 198–224. Nijmegen: Ishara Press.

Wilbur, Ronnie B. 1995. What the morphology of operators looks like: A formal analysis of ASL brow-raise. In Leslie Gabriele, Debra Hardison, Robert Westmoreland (eds.), *FLSM VI: Formal Linguistics Society of Mid-America: Vol. 2. Syntax II & semantics/pragmatics*, 67–78. Bloomington, IN: IULC Publications.

Wilbur, Ronnie B. 2000. Phonological and prosodic layering of nonmanuals in American Sign Language. In Karen Emmorey & Harlan L. Lane (eds.), *The signs of language revisited: An anthology to honor Ursula Bellugi and Edward Klima*, 213–244. Mahwah, NJ: Lawrence Erlbaum.

Zeshan, Ulrike. 2004. Interrogative constructions in signed languages: Cross-linguistic perspectives. *Language* 80. 7–39.

Zeshan, Ulrike. 2006. *Interrogative and negative constructions in sign languages*. Nijmegen: Ishara Press.