

Quexistentials in Catalan Sign Language (LSC)

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Abstract

This paper explores the morphology and the licensing conditions of a particular type of indefinite pronouns, namely those that are morphologically identical or closely related to question words. We refer to these forms as indefinite quexistentials. In this paper, we present the findings of two studies that investigate these forms in Catalan Sign Language (LSC). The first study is based on elicitation with three deaf LSC consultants, while the second consists of an online experiment which collected judgments from 50 deaf and hard-of-hearing signers of LSC. Our research identifies the semantic categories and the environments in which indefinite quexistentials are possible in LSC. This investigation contributes to the understanding of the indefinite-interrogative affinity, providing the first detailed description of indefinite quexistentials in a sign language.

Keywords: indefinite-interrogative affinity, quexistentials, elicitation, online experiment, Catalan Sign Language

1 Introduction

In many of the world's spoken languages, indefinite pronouns are either identical or morphologically closely related to question words (Ultan 1969; Haspelmath 1997). This formal resemblance is commonly referred to as the indefinite-interrogative affinity (Bhat 2004; Gartner 2009; Onea 2021). However, despite claims that in some sign languages (SLs) certain elements may function as indefinites and as question words, the extent to which the indefinite-interrogative affinity is found in the signed modality has not been thoroughly investigated (Zeshan 2006a; Zeshan & Palfreyman 2017).

This paper explores this issue by focusing on Catalan Sign Language (LSC) indefinites. It presents the findings of two studies that investigate the morphology and licensing of indefinite pronouns that bear morphological resemblance to question words. In the first study, we used different methods of direct elicitation to collect data from three deaf LSC consultants. Subsequently, an online experiment was carried out to validate the reliability of our consultants' intuitions.

The results of our investigation show that indefinites that overlap morphologically with interrogative pronouns are attested in the following semantic categories: person, quantity, cause and time. Moreover, they are licensed in the same environments for all four categories. Specifically, they are found in polar questions, in the antecedent of conditionals, in positive episodic sentences and under modals.

Our research provides evidence that the indefinite-interrogative affinity is found in the signed modality, and it shows that, in LSC, the distribution of indefinites that are morphologically related to interrogative words follows a pattern similar to one already described for some spoken languages.

The paper is structured as follows. Section 2 gives the necessary background to the indefinite-interrogative affinity in signed and spoken languages. Section 2.1 discusses the cross-linguistic distribution and the licensing conditions of indefinites that resemble question words in spoken languages. Section 2.2 presents the results of a cross-linguistic survey conducted on a sample of 30 SLs. The two sections that follow shift the focus to LSC. Section 3 reports the results of our data elicitation sessions on the morphology and licensing of indefinites that are formally related to question words. Section 4 describes an experimental study in which we collected further intuitions about the use of these type of indefinites in LSC. Section 5 presents a general discussion and Section 6 concludes the paper.

2 Background

2.1 Quexistentials in spoken languages

Spoken language indefinites typically occur in series and they tend to consist of an indefiniteness marker, which is a formal element shared by the members of a series (e.g., *some-*, *any-*, and *no-* in English; *-bait*, *i-*, *edo-*, and *-nahi* in Basque), and a stem, which indicates the ontological/semantic category (Haspelmath 1997). Indefiniteness markers might consist of an affix, a particle or sequence of particles, reduplication and stem modification (Haspelmath 1997). On the other hand, stems may derive from generic nouns such as ‘thing’, ‘time’ or ‘place’ —e.g., *something* and *sometime* in English, *enlloc* ‘anywhere’ (lit. ‘in-place’) in Catalan—, from the numeral ‘one’ —e.g., *someone* in English, *nessuno* ‘nobody’ (lit. ‘no-one’) in Italian— and, more commonly, from question words (Haspelmath 1997). Indeed, research has shown that indefinite pronouns are often morphologically very similar or even identical to interrogative pronouns (Moravcsik 1969; Ultan 1969; Haspelmath 1997).

To illustrate, take the (partial) inventory of interrogative and indefinite pronouns of Basque in Table 1, noting that languages differ with respect to the number of indefinite series and the ontological categories they encode.

Table 1: Basque interrogative and indefinite pronouns (Haspelmath 1997: 315)

Semantic category	Interrogative	<i>-bait-series</i>	<i>i-series</i>	<i>edo-series</i>	<i>-nahi-series</i>
Person	nor	nor-bait	i-nor	edo-nor	nor-nahi
Thing	zer	zer-bait	e-zer	edo-zer	zer-nahi
Place	non	non-bait	i-non	edo-non	non-nahi
Time	noiz	noiz-bait	i-noiz	edo-noiz	noiz-nahi
Manner	nola	nola-bait	i-nola	edo-nola	nola-nahi
Determiner	zein	–	–	edo-zein	zein-nahi

In Haspelmath’s (1997) typology of indefinite pronouns the distribution of the different indefinites’ series is influenced by the function taken by the indefinite form. For example, the Basque *-bait* series is used in the specific unknown and irrealis non-specific functions. The series *edo-* and *-nahi* are used in free choice and indirect negation functions. The *i-* series, finally, is used for negative polarity functions (conditionals, questions, comparatives...).

Depending on their morphology, indefinites that are formally related to inter-

rogatives are usually broken down into two categories, bare and complex.¹ Bare forms are those formally identical to interrogatives, as the Hopi word *hak* ('who'/'someone'), which has both indefinite and interrogative functions. Complex forms are those that involve the interrogative along with some additional morphology that marks the indefinite reading, as the Basque indefinites in Table 1 above. For example, the forms *zerbait* ('something') and *norbait* ('someone') are formed by the interrogative words *zer* ('what') and *nor* ('who') along with the indefiniteness marker *-bait*.

Considering that, cross-linguistically, only a few indefinite pronouns are not synchronically related to any other element (e.g., the Catalan indefinites *cap* 'no' and *mai* 'never'), Haspelmath (1997) formulated the generalization that indefinites are almost always derived forms. Indeed, he further observed that when indefinite and interrogative pronouns are formally similar but not fully identical, the indefinite is always the element that is morphologically more complex.² This is the reason why indefinites that exhibit a formal similarity with question words are commonly referred to as interrogative-based indefinites (Haspelmath 1997) or as *wh*-indefinites (Bruening 2007). Alternatively, the more neutral terms indeterminate pronouns (Kuroda 1965) and quexistentials (Hengeveld et al. 2022) have also been proposed. In this study, we follow Hengeveld et al. (2022) and adopt the term quexistentials to refer to those elements that can be used either as interrogatives or as existential indefinites. To make each of the interpretations explicit, we will use the labels *ex of quex* (for the existential interpretation) and *qu of quex* (for the interrogative one).

In its original formulation in Hengeveld et al. (2022), the term quexistential refers to those words that allow interrogative and existential uses without any additional overt morphology. Under this definition, the Basque indefinites mentioned earlier would not be considered quexistentials. In this study, we broaden the definition of the term so as to include complex forms as well. Our motivation is as follows. As will be shown below, interrogatives and indefinites in SLs tend to co-occur with specific sets of non-manual markers (NMMs). Because of this, it is not immediately obvious if fully identical forms can be identified in any SL. To make these distinctions clear, we will use the labels bare and complex quexistentials. The term 'bare quexistentials' refers to cases where the only difference lies in the NMMs used. On the other hand, the term 'complex quexistentials' applies when the manual sign itself is not fully identical in the two readings. This may occur when the sign combines with other signs or when the sign undergoes phonological modifications.

1 The term 'complex *wh*-indefinites' is from Yun (2013).

2 This observation is also found in Moravcsik (1969: 77), who claimed "[i]f they [indefinite and interrogative pronouns] are partially similar it is the indefinite pronoun whose shape includes morphologically that of the question pronoun."

2.1.1 Cross-linguistic distribution

The indefinite-interrogative affinity is remarkably widespread among the world's spoken languages (Ultan 1969; Haspelmath 1997). Furthermore, it is observed in a variety of genetically and geographically unrelated languages. In Ultan's typology of interrogative systems (1969), 77 out of a sample of 79 spoken languages were found to show this type of affinity. In Haspelmath's typology of indefinite pronouns (1997), the indefinite-interrogative affinity is attested in 63 out of a sample of 100 spoken languages. In the WALS database, 194 out of a sample of 326 languages were reported to derive indefinites from interrogatives, with the languages of North America, Australia and Eurasia having mostly interrogative-based indefinites (Haspelmath 2013).

The paradigm of question words varies across languages, both in terms of size and with respect to the strategies employed to express different semantic categories. For example, languages may utilize basic question words or complex expressions (Haspelmath 1997; Mackenzie 2009). To illustrate, English lacks basic interrogative words for the category quantity ('how much?') and dual determiner ('which of the two?'), as well as for subcategories of location such as direction ('to where?') or source ('where from?'). Furthermore, languages may have specific question words for some semantic categories, while lacking the corresponding indefinites. For instance, English has a cause interrogative *why*, but not a cause indefinite pronoun. Instead, cause indefinites must be expressed using forms like *for some reason/for any reason*.

In some languages, all series of indefinites derive from interrogative pronouns; in other languages, only one of the series is formally connected to interrogatives; and yet in others the indefinite-interrogative affinity is not found. Languages in which indefinite and interrogative pronouns take the same or a similar form differ with respect to the type of affinity they allow: some have both bare and complex forms, and some have one type only (cf. Yun 2013 and Table 2). For example, Russian and Korean allow both types, see (1);³ Japanese and Basque allow complex forms only, see (2); Mandarin Chinese allow only bare forms, see (3); and Swahili and Maltese do not have indefinites related to interrogatives.

(1) a. Interrogative

Minho-ka **mwe**-l mek-ess-ni?
Minho-NOM what-ACC eat-PST-Q
'What did Minho eat?'

3 Abbreviations used in spoken language glosses: ACC = accusative; ASP = aspect marker; AUX = auxiliary; CL = classifier; DCL = declarative sentence ending; INDEF = indefiniteness marker; NEG = negation; NOM = nominative; PST = past tense; Q = question marker.

Table 2: Indefinite-interrogative affinity types, based on Yun (2013: 26)

	Bare	No bare
Complex	Korean	Basque
No complex	Mandarin Chinese	Swahili

b. Bare indefinite

Minho-ka **mwe-l** mek-ess-ta.
 Minho-NOM what-ACC eat-PST-DCL
 ‘Minho ate something.’

c. Complex indefinite

Minho-ka **mwe-nka-lul** mek-ess-ta.
 Minho-NOM what-INDEF-ACC eat-PST-DCL
 ‘Minho ate something.’

(Korean, Yun 2013: 25-26)

(2) a. Interrogative

Nor etorri da?
 who came AUX
 ‘Who came?’

b. Complex indefinite

I-nor ez.
 INDEF-who not
 ‘Nobody.’

(Basque, adapted from Etxeberria et al. 2021: 488)

(3) a. Interrogative

Ta yiwei wo xihuan **shenme**?
 he think I like what
 ‘What does he think I like?’

b. Bare indefinite

Ta yiwei wo xihuan **shenme**.
 he think I like what
 ‘He thinks that I like something.’

(Mandarin Chinese, Li 1992: 125)

2.1.2 Licensing conditions

The distinction between interrogative and existential uses of quexistentials has been argued to be related to the presence or absence of focus. Specifically, quexistentials have been claimed to always occur in focused environments in their interrogative interpretation (van Valin 1993; Haida 2008; Hengeveld et al. 2022). This means that, like other non-quexistential question words, they require obligatory focus marking (Haida 2008). By contrast, in their existential use, quexistentials are not focused and their distribution is subject to cross-linguistic variation.

Additionally, it has been argued that the distinction between bare and complex forms impacts the licensing conditions of the ex of quex (Yun 2013). In particular, while complex forms occur somewhat freely, bare indefinites (i.e., those identical in form to question words) are restricted with respect to the contexts in which they can occur. Yun (2013) distinguishes between languages where the ex of quex is restricted in terms of its position in the sentence and languages where the ex of quex only appears in the scope of certain licensors.

The first group includes languages in which the existential interpretation is restricted configurationally. This might be because the ex of quex is possible only inside the verb phrase, as it has been claimed for German and Dutch (Postma 1994),⁴ or because it is allowed only in non-fronted positions, as in Passamaquoddy (Hengeveld et al. 2022). In German, for example, indefinite quexistentials cannot occur at the beginning of the sentence (4-a). If a quexistential appears in a clause-initial position, it receives an interrogative reading, (4-b) (Haspelmath 1997).

- (4) a. Da kommt **wer**.
here come who
'Someone is coming.'
- b. **Wer** kommt da?
who come here
'Who is coming?' (German, Haspelmath 1997: 170)

The second category distinguished by Yun (2013) includes languages in which the existential reading is possible under the scope of certain licensing expressions. For example, in Mandarin Chinese and Russian, the ex of quex is licensed in the antecedent of conditionals, see (5-a) and (6-a); in polar questions, see (5-b) and (6-b); and in the scope of certain modals, see (5-c) and (6-c). That said, the list of possible licensors varies from one language to another. For example, Mandarin Chinese, unlike Russian, licenses the ex of quex under negation (5-d). Other languages, such

⁴ As noted by Hengeveld et al. (2022), the ex of quex in Dutch might in fact be licensed outside the verb phrase, for instance when it is a contrastive focus or a contrastive topic.

as Santiago Laxopa Zapotec, allow the ex of *quex* in the antecedent of conditionals, but not under negation or in polar questions (Gomez-Jackson 2023).

- (5) a. Ruguo ta xihuan **shenme**...
 if he like what
 ‘If he likes anything...’
 b. Ta xihuan **shenme** ma?
 he like what Q
 ‘Does he like something?’
 c. Ta sihu xihuan **shenme**.
 he seem like what
 ‘He seems to like something.’
 d. Ta bu xihuan **shenme**.
 he NEG like what
 ‘He doesn’t like anything.’
 (Mandarin Chinese, Li 1992: 127-128, 131)

- (6) a. Esli **kto** pridet, zovi menja.
 if who come call me
 ‘If anyone comes, call me.’
 b. Ne prixodil li **kto**?
 not came Q who
 ‘Did anyone come?’
 c. Možet, **kto** prixodil.
 it may be who came
 ‘It may be that someone came.’ (Russian, Yanovich 2005: 321)

Additional licensors in Mandarin Chinese include non-factive predicates like *renwei* ‘think’ and *cai* ‘guess’, imperatives and future markers (Li 1992; Lin 1998; Bruening 2007; Chen 2018; Yang et al. 2022). The ex of *quex* is possible in similar environments in Vietnamese (Tran & Bruening 2013), whereas complex forms, which are also possible in this language, are not subject to any specific restriction.

While it is often claimed that bare forms cannot be used existentially in past and present declarative statements (Li 1992; Haspelmath 1997), recent studies have shown that they may also occur in positive episodic sentences (see Chen (2018) and Liu & Yang (2021) for bare forms in Mandarin Chinese and Sudo (2010), Kaneko (2011) and Alonso-Ovalle & Shimoyama (2014) for complex forms in Japanese). When occurring in such contexts, the forms are argued to behave like epistemic indefinites (Alonso-Ovalle & Menéndez-Benito 2015), in that they convey speaker’s ignorance about the identity of the individual that satisfies the existential claim, as

shown in (7).

- (7) Zhangsan mai-le san ben **shenme** shu.
Zhangsan buy-ASP three CL what book
'Zhangsan bought three books of a certain kind (the speaker does not know what kind it is)'. (Mandarin Chinese, [Chen 2018](#): 143)

2.2 Quexistentials in sign languages

The paradigms of interrogative signs are reasonably well described for a number of SLs. As noted in Zeshan's (2004; 2006a) cross-linguistic study of interrogative constructions, the size and structure of question word paradigms varies radically across SLs. Some languages have an extensive paradigm of interrogative pronouns. Other languages have only one general *wh*-sign which may appear alone or combine with other non-interrogative signs expressing the ontological category. For example, in Indo-Pakistani Sign Language (IPSL), the general interrogative may combine with the signs FACE, PLACE and TIME to convey the meanings 'who', 'where' and 'when' (Zeshan 2003; Aboh et al. 2005; Zeshan 2006c). Finally, there are languages that have a general interrogative word covering more than one ontological category, as well as specific *wh*-signs.

Additionally, it is well established that interrogative sentences in SLs use both manual and non-manual markers (NMMs). In fact, certain non-interrogative signs can be interpreted as question words when they co-occur with NMMs of content questions. For example, the question word for the category amount/quantity, which expresses the meaning 'how many', is encoded in many SLs by combining the sign NUMBER, MANY or COUNT with the NMMs of content questions and "[o]ther recurring pairs include the signs AGE to express 'how old', REASON to express 'why', and TIME to express 'when'" (Zeshan 2006a: 55).

The NMMs used in interrogative and indefinite contexts are not uniform across SLs (Quer et al. 2017: 676). While brow furrowing is considered one of the most common markers of content questions across SLs, there are languages such as Austrian Sign Language (ÖGS) and Croatian Sign Language (HZJ) for which the main markers are chin up and head forward (Schalber 2006; Lackner 2018). As noted by Zeshan (2004: 30), "content question nonmanuals are crosslinguistically more variable [than nonmanuals for polar questions] with respect to their form, degrees of obligatoriness, and scope regularities."

Unlike interrogative pronouns, SL indefinites have been substantially less investigated. In fact, while it has been claimed that some SLs use question words as existential indefinites, neither the licensing conditions nor the semantic categories in which they may occur have been adequately investigated. Similarly, it is also

not readily apparent whether Haspelmath's (1997) universal, according to which indefinite pronouns always constitute derived forms, can be taken to hold for SLs as well. Indeed, precisely because we cannot assume a specific answer to this question, we decided to adopt the label *quexistentials* (Hengeveld et al. 2022), which does not imply that the indefinite is always the derived element (unlike the term *wh*-indefinites).


2.2.1 A cross-linguistic survey

In Zeshan's (2006a) typology of interrogative and negative constructions, it is asserted that several SLs exhibit an indefinite-interrogative affinity akin to the one described for spoken languages. However, as Zeshan (2006a) and Zeshan & Palfreyman (2017) note, for most SLs, no information is available, so the scale of the phenomenon cannot be determined.

In order to obtain a first impression of the languages and the semantic categories in which the indefinite-interrogative affinity is possible, we conducted a search on a convenience sample of 30 different languages. Languages were selected based on the availability of data only and, in most cases, discussion of the features was rather superficial. The data gathered consisted mainly of articles and book chapters (most about interrogatives, only a few about indefinites), as well as online dictionaries and grammars. By conducting this survey, we pursued two main goals:

- determine the extent to which the indefinite-interrogative affinity is found in the signed modality;
- investigate whether Haspelmath's universal holds in those SLs in which interrogative and indefinite pronouns are formally related.

Out of the 30 SLs included in our sample, 11 were found to display some form of affinity between indefinite and interrogative pronouns. The list of SLs and the pronouns that allow both interrogative and indefinite uses is presented in Table 3.

⁵ The glossing conventions used in this article are as follows. The meaning of signs is given in small capitals. If more than a word is needed, the meaning of the sign is glossed with a hyphen between words (e.g., KEEP-SECRET corresponds to one LSC sign). Multimorphemic signs are glossed with a circumflex accent between the morphemes (CLASS^ROOM). Suppletive forms are glossed with a dot between each of the (non-segmentable) morphemes (KNOW.NOT). Where relevant, the handshape used to produce a sign is given after the gloss (WHICH-)⁵). Classifiers are glossed as CL: 'meaning of the classifier'. The gloss *QUEX.category* represents quexistentials and the semantic category they belong to. *QUEX* is used irrespective of whether the item has an existential or an interrogative function; semantic categories are represented by the following abbreviations: 'prs' for person; 'quant' for quantity; 'rsn' for reason; 'th' for thing; 'fut' and 'past' for future and past time.

Number subscripts represent person values; they can attach to pointing signs, glossed as ix

Table 3: Quexistentials in SLs; ‘-’ indicates that the affinity is either not found or not mentioned in the respective category.

Language	Acronym	QUEX.prs ⁵	QUEX.th	QUEX.loc
Australian Sign Language	Auslan	✓	-	✓
Brazilian Sign Language	Libras	-	-	-
British Sign Language	BSL	✓	-	✓
Catalan Sign Language	LSC	✓	-	-
Finnish Sign Language	FinSL/SVK	✓	✓	✓
Japanese Sign Language	NS/JSL	-	-	-
Kenian Sign Language	KSL	✓	-	-
New Zealand Sign Language	NZSL	✓	-	✓
Russian Sign Language	RSL	✓	-	-
Spanish Sign Language	LSE	✓	-	-
Ugandan Sign Language	UgSL	✓	-	-

As with spoken languages, quexistentials in the sign modality are attested in different geographic areas. With respect to the semantic categories in which they occur, most SLs have quexistentials in the person category, but languages with quexistentials in more than one category are also attested. For example, Australian Sign Language (Auslan) is argued to use the same sign for the interrogative and the existential function in the ontological categories person and location. The same pattern is attested in New Zealand Sign Language (NZSL) (McKee 2006) and British Sign Language (BSL) (Cormier 2012). Note, however, that these three languages are historically related, so some overlap between categories can be expected. That said, quexistentials are not covered exhaustively in the literature, so it is unclear if they are possible in semantic categories other than person, location and thing in most of the SLs in our sample. In fact, there are two languages, Japanese Sign Language

(‘index’), and to predicates. The subscripts _{-arc/straight/circ} represent the trajectory taken by a sign that modifies its path movement. SIGN++ stands for in situ reduplication of a sign, SIGN-rep for reduplication with movement and SIGN-SIGN-SIGN for punctuated reduplication of a sign (i.e., when the full path movement of the sign is repeated at each iteration, cf. Horton et al. 2015). The gloss [SIGN]_{ipsi} stands for a sign produced on the ipsilateral side of the signing space; [SIGN]_{contra} stands for a sign articulated on the contralateral side.

Non-manuals are indicated using overlines. They are annotated only where relevant for the discussion. The length of the line indicates the scope of the NMM and its form is identified by the following abbreviations: ‘bf’ = brows furrowed; ‘br’ brows raised; ‘cd’ = corners of the mouth down; ‘cu’ = chin up; ‘mth’ = mouthing.

(NS) and Brazilian Sign Language (Libras), argued to use quexistentials (Zeshan 2004) for which we could not find any indication of the categories in which they occur.

Researchers have argued that NMMs are, usually, the only distinction between the interrogative and the existential function. For example, in NZSL, the two interpretations are differentiated by context, mouthing and the presence or absence of interrogative NMMs (McKee 2006). Similarly, the distinction between the two readings in Finnish Sign Language (FinSL) is claimed to lie in the facial expression and the position of the head, “with nonmanual interrogative marking resulting in a question word interpretation, while the absence of non-manual interrogative marking leads to an indefinite reading” (Savolainen 2006). Note that NMMs of indefiniteness are not considered in these publications. Yet for LSC, Barberà (2021) noted that the existential reading of the bare quexistential is licensed by the NMMs used in contexts of indefiniteness. In LSC, these markers include sucking the cheeks in, pulling the corners of the mouth down and, sometimes, a shrug (Barberà 2015, 2016).⁶

When the interrogative derives from a non-interrogative sign, the two signs may also differ in the movement parameter. According to Zeshan (2004, 2006a), some SLs derive question words from non-interrogative signs by modifying the NMMs and repeating the movement of a non-interrogative sign. This is the case of the Turkish Sign Language (TİD) signs PLACE and WHERE (Zeshan 2006b), which differ in that the interrogative sign adds a repeated tremolo movement. Repeated movement is in fact a common phonological feature of question words in many SLs, irrespective of whether they are derived forms or not (cf. Zeshan 2004; for NS, see also Morgan 2006). As noted before, indefinite markers in spoken languages may also involve reduplication and stem modification (Haspelmath 1997). The crucial distinction between sign and spoken languages lies in the fact that spoken language indefinites have been claimed to always constitute derived forms, whether derived from question words or from generic nouns (cf. Haspelmath 1997). As data from some SLs shows, interrogative signs may also derive from other elements in the language by adding the feature repeated movement.

With the exception of Barberà & Cabredo Hofherr (2018) and Barberà et al. (2018) for LSC, the licensing of the ex of quex is very rarely addressed in the literature. For example, for Ugandan Sign Language (UgSL), it is noted that the indefinite function is somehow limited, but the contexts that make existential interpretations available are not explicitly identified (cf. Lutalo-Kiingi 2014: 232).

To conclude, our survey showed that the indefinite-interrogative affinity is found in the signed modality, but we could not evaluate the exact extension of the

⁶ The NMMs used in indefinite contexts, just like the ones used in interrogative contexts, are subject to cross-linguistic variation (Barberà & Cormier 2017).

affinity in SLs, nor was it possible to compare the distribution of quexistentials across languages, contexts and semantic categories. As a consequence, it is not immediately clear whether most of the generalizations posited for spoken languages do apply to SLs as well. Because of these limitations, we decided to conduct fieldwork to collect more detailed, comparable data from specific SLs. The next two sections present our findings on LSC, which is the first SL we investigated. Our research consisted of two phases. First, we worked with deaf consultants to identify the environments that make existential interpretations available and describe the morphology of quexistentials. We summarize our findings in Section 3. In the second phase, which we describe in detail in Section 4, we conducted an online experiment aimed at cross-checking the judgments obtained in the first phase with a larger population of signers.

3 Study 1: data elicitation

LSC is a language argued to have quexistentials in the person category, a bare form, which can mean either ‘who’ or ‘someone’, and two complex quexistentials, the compounds $QUEX.prs^{\wedge}QUEX.quant$ and $QUEX.prs^{\wedge}IX_{3pl}$ ⁷ meaning ‘someone’ or ‘some people’ (Barberà & Quer 2013; Barberà 2016; Barberà & Cabredo Hofherr 2018; Barberà et al. 2018; Barberà 2021). These forms are presented in Figures 1, 2 and 3.

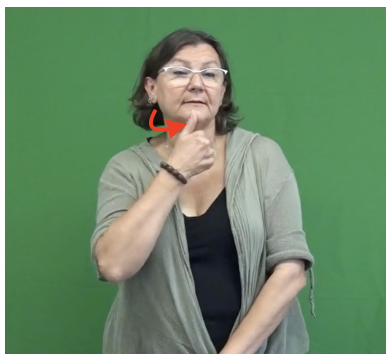


Figure 1: Existential use of $QUEX.prs$



Figure 2: Complex quexistential $QUEX.prs^{\wedge}QUEX.quant$



Complex quexistential

Indefinites can be articulated in high or in low spatial locations. In LSC, the contrast between high and low loci is used to overtly express epistemic (non-)specificity (Barberà & Quer 2013; Barberà 2015). A referent is epistemically specific when the signer is able to identify it, and non-specific otherwise. If the referent is

⁷ In the notation used by the authors, these forms are glossed as $WHO^{\wedge}SOME$ and $WHO^{\wedge}IX_{3pl}$.

non-specific, the indefinite is localized at a high spatial location. Specific discourse referents, on the other hand, are associated with the lower part of the frontal plane. The sign WHO is a body-anchored sign, so it cannot be spatially modified. In the compounds, the plural pronoun IX_{3pl} and the form $QUEX.quant$ are localized at a high spatial location (Barberà & Quer 2013). Non-specific indefinites co-occur with a darting gaze directed towards the upper frontal space. When produced in an upper location, indefinites combine with NMMs involving the lower part of the face, which consist of sucking in the cheeks and pulling the corners of the mouth down, sometimes combined with a shrug (see Figure 3). According to Barberà (2015) and Barberà et al. (2018), for the compound $QUEX.prs^{\wedge}QUEX.quant$ to be used, the identity of the referent must be unknown to both the signer and the addressee (see Barberà et al. 2018 for more specific licensing conditions). The contexts that license the use of indefinite $QUEX.prs$, by contrast, have not yet been identified.

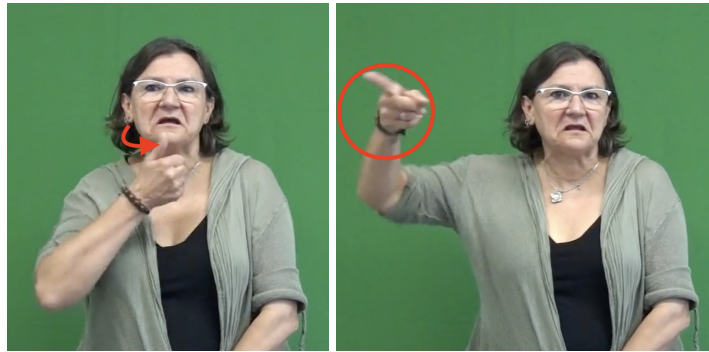


Figure 3: Complex quexistential $QUEX.prs^{\wedge}IX_{3pl}$

To examine if quexistentials are equally productive in semantic categories other than person, we conducted production and acceptability judgment tasks with three deaf LSC consultants. The purpose of our research was two-fold:

- to establish the inventory of indefinite pronouns in LSC;
- to determine the distribution and the interpretation of quexistentials in LSC (the ones already identified, and possibly others).


3.1 Method

Data for this study was obtained through linguistic elicitation. Elicitation sessions were conducted with three deaf LSC consultants, two men and a woman. They were all born and raised in Catalonia and use LSC on a daily basis. Two of them acquired LSC from birth and the other acquired it before the age of 6.

This study was approved by the Ethics Committee of the Faculty of Science at the University of Amsterdam and consultants gave informed consent. Prior to the elicitation sessions, they were sent the information letter and the consent form through the Qualtrics platform. They were provided with these materials in both written Spanish and LSC. The LSC version of these documents was signed and videotaped by one of the researchers of this paper, who is a hearing signer of LSC.

Since the paradigm of question words of LSC had already been described in previous investigations (Quer et al. 2005; Alba 2016; Cañas Peña 2020), we did not undertake any specific task to collect this data. The list of interrogative signs commonly presented in these studies is provided in Table 4 below.

Table 4: Inventory of *wh*-words in LSC

Semantic category	Gloss	Video
Person	WHO	[osf.io/ht7ps]
Thing	WHAT	[osf.io/39vy4]
Location	WHERE	[osf.io/3peza]
Quantity	HOW-MANY	[osf.io/wrzav]
Time	WHEN.past	[osf.io/8xv93]
	WHEN.fut	[osf.io/2au9g]
Manner	HOW	[osf.io/j6pzm]
Cause	WHY	[osf.io/psraz]
	REASON	[osf.io/djkbq]
Determiner	WHICH- 	[osf.io/c67vn]

According to Haspelmath, spoken languages tend to express the following ontological categories by means of basic question words: person, thing, property, location, quantity, time and manner. In addition to these, LSC further expresses the categories cause ('why?') and determiner ('which?') by simple means.⁸ In LSC, the category time is expressed by two different signs, depending on whether the time reference is related to the past or to the future (Quer et al. 2005). The notion of cause is typically conveyed by the sign WHY, but the sign REASON, while normally

⁸ The sign WHICH-OF-TWO, which is used to express the category dual determiner and it may occur in alternative questions, was not included in this research. However, it is worth noting that discussion during elicitation sessions showed that, like in other signed and spoken languages (Savolainen 2006; McKee 2006; AnderBois 2012; Szabolcsi 2015), there is a parallelism between disjunction/indefinites and questions. In LSC, the sign WHICH-OF-TWO may be used both in alternative questions (IX₂ STAY GO WHICH-OF-TWO? 'Are you staying or are you leaving?') and in disjunctive constructions (AIRPLANE TICKET CAN SHOW PHONE PAPER WHICH-OF-TWO 'You can either present the plane ticket on your phone or printed').

not included in the inventory of LSC *wh*-signs, may also be used. Therefore, we also considered this sign in our study. The category property (‘what kind?’), by contrast, is not expressed in LSC by means of a basic question word. As in other SLs, the form of some interrogative signs coincides with that of non-interrogative signs. In LSC, the manual forms used in the time category match the articulation of the markers of past and future and the forms used in the categories quantity and reason coincide with the nouns NUMBER and REASON.

In order to study indefinite forms, we conducted fieldwork. Our aim was to elicit indefinites for each of the semantic categories expressed in the question paradigm, namely: person, thing, location, time, manner, cause, quantity and determiner. For each category, we considered the environments known to impact the form of the indefinite. Specifically, we prompted participants to use indefinites in polar questions, in the scope of possibility and necessity modals (epistemic and deontic), in the antecedent of conditionals, in affirmative episodic sentences and in the context of direct negation. We did not expect indefinite pronouns to be used in comparative constructions, which is yet another environment that may be considered when studying the distribution of indefinite forms (cf. Haspelmath 1997). Our expectation was confirmed in a first elicitation round, during which consultants expressed comparatives by using strategies that did not involve indefinite pronouns. Therefore, we did not investigate this environment further. The environments tested in the elicitation sessions are illustrated with English sentences in Table 5.

Table 5: Environments tested in the elicitation sessions

Environment	Example
Polar question	‘Has anyone/someone come?’
Deontic necessity modal	‘I have to meet someone at the office.’
Deontic possibility modal	‘You can contact anyone .’
Epistemic necessity modal	‘You must have seen someone .’
Epistemic possibility modal	‘There seems to be someone outside.’
Antecedent of conditional	‘If someone comes, I’ll take care.’
Positive episodic sentence	‘ Someone greeted me on the street.’
Negation	‘ Nobody came to help us.’

Elicitation sessions were carried out with either two or all three consultants at the same time. Data was collected combining different techniques of direct elicitation, including (contextualized) productions, association and translation tasks and judgments tasks (Matthewson 2004; Bohnemeyer 2015). First, consultants were presented a discourse context in LSC and they were asked to provide a

continuation for it. To constrain the amount of potential productions and prompt the targeted forms, the researcher first presented a possible continuation, but left a gap for the indefinite form and ask consultants to provide it. To make sure the task was understood, the researcher would either mouth or (partially) fingerspelled the meaning of the targeted form. Alternatively, a non-quexistential indefinite would be provided. In subsequent rounds, consultants suggested continuations with indefinite forms themselves. Another task involved asking consultants to provide judgments on alternative (indefinite) signs suggested by the researcher. In particular, they were asked to indicate i) whether the sign or sequence of signs was possible in LSC (well-formed or simply a possible sign), and ii) whether the form was felicitous in the same scenario. Additionally, consultants were presented sentences containing an indefinite and asked to provide suitable contexts for them. As before, they were also asked to judge the adequacy of the production for alternative contexts suggested by the researcher.

Elicitation sessions were conducted in LSC in order to avoid the influence of Spanish or Catalan. They were followed by elicitation interviews (Berthelin 2020; Bochnak & Matthewson 2020), which allowed for in-depth discussion about the articulation and meaning of the forms.

The data was collected at Universitat Pompeu Fabra in Barcelona. Part of the productions discussed were videotaped to create the survey that was distributed to deaf participants in the second phase of our investigation (see Section 4).

3.2 Results



3.2.1 Indefinite signs in LSC

Indefinites in LSC may be formally similar to generic nouns (8), the numeral ONE (9) and question words (10).

- (8) Generic nouns:
PERSON [osf.io/dh9vj]
'someone'
- (9) Numeral ONE:
ONE [osf.io/cva8f]
'someone'
- (10) Question words:
QUEX.past [osf.io/7gxqb]
'sometime in the past'

The use of these strategies has already been described for other SLs. For example,

for human unknown referents, Italian Sign Language (LIS) uses the forms PERSON and ONE, which is similar to the numeral but adds a circular movement (Branchini & Mantovan 2020). In BSL, the person category indefinite has the same handshape and orientation as the numeral ONE, but it adds a slight tremoring movement (Cormier 2012). Indefinites of the semantic category thing, in turn, may use the sign SOME or THING. ASL also has an indefinite with the same articulation of the sign ONE, but in ASL, this form is used both with the categories of person and thing (Neidle et al. 2000). Besides, the degree of tremoring motion and the intensity of the NMMs that co-occur with this form are in relation to the degree of (un)identifiability of the referent (Neidle et al. 2000).

The signs SOME, ANY and NOTHING- form the basis of the three major series of indefinites in LSC. ANY is restricted to free choice uses and NOTHING- is used under negation (cf. Section 3.2.3).

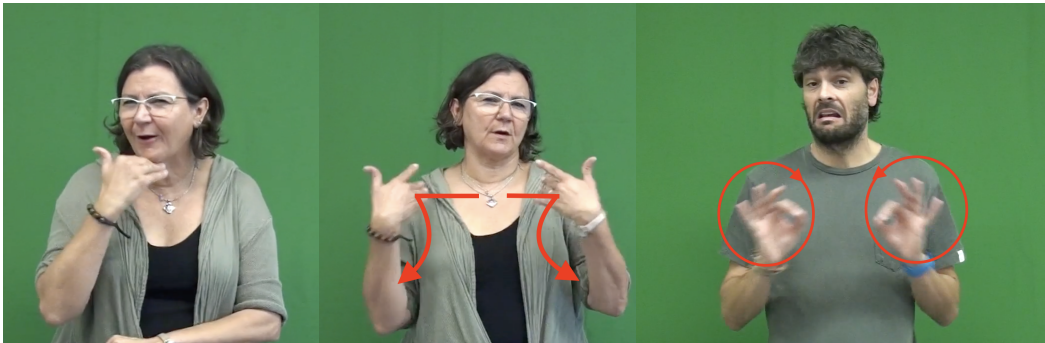



Figure 4: SOME

Figure 5: ANY

Figure 6: NOTHING-

Signs exhibiting a formal similarity with question words, generic nouns and the numeral ONE, may combine with each other or with the indefinite markers in Figures 4 to 6. For example, LSC indefinites might combine a question word with a generic noun (11), the numeral ONE with a generic noun (12-a) and (12-b) and the numeral ONE with the indefinite marker SOME (13). Combinations of three signs are also possible, as in (14), but such combinations do not constitute compounds.

- (11) Question word+generic noun:
 QUEX.prs^PERSON [osf.io/nxjg5]
 ‘someone’
- (12) Numeral ONE+generic noun:
 a. DAY^ONE [osf.io/6ja4v]
 ‘sometime’
 b. ONE^PERSON [osf.io/hqprn]
 ‘someone’

- (13) Numeral ONE+indefinite marker SOME:
 ONE^SOME [osf.io/8qks3]
 ‘something’
- (14) Numeral ONE+generic noun+indefinite marker SOME:
 ONE PLACE SOME [osf.io/76ps3]
 ‘somewhere’

LSC is not the only SL that uses more than one manual sign to express indefiniteness. For example, Sign Language of the Netherlands (NGT) and German Sign Language (DGS) have been reported to have indefinite pronouns resulting from a grammaticalized combination of the numeral ONE and the generic noun PERSON (Pfau & Steinbach 2006). DGS uses other compounds for the person category, such as SOME^PERSON (Nuhabaoglu & Kubus 2020). Combining two markers is not exclusively used in SLs. As noted in Haspelmath’s (1997) typology of spoken language indefinites, there are a few languages which use the numeral ‘one’ as an indefiniteness marker together with interrogative pronouns (e.g., *einhver* ‘somebody’ in Icelandic is formed from *ein* ‘one’ and *hver* ‘who’).

A signer’s choice between simple forms, like the ones shown in examples (8) to (10), and complex forms, like those in examples (11) to (14), depends both on the semantic category and the environment in which the indefinite occurs. Because our focus is on quexistentials, below we concentrate on those indefinites which are formally similar to question words and provide further details about the semantic categories and the contexts in which they occur.


3.2.2 Quexistentials in LSC

As noted before, quexistentials of the person category have already been investigated in LSC –cf. Barberà & Quer (2013); Barberà et al. (2018)–. In our data collection sessions, we found that LSC has quexistentials in other categories not yet identified in prior literature. In particular, quexistentials are also possible in the categories time, quantity and cause. In the semantic category cause, there are two signs that can be used to form content questions, WHY and REASON. In LSC, only the sign REASON is a quexistential. Hence, the results presented below correspond to the judgments obtained for the sign REASON only. To make it clear that we are restricting ourselves to this sign, in what follows we will refer to its semantic category as reason, instead of cause.

Given that the signs commonly glossed as WHO, WHEN.past, WHEN.fut, HOW-MANY and REASON have both interrogative and indefinite uses, we will use the glosses QUEX.prs, QUEX.past, QUEX.fut, QUEX.quant and QUEX.rsn.

Question words corresponding to categories other than person, time, quan-



tity and cause are non-quexistential interrogatives. That is, the *wh*-signs, which roughly translate in English as ‘what’, ‘where’, ‘which’ and ‘how’, do not allow for existential uses. As such, they are considered ungrammatical in non-interrogative constructions, see (15) to (18).

- (15) *DISAPPEAR WHAT, GUILT IX₂.
Intended: ‘If something goes missing, you will be held responsible.’
- (16) *PASSWORD RETRIEVE CAN HOW.
Intended: ‘The password can be retrieved somehow.’
- (17) *IX₂ PICTURE WHICH-, SEND₁.
Intended: ‘If you have any pictures, send them to me.’
- (18) *IX₂ HOLIDAYS ONE WHERE, IX₁ WITH.
Intended: ‘If you go on vacation somewhere, I’ll go with you.’

These results indicate that LSC indefinites correspond to the so-called ‘mixed type’ (Haspelmath 2013). This means that i) the language has more than one series of indefinites, where one might be related to interrogatives and the other may not be; and ii) in some semantic categories, indefinites are related to question words (in other categories, they may be related to generic nouns or they may be special indefinites). In LSC, only the categories person, quantity, time and cause have indefinites which are morphologically related to interrogative signs of the same categories. There are also other series of indefinites which are not related to question words.

3.2.3 Licensing of indefinite quexistentials

LSC quexistential indefinites are licensed in the same environments in all categories, namely in polar questions, under modals, in the antecedent of conditionals and in positive episodic sentences. Table 6 summarizes the contexts and categories in which we found existential interpretations to be allowed.

Except for the sign REASON, the existential reading of the quexistential is not possible under negation. The categories person, thing and quantity would typically use the general negative non-quexistential indefinite marker NOTHING- (see Figure 6). The same sign may also be used in the categories manner and location, whereas the time category employs the sign NEVER instead. The use of NOTHING- in the semantic categories person and thing is illustrated in examples (19) and (20).

- (19) COME NOTHING- [osf.io/a2cmb]
‘Nobody came.’
- (20) IX₁ SEE NOTHING- [osf.io/w8cet]

Table 6: Quexistentials (bare and complex) in LSC across semantic categories and contexts

Category	Polar Q	Modals				Antecedent of condit.	Positive episodic	Negation
		Deontic		Epistemic				
		□	◇	□	◇			
Person	✓	✓	✓	✓	✓	✓	–	
Thing	–	–	–	–	–	–	–	
Location	–	–	–	–	–	–	–	
Quantity	✓	✓	✓	✓	✓	✓	–	
Time past/fut	✓	✓	✓	✓	✓	✓	–	
Manner	–	–	–	–	–	–	–	
Reason	✓	✓	✓	✓	✓	✓	✓	
Determiner	–	–	–	–	–	–	–	

‘I don’t see anything.’

In the existential reading, the quexistentials corresponding to the categories person, time and quantity may appear either bare or in combination with other signs, as shown in (21-a) and (21-b). That said, complex quexistentials (i.e., quexistentials that combine with other signs, as in (21-b)) are often the preferred alternative in the existential use. To our knowledge, LSC is the first SL for which complex quexistentials have been identified.

- (21) a. VIBRATION, SEEM QUEX.prs COME. [\[osf.io/qw5mx\]](https://osf.io/qw5mx)
 b. VIBRATION, SEEM QUEX.prs^{IX_{3pl}} COME. [\[osf.io/yvf9r\]](https://osf.io/yvf9r)
 ‘I feel a vibration, there seems to be someone outside.’

There is only one exception to this. Complex quexistentials are the only alternative in all four semantic categories when used in sentences containing deontic possibility modals with free choice readings. In this context, if a quexistential is used, it typically combines with the sign ANY (see Figure 5). Alternatively, the sign ANY may also occur alone and convey the same free choice inference. The person category quexistential may additionally combine with the plural pronoun or with the quantity quexistential. Additionally, the existential use of the bare form QUEX.quant is dispreferred also in polar questions. Again, the sign REASON differs from the rest in that it almost always combines with other sign(s) in its existential reading, not just under deontic possibility modals. The distribution of bare forms

in the categories person, time, quantity and reason is shown in Table 7.

Table 7: Licensing of bare quexistentials in LSC

Category	Polar Q	Modals				Antecedent of condit.	Positive episodic	Negation
		Deontic		Epistemic				
		□	◇	□	◇			
Person	✓	✓	-	✓	✓	✓	✓	-
Quantity	-	✓	-	✓	✓	✓	✓	-
Time	✓	✓	-	✓	✓	✓	✓	-
Reason	-	-	-	✓	✓	-	-	-

As noted in Section 2.1.2, some languages may restrict the ex of quex configurationally, such that indefinite quexistentials cannot occur in fronted positions and the qu of quex is typically clause-initial. For LSC, we did not observe strict syntactic restrictions with bare forms. Question words, irrespective of whether they are quexistential or not, canonically appear in sentence final position, as in (22), but they can also appear in situ, as in (23) (Quer et al. 2005; Alba 2016).

(22) JOHN STEAL YESTERDAY WHAT
'What did John steal yesterday?' (Alba 2016: 95)

(23) JOHN WHAT STEAL
'What did John steal?' (Alba 2016: 98)

On the other hand, existential indefinites may appear both sentence-initially, as in (24), and in a non-fronted position, as in (25).

(24) QUEX.prs WANT PARTICIPATE, MUST BEFORE REGISTER. [osf.io/puhkx]
'If someone wants to participate, they must register beforehand.'

(25) COME QUEX.prs, IX₁ TAKE-CARE. [osf.io/68afu]
'If someone comes, I'll take care.'

As noted in Section 2.2, disambiguation between existential and interrogative readings may rely on non-manual markers. Below, we review the means that LSC employs to differentiate between the two uses of quexistentials.

3.2.4 Manual and non-manual marking

As noted before, question and indefiniteness marking in SLs result from the combination of manual and non-manual elements. As in other SLs, quexistential signs in LSC are co-articulated with NMMs, such as facial expressions and mouth actions. According to [Alba \(2016\)](#), the NMMs associated with content questions in LSC consist of a combination of the features furrowed brows, forward head tilt, body lean and raised chin. When the question word appears sentence finally, these markers might spread only over the question word or, optionally, over some adjacent signs or even the whole clause ([Alba 2016](#); [Cañas Peña 2020](#)). If the interrogative sign appears *in situ*, NMMs must spread from that position to the end of the clause. Our data aligns with Alba's observations, as we found that furrowed brows was the most consistent NMM, and that this marker often scoped over adjacent signs.

As for indefiniteness marking, the NMMs that are typically described across SLs are restricted to the ones occurring in contexts of epistemic non-specificity, i.e., those in which the speaker lacks knowledge about the identity of the referent. For example, the NMMs that co-occur with non-specific indefinites in TID and, therefore, are absent on specific indefinites, are brow furrowing, lowered mouth corners, and averted eye gaze ([Kelepir et al. 2018](#)). ASL employs the NMMs wrinkled nose, furrowed brows, and a rapid head shake ([Bahan 1996](#); [Neidle et al. 2000](#)). As mentioned earlier, [Neidle et al. \(2000\)](#) observed that the intensity of these NMMs correlates to the degree of non-identifiability of the referent. According to [Barberà & Quer \(2013\)](#), [Barberà \(2015\)](#) and [Barberà et al. \(2018\)](#), the LSC quexistential $QUEX.prs^{\wedge}QUEX.quant$ conveys epistemic non-specificity and, as such, it co-occurs with NMMs of non-specific indefinites, namely sucking the cheeks in, pulling the mouth ends down and a darting gaze directed towards an upper location, sometimes combined with a shrug. In our data, the non-manual element mouth corners down did not occur across all the environments considered. This non-manual occurred often in positive episodic sentences and under epistemic possibility modals. Less frequently, it occurred also under deontic possibility modals, in the antecedent of conditionals and under epistemic necessity modals, but its use was never observed under deontic necessity modals. Furthermore, the use of shrugs did not occur in our data, irrespective of the semantic category. Additionally, we found that the NMM furrowed brows occurred often in all environments except in the antecedent of conditionals.⁹ In terms of scope, NMMs typically spread over other signs and, often, even the whole clause. Therefore, we do not consider these elements as general markers of indefiniteness or non-specificity in LSC, but rather as markers of lack of knowledge (cf. [Lackner \(2018\)](#) for markers of uncertainty in ÖGS). This would explain why the marker mouth corners down may occur in contexts in

⁹ This is not surprising, as the antecedent of conditionals is marked by raised brows in many SLs.

which the signer commits to the existence of the referent but its identity is not known (as in positive episodic sentences, see (26)), but not in those in which the signer does not commit to the existence of the referent (as in deontic necessity modals, see (27)).


- (26) $\frac{\text{YESTERDAY SUBWAY } \frac{\text{QUEX.prs } \text{3SEE}_1\text{-rep.}}{\text{mth}}}{\text{cd}}$ [osf.io/vm3fb]
 ‘Yesterday, someone was looking at me repeatedly on the subway.’
- (27) $\frac{\text{IX}_{3a} \text{ JUAN PROBLEM LIST A-LOT, MUST } \frac{\text{IX}_{3pl} \wedge \text{QUEX.prs}_b \text{ } \text{3bHELP}_{3a.}}{\text{mth}}}{\text{bf}}$ [osf.io/4u7xm]
 ‘Juan has many problems, someone should help him.’

Finally, quexistentials were typically accompanied by mouth actions, whether mouthings, which are mouth patterns derived from spoken language words, or mouth gestures, which correspond to mouth movements formed within a SL (Crasborn et al. 2008). Mouthings were extremely common both in interrogative and indefinite uses of the quexistentials of the categories person, quantity and reason. Specifically, indefinite quexistentials were produced with the voiceless (and sometimes reduced) Spanish words *alguien* ‘someone’ and *cualquiera* ‘anyone’ in the person category; *algunos* ‘some’, *alguien* ‘someone’ and *cualquier* ‘any’ in the quantity category; and (*algo*) *motivo* (*cualquier*)¹⁰ ‘(for some/any) reason’ in the semantic category reason. In the qu of quex, the same manual signs were accompanied by the silent words *quién* ‘who’, *cuántos* ‘how many’ and *motivo* ‘reason’. By contrast, indefinites in the time category, whenever used bare, typically combined with mouth gestures, not with mouthing. This might be because, like in English, in Catalan and Spanish there is no concise and direct correspondence for meanings such as ‘sometime/at some point in the future’. The use of mouth gestures may also be motivated by the fact that, across SLs, they are typically employed with (temporal) adverbials to indicate whether the future is distant or near.

In terms of their manual articulation, we did not observe any formal difference between existential and interrogative uses of bare quexistentials in the person category. In the quantity category, the two uses may, but need not, be distinguished by the direction of the movement. In the existential function, the sign typically moves laterally, whereas in the interrogative use, the movement of the sign typically goes outwards. For comparison, see sentences (28) and (29).

¹⁰ Sometimes, our consultants used the voiceless Catalan word *motiu* in the reason category. Because mouthing may also derive from Catalan, other signers would systematically use silent Catalan words in all semantic categories.

- (28)
$$\frac{\frac{\text{cu, mth}}{\text{bf}}}{\text{IX}_2 \text{ SON QUEX.quant}}$$
 [osf.io/dx6nj]
 ‘How many children do you have?’
- (29)
$$\frac{\text{br}}{\text{IX}_1 \text{ SON LOVE PUZZLE, IX}_1 \text{ IDEA CAN QUEX.quant BUY.}}$$
 [osf.io/2trfg]
 ‘My son loves puzzles, I might buy him some.’

The sign REASON does not undergo any phonological change. Yet, as already mentioned, it almost always occurs in complex expressions, such as SOME REASON, REASON NOTHING-, REASON ANY, ONE REASON. The time quexistential is more prone to variation, both in its existential and in its interrogative use. As in other languages that distinguish past and future reference in the interrogative paradigm, the amplitude of the movement may differentiate between near vs. distant past/future —cf. Zeshan (2004) for Spanish Sign Language (LSE)—. The same applies to existential uses. Moreover, if the period of time is somehow delimited (e.g., ‘sometime next year/this month’), the sign moves back and forth in the midsagittal plane. By contrast, if the time frame is unspecified (‘sometime’, ‘at some point’), the movement of the sign resembles that of the interrogative use, is produced in a high location and no back and forth movement is observed. Furthermore, when occurring under deontic possibility modals, the place of articulation of the indefiniteness marker ANY may assimilate with that of the future time quexistential. This is shown in example (30).

- (30)
$$\frac{\frac{\frac{\text{mth}}{\text{cd}}}{\text{bf}}}{\text{IX}_2 \text{ PILL CAN QUEX.fut}^{\wedge} \text{ANY.}}$$
 [osf.io/3z2qn]
 ‘You can take the pills whenever you want.’

3.3 Summary

As discussed in Section 2.1, spoken language indefinites typically derive from interrogative pronouns, from generic nouns or from the numeral ‘one’. In this section, we have shown that LSC indefinites may similarly show a formal connection with interrogatives, with generic nouns and with the numeral ONE. Furthermore, like Russian and Korean, LSC allow both bare and complex forms in the semantic categories in which quexistentials are attested. To our knowledge, LSC is the first SL for which the use of complex quexistentials has been described. That is, unlike other SLs in which this type of indefinites has been documented, LSC not only

has indefinites that are identical to question words, but also indefinites that are morphologically related to question words, although not fully identical to them.

In terms of licensing, bare quexistential indefinites are allowed under modals, in the antecedent of conditionals and in polar questions, but not under negation (here, again, behaving like Russian). Besides, like in Mandarin Chinese, quexistentials in LSC are also possible in positive episodic sentences. Therefore, the findings presented so far prove that the connection between indefinite and interrogative words is not limited to spoken languages. Moreover, these results show that the distribution of LSC bare quexistentials follows a pattern similar to one already known from spoken languages (see Table 8).

To investigate whether these findings, which are based on our consultants' intuitions, were confirmed by a larger sample of LSC signers, we carried out an online experiment. The next section details the results.

Table 8: The indefinite-interrogative affinity in Mandarin, Russian and LSC

	Mandarin	Russian	LSC
All series related to interrogatives	yes	yes	no
Complex quexistentials	no	yes	yes
Bare quexistentials	yes	yes	yes
Licensors			
Antecedent of conditional	yes	yes	yes
Modals	yes	yes	yes
Polar questions	yes	yes	yes
Negation	yes	no	no
Positive statements (epistemic indefinites)	yes	no	yes

4 Study 2: online experiment

In this section, we present the findings of an online experiment aimed to investigate whether the judgments obtained in the elicitation sessions were supported by a larger sample of LSC signers.

Data for this study was collected online through a Qualtrics survey. In order for participants to be included in the experiment they had to be i) deaf or hard-of-hearing, ii) of legal age, and iii) a signer of LSC, irrespective of the age of acquisition or whether they used other languages in everyday communication.

All the materials contained in this experiment, including the information letter, the consent form, the instructions and the stimuli were made available to participants in LSC. These signed productions were recorded with the three deaf signers of

LSC who participated as language consultants in the elicitation sessions described in Section 3. The information letter and the consent form were also made available in written Spanish.

As we will explain in detail below, we divided the experiment into two stages, each corresponding to a specific task for the participants. The crucial conditions involved signed productions that included a quexistential with an intended existential interpretation. We call this condition *QUEX-Statement*. In the first task, participants were asked to determine whether a signed production was a statement or a question. In the second task, participants had to assess the acceptability of the signed production. Our hypothesis was that statements containing quexistentials, *QUEX-Statement* items, would be identified as statements in the first task and deemed acceptable in the second task.

Before delving into the specifics of the experiment, we give an overview of the items tested in the *QUEX-Statement* condition, given the relevance of these items and the connection to the elicitation task discussed in Section 3.

4.1 The *QUEX-Statement* condition

The items tested in the condition labeled as *QUEX-Statement* are statements that include a quexistential. For this study, we focused exclusively on the environments and the semantic categories for which we obtained positive evidence in the elicitations conducted with our three LSC consultants.

In the semantic category time, we selected the quexistential referring to the future. As this sign cannot combine with past episodic contexts, this environment was not considered in the experiment. Polar questions were excluded from this task, because interpreting the sentence as a question would not inform us about the interrogative vs. indefinite use of the quexistential. Negated sentences were also not addressed in this study, as quexistentials were only possible with the sign REASON in this environment. The resulting combination of semantic categories and environments included in the *QUEX-Statement* condition is presented in Table 9.

4.2 Participants

A total of 50 self-reported deaf or hard-of-hearing LSC signers participated in this experiment (27 women; 43 deaf). The Ethics Committee of the Faculty of Science at the University of Amsterdam provided approval for this study and all participants gave informed consent. The link to the survey and a signed explanation of both its structure and the inclusion criteria were sent to 22 organizations of the Catalan deaf community, mostly deaf clubs. They were asked to distribute the link among their members. LSC researchers at Universitat Pompeu Fabra also collaborated in sharing

Table 9: Subconditions and semantic categories of *QUEX-Statement*; Subjects were exposed to one item per ✓

	Modal operators				Antecedent of conditionals	Positive episodic
	Deontic		Epistemic			
	□	◇	□	◇		
Person	✓	✓	✓	✓	✓	✓
Quantity	✓	✓	✓	✓	✓	✓
Reason	✓	✓	✓	✓	✓	✓
Time fut.	✓	✓	✓	✓	✓	—

the link through their internal channels to recruit participants. Participation was compensated with a 20€ Amazon gift card. The age of the subjects was collected in age intervals and most subjects were between 18 and 60 years old (18–30 = 14; 31–45 = 16; 46–60 = 13; 61–80 = 7). The majority of the subjects acquired LSC before the age of 9 and 80% of the subjects before the age of 18 (0–3 = 18; 4–9 = 7; 10–18 = 15; 19–30 = 3; 31+ = 3; NA = 4).

4.3 Materials and design


The stimuli for this experiment consisted of video recorded sentences signed by two deaf native signers of LSC. The survey included two tasks, Task 1 and Task 2, which involved a total of 100 stimuli. Task 1 consisted of 54 items, while Task 2 had 46. The complete list of materials can be found in Appendix A. Each task had two response options, and participants indicated their choice by clicking on one of them. Task 1 was a two-alternative forced-choice task, and it used labels for specifying the response choice (*pregunta* ‘question’ and *declaración* ‘statement’). Task 2 was a ‘yes/no’ task, and it used icons to specify the response (thumb up/thumb down). Each task had two versions, which we refer to as Survey A and Survey B. Participants were randomly assigned to one of the two versions. Participants were required to complete Task 1 first, and then, after an optional break, proceed to Task 2. The decision to use the same subjects for both surveys served two purposes. Firstly, it allowed for a direct comparison between tasks in the critical *QUEX-Statement* condition. Secondly, conducting the survey between-subjects across tasks would have necessitated a larger number of participants, which would

have been challenging to achieve given the limited pool of potential participants.¹¹

Before recruiting the participants, the survey was piloted twice to identify errors, estimate the time needed for completing the survey, and ask for feedback.

4.3.1 Task 1

The first task aimed at examining whether sentences containing a quexistential in LSC can be interpreted as statements. Of the 54 items, 27 correspond to questions and 27 to statements. Experimental materials were constructed as outlined in the list below.

- 23 statements (*QUEX-Statement*) verifying the existential interpretation of the quexistential. Only the environments and the semantic categories for which we obtained positive evidence in the elicitation sessions were considered (see Table 9).
- 6 questions (*QUEX-Question*) verifying the interrogative interpretation of the quexistentials: 1 question for each of the semantic categories in Table 9 [person, quantity, reason, time-fut.] and 2 for the category time-past.
- 21 baseline questions (*BASE-Question*) formed without quexistential signs:
 - 10 content questions, divided by semantic category: 2 questions for each of the 5 non-quexistential *wh*-signs: WHAT, WHERE, HOW, WHY, WHICH-.
 - 5 alternative questions, each using a different manual or non-manual strategy.
 - 6 polar questions: 3 expressed by means of non-manual markers only and 3 accompanied by the question particle YES-NO.
- 4 *Fillers*, corresponding to modal statements using non-quexistential indefinites, one for each of the following semantic categories: person, time-fut., thing, manner.

The stimuli used in survey A and B were the same for *BASE-Question*, *QUEX-Question*, and *Filler*. However, *QUEX-Statements* (statements containing quexistentials) varied between survey A and B. We give some relevant examples of each of the experimental conditions of Task 1 in Table 10. Each semantic category of

¹¹ The order of the tasks was not counterbalanced among participants and was fixed as Task 1 followed Task 2. However, we believe that this should not induce any priming effects and should not significantly impact the validity of our results for Task 2.

the *QUEX-Statement* condition is illustrated with a different environment, which is specified in parentheses before the example. For a full list of environments and semantic categories, the reader is referred to Appendix A.

Table 10: Experimental conditions of Task 1 divided by question type and semantic category. ‘-’ indicates that the distinction does not apply; ‘*’ indicates that it applies as fully described before.

Condition	Q-Type	Semantic category	Items	Example
<i>QUEX-Statement</i>	-	Person	6	(epistemic necessity) SURE <i>QUEX.prs</i> HELP ₁ . ‘Someone will help me for sure.’
	-	Quantity	6	(deontic possibility) IX ₂ TAKE-rep <i>QUEX.quant</i> ANY. ‘You can take as many as you want.’
	-	Reason	6	(epistemic possibility) ₃ ASK ₁ -rep CAN SOME <i>QUEX.rsn</i> . ‘He might insist on asking for some reason.’
	-	Time-fut.	5	(conditional) <i>QUEX.fut</i> PROBLEM ARISE, LET-KNOW ₁ . ‘If you ever have a problem, let me know.’
<i>QUEX-Question</i>	Content	*	6	YESTERDAY GAME WIN <i>QUEX.prs</i> ? ‘Who won the game yesterday?’
<i>BASE-Question</i>	Content	*	10	KEY KEEP WHERE? ‘Where do you keep the keys?’
	Alternative	-	5	IX ₂ LIKE MORE [MEAT] _{contra} [FISH] _{ipsi} ? ‘Do you prefer meat or fish?’
	Polar	-	6	LIBRARY WEEKEND OPEN YES-NO? ‘Is the library open on weekends?’
<i>Filler</i>	-	*	4	SEEM IX ONE PERSON CL: ‘pass’. ‘It seems that someone is passing by.’

4.3.2 Task 2

The second task aimed at determining whether sentences containing a quexistential with a non-interrogative interpretation were considered acceptable in LSC. In the following, we use the terms ‘grammatical’ and ‘ungrammatical’ to refer to sentences

that are acceptable and unacceptable in LSC, respectively. Importantly, participants were not required to determine whether a certain production was grammatical or not in the traditional sense implied in linguistics. Instead, they were simply asked to determine if a certain production was acceptable in LSC, as we fully explain below in Section 4.4.

This task contained 46 items, of which 31 were (presumably) grammatical and 15 ungrammatical. The 23 items in the *QUEX-Statement* condition were the same as those used in Task 1 (the ones used for Task 1 in version A of the survey were reused for Task 2 in version B, and vice versa). The *BASE-Grammatical* condition contained 8 sentences with non-quexistential indefinites corresponding to the categories person, thing and time-fut. In the *BASE-Ungrammatical* condition, the items were unrelated to indefinites. Stimuli in the *BASE-Grammatical* and *BASE-Ungrammatical* conditions were common to both versions of the survey.

4.4 Procedure

Participants' judgments were collected online. Before starting the survey, participants found the information letter and the consent form in LSC and in written Spanish. If participants clicked on the 'Yes, I consent' button, they were redirected to a sociolinguistic survey aimed at gathering the following information: gender, age group, hearing status, use of hearing devices, age of acquisition of LSC, competence in other languages and primary language of communication in daily life. Participants who reported being hearing, non-LSC signers or below the age of eighteen were directed to the end of the survey. At the beginning of each task, participants found a signed explanation on how to respond, followed by two training items. No written version of the instructions was provided.

In Task 1, participants were asked to respond whether the video recorded sentence on the screen was a statement or a question. To make sure the contrast was clear, they were presented with an example for each response option. At the same time, the two response options used in the task (the Spanish written words *pregunta* 'question' and *declaración* 'statement') were displayed on the screen, so that the written word could be associated with the sign and the example. Before starting the task, participants completed two practice questions to familiarize themselves with the response procedure and ensure that they had understood the task. After each practice item, the expected answer was provided. Items belonging to the *QUEX-Statement* condition were explicitly avoided in the practice questions.

In Task 2, participants were instructed to answer whether they consider the video recorded production an acceptable sentence in LSC. The two response options for this task were the thumb up and thumb down icons. These icons were selected because they are easily understandable and convey the idea of (non-)acceptability

Table 11: Experimental conditions of Task 2 divided by semantic category. ‘–’ indicates that the distinction does not apply.

Condition	Semantic category	Items	Example
<i>QUEX-Statement</i>	Person	6	(episodic) QUEX.prs CL: ‘person approaching’ GREET, IX ₁ KNOW.NOT. ‘Someone I don’t know greeted me on the street.’
	Quantity	6	(epistemic necessity) SURE NEIGHBOR CUP QUEX.quant THERE-IS-rep. ‘Surely, my neighbor has some glasses.’
	Reason	6	(deontic possibility) COURSE DEREGISTER CAN QUEX.ISN ANY. ‘You can leave the course for any reason.’
	Time-fut.	5	(deontic necessity) BUDGET MUST YEAR IX APPROVE QUEX.fut. ‘The budget has to be approved sometime this year.’
<i>BASE-Grammatical</i>	Person	3	YESTERDAY PERSON WALLET STEAL ₁ . ‘Yesterday, someone stole my wallet.’
	Thing	3	IX ₂ SOME KNOW, BETTER KEEP-SECRET. ‘If you find out something, keep it to yourself.’
	Time-fut.	2	IX ₂ CAN COME ANY- 8 , BUT TIME 8 AFTER. ‘You can come anytime, but after 8.’
<i>BASE-Ungrammatical –</i>		15	IF IX ₂ HOUSE STAY, IX ₁ EITHER. ‘If you stay home, me neither.’

clearly, without requiring additional written information. Participants were asked to select the thumb up icon if they found the sentence acceptable in LSC (literally, if the sentence ‘went with/conformed’ to LSC); and the thumb down icon if they consider it unacceptable (literally, if the sentence did not adapt to LSC). As in Task 1, the two response options were shown on the screen during the delivery of instructions. After discussing with our LSC consultants, we deliberately chose to avoid terms such as “grammatical/ungrammatical” or “good/bad” in the instructions. This decision was made because we anticipated that most participants would not have extensive expertise in linguistic terminology. Additionally, since many deaf individuals do not receive formal SL training during their education, they might be hesitant to provide rules of use that they themselves claim to be unfamiliar

with. Instead, we used the signs SUIT and ADAPT (to LSC) vs. SUIT-NOT and the sign illustrated in Figure 7, which might translate as ‘unfitting’. This sign was deliberately chosen to convey the concept of inappropriateness and represent ungrammaticality without employing technical terminology during the delivery of instructions. As in Task 1, participants completed two practice items before starting the task.



Figure 7: Sign UNFITTING

The order of presentation of the items was randomized for each participant in both tasks. Sentences were presented individually, and participants could play the video as many times as they wished. In both tasks, participants were required to select one of the two alternative responses provided, question vs. statement in Task 1 (see Figure 8); thumb up vs. thumb down in Task 2 (see Figure 9). While we anticipated that the experiment would take approximately 30 minutes to complete, there was no time limit imposed on participants.

4.5 Data availability

Stimuli, training items, data and analysis code are available open access on the OSF platform at https://osf.io/a8q6t/?view_only=f9bd08b264304c10833bef27e26b5f9d.

4.6 Data treatment and analysis

Data treatment and analysis were carried out in R (R Core Team 2021) using the Hmisc (Harrell Jr 2021) and lme4 (Bates et al. 2015) packages.

A total of 8 participants were excluded prior to the analysis because their performance did not meet the pre-established threshold. In particular, we removed participants who met at least one of the following exclusion criteria: (a) mean

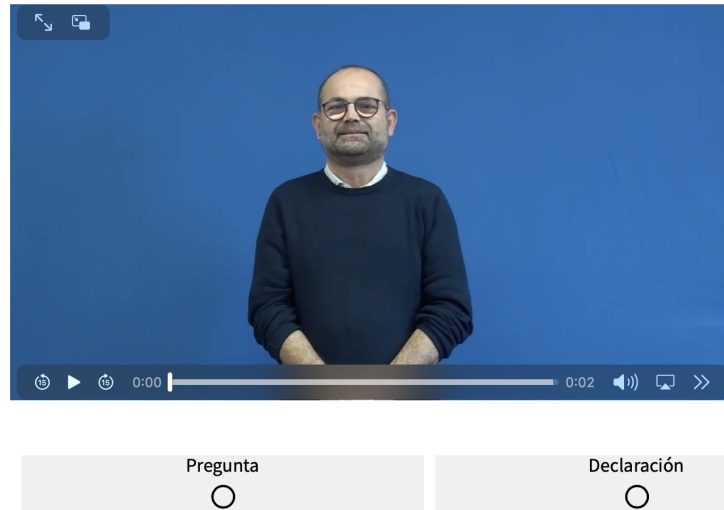


Figure 8: Screenshot of a stimulus and the alternative responses in Task 1

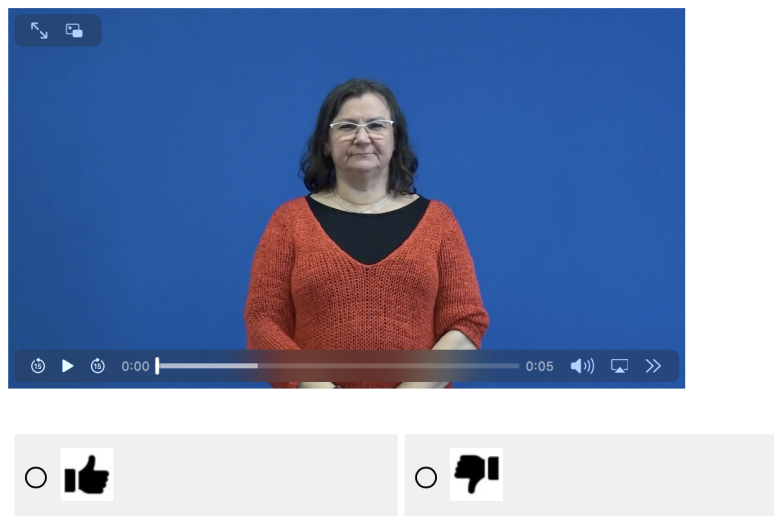


Figure 9: Screenshot of a stimulus and the alternative responses in Task 2

response 'Statement' higher than 15% in the *BASE-Question* condition in Task 1; (b) acceptance rate lower than 75% for *BASE-Grammatical* condition in Task 2. The decision to use these thresholds was based on the results of the elicitation study

described in Section 3 and previous research on LSC.¹²

We checked for potential variability among subconditions in Task 1 and Task 2. In Task 1, all the subconditions of *BASE-Question* items [alternative Q, content Q, polar Q] had means <3.40%, indicating that such subdivisions were not a relevant factor for the current experiment. Similarly, all the semantic categories of *QUEX-Statements* [person, quantity, reason, time] had no notable distinctions with means >92%.¹³

For Task 2, the *BASE-Grammatical* condition displayed some variability among its subconditions, as shown in Table 12. The *QUEX-Statement* subconditions displayed some variability, but all the means were higher than >82%. Since this would not affect our conclusions, we will not introduce these distinctions among *Subcondition* in the statistical analyses that follow. We will return to the variability among statements at the end of this section.¹⁴

Importantly, the *QUEX-Question* (M= 98.2%, 95% CI[94.9, 99.4]) items used in

12 The *BASE-Ungrammatical* condition was not included in our exclusion criteria. This decision was made because there could be different degrees of ‘acceptability’ for a signed production and participants might react differently. Establishing a reliable threshold for this condition prior to the experiment was thus not feasible. However, we conducted post-hoc analyses to check whether participants had responded as expected, as explained in footnote ??.

13 Interestingly, one *BASE-Question* item, corresponding to the polar question in (i), had a relatively high response ‘Statement’ rate of 17%.

- (i) $\frac{\text{bf}}{\text{SEE SOME}}$ [osf.io/rvs5e]
Do you see something?

The epistemic nature of (i) might have facilitated a reading along the lines ‘You maybe see something’, as opposed to ‘Do you see something?’. Moreover, across SLs, polar questions are typically associated with the NMMs brow raised and wide open eyes (Cecchetto 2012). However, it has been observed that in some languages, among which LSC, polar questions may display different combinations of non-manuals to mark speaker bias, including furrowed brows and forward body leans (Cañas Peña 2021). Indeed, out of the 6 polar questions that were part of our experiment, only 1 was accompanied by raised brows. Of the remaining 5, 3 contained a YES-NO question particle, which may have contributed to facilitating the identification of the clause type. Of the remaining 2 questions, the sentence in (i) was the only one marked just by brow furrowing. Hence, lack of a forward movement of the body might have led some participants to interpret the sentence as a statement.

14 One *BASE-Ungrammatical* item, corresponding to example (i) had a higher acceptance rate (M = 46%) compared to the other *BASE-Ungrammatical* items.

- (i) IX₁ CLASS ^ ROOM TOTAL 57 MAN ^ KID. [osf.io/tfyd2]
‘In my class, there are 57 kid in total.’

Example (i) was meant to be ungrammatical due to the lack of number marking on the sign KID. Because the sign co-occurs with a numeral, lack of number marking might be particularly subtle. Consequently, some participants may have deemed the sentence acceptable without recognizing the absence of number marking.

Task 1 had a uniformly high acceptance rate, indicating that the signs used for the *QUEX-Statement* condition were effectively signs with possible interrogative uses in LSC.

The analysis of responses to the test trials involved conducting pairwise comparisons between each target condition and all other conditions. Each comparison utilized a linear mixed-effect model with a binomial distribution, predicting responses based on the fixed effect of condition (2 levels; sum-coded). All models incorporated random intercepts for both participants and items, as well as random slopes for participants, while excluding random slopes for items due to convergence issues.¹⁵

The χ^2 and p -values presented in the results were derived from likelihood ratio tests, where the deviance of models containing the fixed effect of condition was compared to another model lacking the relevant effect but maintaining the same random effect structure. Bonferroni correction was applied to adjust p -values for multiple testing. Specifically, given that three comparisons were conducted, only p -values below 0.01 were considered statistically significant.

4.7 Results

4.7.1 Task 1

Figure 10 shows the mean ‘Statement’ proportion for the *QUEX-Statement*, *BASE-Question* and *QUEX-Question* conditions. The outputs of the statistical models and analyses are summarized in Table 13.

QUEX-Statement displays a high ‘Statement’ response rate ($M = 95.0\%$, 95% CI[93.5, 96.2]), while *BASE-Question* ($M = 1.93\%$, 95% CI[1.21, 3.10]) and *QUEX-Question* ($M = 1.59\%$, 95% CI[0.62, 4.01]) display a uniformly low response ‘Statement’ rate (i.e., a high response ‘Question’ rate). We conducted three pair-wise comparisons between the conditions, which are summarized in Table 14. The p -values were adjusted using Bonferroni correction to account for multiple comparisons. We found a significant difference between the *QUEX-Statement* and *QUEX-Question* conditions ($\chi^2(1) = 75.2$, adjusted- $p < 0.001$), as well as between the *QUEX-Statement* and *BASE-Question* conditions ($\chi^2(1) = 97.5$, adjusted- $p < 0.001$). However, there was no significant difference between the *QUEX-Question* and *BASE-Question* conditions

¹⁵ Models included a random intercept for *Item*, (1 | *Item*), and thus they allowed for different baseline intercept values for each level of *Item*. Without this term, the model would have assumed that all items have the same baseline response (i.e., the same intercept), which might not be a valid assumption. For example, if some items are inherently more difficult or easier to respond to than others, this would be captured by the random intercepts for *Item*. Without the (1 | *Item*) term, these differences in difficulty would be lumped into the residual error term, potentially inflating the error variance and making it harder to detect the true effects of our conditions.

Table 12: Subconditions for Task 1 and Task 2 with mean response ‘Statement’ for Task 1 and mean response ‘Grammatical’ for Task 2

Task	Condition	Subcondition	Mean [95% CI] (%)
1	<i>QUEX-Statement</i>	Person	92.1 [88.1, 94.8]
1	<i>QUEX-Statement</i>	Quantity	99.2 [97.2, 99.8]
1	<i>QUEX-Statement</i>	Reason	92.1 [88.1, 94.8]
1	<i>QUEX-Statement</i>	Time	97.1 [93.9, 98.7]
1	<i>QUEX-Question</i>	Content Q	1.59 [0.62, 4.01]
1	<i>BASE-Question</i>	Alternative Q	0.00 [0.00, 1.80]
1	<i>BASE-Question</i>	Content Q	1.90 [0.97, 3.71]
1	<i>BASE-Question</i>	Polar Q	3.57 [1.90, 6.64]
2	<i>BASE-Grammatical</i>	Person	92.1 [86.0, 95.6]
2	<i>BASE-Grammatical</i>	Thing	90.5 [84.1, 94.5]
2	<i>BASE-Grammatical</i>	Time	85.7 [76.7, 91.6]
2	<i>QUEX-Statement</i>	Person	83.3 [78.2, 87.4]
2	<i>QUEX-Statement</i>	Quantity	82.1 [76.9, 86.4]
2	<i>QUEX-Statement</i>	Reason	94.0 [90.4, 96.4]
2	<i>QUEX-Statement</i>	Time	92.9 [88.6, 95.6]
2	<i>BASE-Ungrammatical</i>	-	14.1 [11.6, 17.1]

($\chi^2(1) = 2.74$, adjusted- $p = 0.3$). These results suggest that participants interpreted sentences containing quexistential indefinites as statements. In contrast, questions containing quexistential and non-quexistential interrogatives (*QUEX-Question* and *BASE-Question*) were judged as questions, with no discernible difference between the two.

4.7.2 Task 2

Figure 11 shows the mean acceptance rate (i.e., the proportion of ‘thumb up’ responses) for the *BASE-Ungrammatical*, *QUEX-Statement* and *BASE-Grammatical* conditions. The outputs of the statistical models and analyses are summarized in Table 14.

The *BASE-Grammatical* (M= 89.9%, 95% CI[86.2, 92.7]) and *QUEX-Statement* (M= 87.9%, 95% CI[85.7, 89.8]) conditions display a uniformly relatively high acceptance rate. By contrast, the *BASE-Ungrammatical* condition has a low acceptance rate

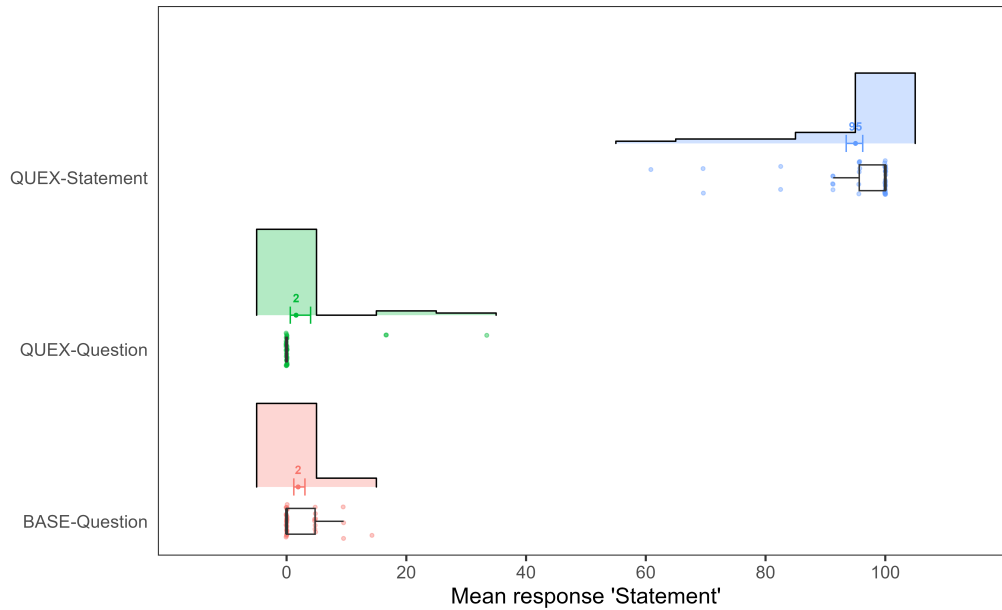


Figure 10: Mean response ‘Statement’ by experimental condition in Task 1. Histograms illustrate participant-level mean responses for each condition (10-point interval bins). Grand means are marked by thick bars with values, alongside 95% confidence intervals. Jittered raw data and boxplots further visualize response distributions. The median for each condition is shown as a bold horizontal line within the boxplot.

Table 13: Summary of the outputs of the statistical model and analyses. The model included condition as a fixed effect (level 1 vs. level 2; sum coded: 1=level 1 and -1=level 2) and a maximal random effect structure for Subject and a random intercept for Item. χ^2 and p -values were obtained via model comparison.

<i>Comparison</i>	<i>Estimate</i>	<i>95% CI</i>	$\chi^2(1)$	<i>p</i>	<i>adjusted p</i>
<i>QUEX-Statement vs. QUEX-Question</i>	7.34	[4.82, 9.86]	75.2	<0.001	<0.001
<i>QUEX-Statement vs. BASE-Question</i>	5.62	[4.46, 6.78]	97.5	<0.001	<0.001
<i>QUEX-Question vs. BASE-Question</i>	-2.17	[-5.00, 0.66]	2.74	0.1	0.3

(M=14.1%, 95% CI[11.6, 17.1]).¹⁶

¹⁶ As mentioned at the beginning of this section, the condition *BASE-Ungrammatical* was not included

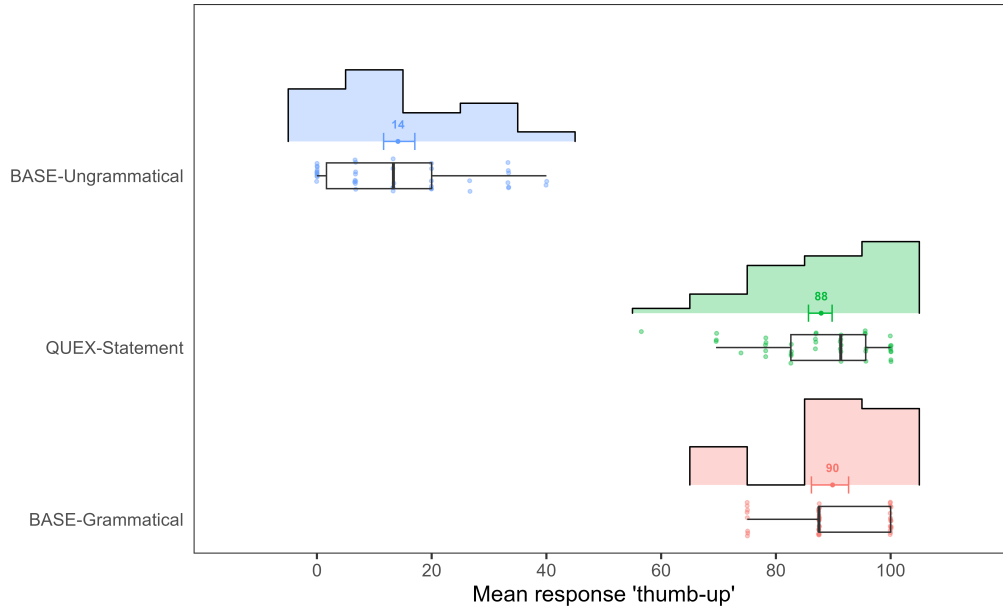


Figure 11: Mean response ‘thumb-up’ by experimental condition in Task 2. Histograms illustrate participant-level mean responses for each condition (10-point interval bins). Grand means are marked by thick bars with values, alongside 95% confidence intervals. Jittered raw data and boxplots further visualize response distributions. The median for each condition is shown as a bold horizontal line within the boxplot.

We carried out three pair-wise comparisons between the conditions, summarized in Table 14. p -values were adjusted using Bonferroni correction due to multiple comparisons. We found a significant difference between *BASE-Ungrammatical* and *QUEX-Statement* ($\chi^2(1) = 95.9$, adjusted- $p < 0.001$), as well as between *BASE-Ungrammatical* and *BASE-Grammatical* ($\chi^2(1) = 38.48$, adjusted- $p < 0.001$), while there was no difference between *QUEX-Statement* and *BASE-Grammatical* ($\chi^2(1) = 0.05$, adjusted- $p = 1$). These results suggest that sentences containing a quexistential were effectively judged as possible sentences in LSC, aligning with grammatical sentences, and clearly contrasting with ungrammatical ones.

in the exclusion criteria of the experiment. We carried out post-hoc analyses to check that the behavior of the participants was not anomalous. In particular, we selected the 5 *BASE-Ungrammatical* items with the lowest acceptance rate and checked the mean rate across subjects for these items. One participant accepted 2 out of 5 of these items and four other participants accepted 1 out of 5 of these items. Removing these five participants from the analyses did not affect the validity of our conclusions, and all significant differences remained unchanged.

Table 14: Summary of the outputs of the statistical model and analyses. The model included condition as a fixed effect (level 1 vs. level 2; sum coded: 1=level 1 and -1=level 2) and a maximal random effect structure for Subject and a random intercept for Item. χ^2 and p -values were obtained via model comparison.

<i>Comparison</i>	<i>Estimate</i>	<i>95% CI</i>	$\chi^2(1)$	<i>p</i>	<i>adjusted-p</i>
<i>BASE-Ungrammatical vs. QUEX-Statement</i>	-2.55	[-3.01, -2.10]	95.9	<0.001	<0.001
<i>QUEX-Statement vs. BASE-Grammatical</i>	0.05	[-0.42, 0.53]	0.05	0.82	1
<i>BASE-Ungrammatical vs. BASE-Grammatical</i>	-2.43	[-2.95, -1.92]	38.48	<0.001	<0.001

4.7.3 QUEX-Statements in Task 1 and 2

Both Task 1 and Task 2 included a *QUEX-Statement* condition, but with distinct items for each task. This condition was thus tested under two different experimental regimes. In the first, participants had to determine if *QUEX-Statement* items were statements or questions. In the second, participants had to determine if *QUEX-Statement* items were acceptable or not. The behavior of each participant by experimental task is summarized in Figure 12.

Overall, we observe that only 19% of the participants exhibit a higher rate for Task 2. One potential explanation for this observation is that acceptability judgments may be more nuanced than a simple forced-choice task. Factors such as the naturalness of the signed sentence and alternative ways of expressing the corresponding sentence could have influenced the result.¹⁷

As mentioned earlier, there was some variability among the semantic categories of the *QUEX-Statement* condition (Table 12). As described in Section 4.3, statements stimuli were constructed based on their semantic category and their environment. Each ‘Environment-Semantic Category’ pair was associated with just one item per participant, which differed among Survey A and Survey B. As a result, generalizations are difficult to make¹⁸ and here we simply outline relevant contrasts which

¹⁷ We carried out a Pearson’s product-moment correlation analysis to explore the association between the mean rates of participants in Task 1 and Task 2. The analysis revealed a correlation coefficient of 0.29 (95% CI [-0.004, 0.54]). The calculated test statistic was 1.99 (df = 47) with the p -value = 0.053. This suggests a modest positive correlation between the two variables, though the p -value is marginally above the conventional significance threshold of 0.05 and the 95% CI includes a correlation coefficient of zero.

¹⁸ For instance, while the Quantity subcondition in Task 1 had the highest mean of 99.2%, the mean acceptance rate in Task 2 was the lowest with value 82.1%.

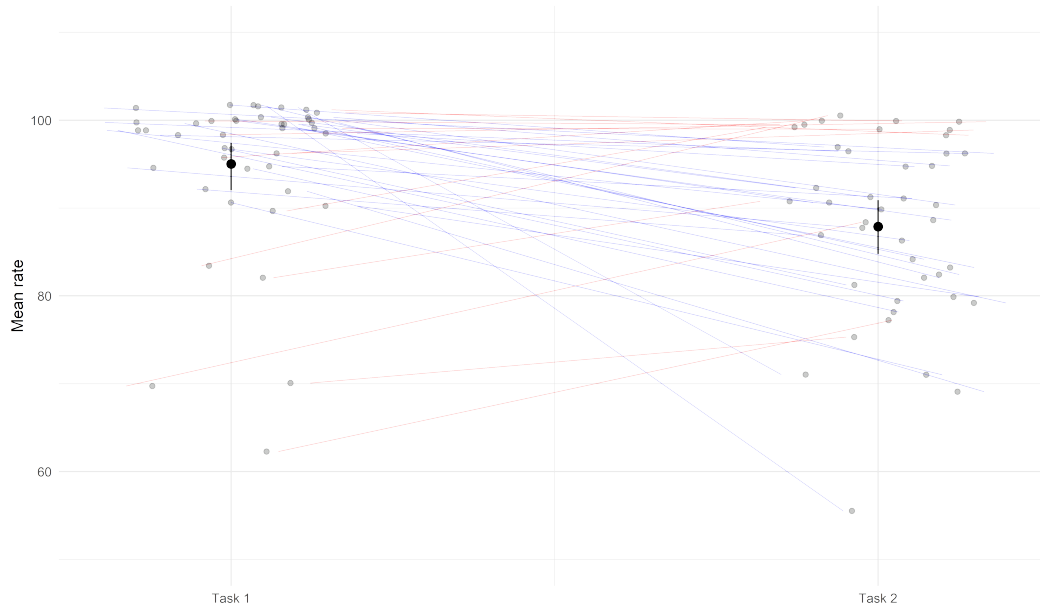


Figure 12: For each participant, the mean rate that they gave to *QUEX-Statement* items is displayed, on the left for Task 1 and on the right for Task 2. A red line indicates that the mean rate given in Task 1 was higher than or equal to the mean rate given in Task 2 for that participant. A blue line indicates that the rate given in Task 1 was lower than that given in Task 2.

might warrant future, more comprehensive, studies.¹⁹

Figure 13 displays the mean rates of *QUEX-Statement* by Semantic Category and Environment for Task 1 and Task 2. Notably, the epistemic possibility environment exhibits the lowest ‘Statement’ response rate in Task 1 and the least degree of variation between Task 1 and Task 2. To further investigate this contrast, let us consider the example in (31):

$$(31) \quad \text{IX}_1 \text{ SEEM } \overbrace{\text{QUEX.prs}}^{\text{mth}} \text{ OUTSIDE IX.} \quad [\text{osf.io/tqxd6}]$$

a. ‘There’s seems to be someone outside.’

¹⁹ Preliminary, we can observe that participants’ behavior across tasks remained consistent for the different ‘Environment-Semantic Category’ pairs. Note that when an item of a given environment and semantic category was judged as a statement in Task 1, the corresponding item of the same semantic category and environment in Task 2 was also judged as grammatical in Task 2 88% of the time (809 out of 918 judgments). Similarly, if it was judged as a question in Task 1, the corresponding one was judged as grammatical in Task 2 83% of the time (40 out of 48 judgments).

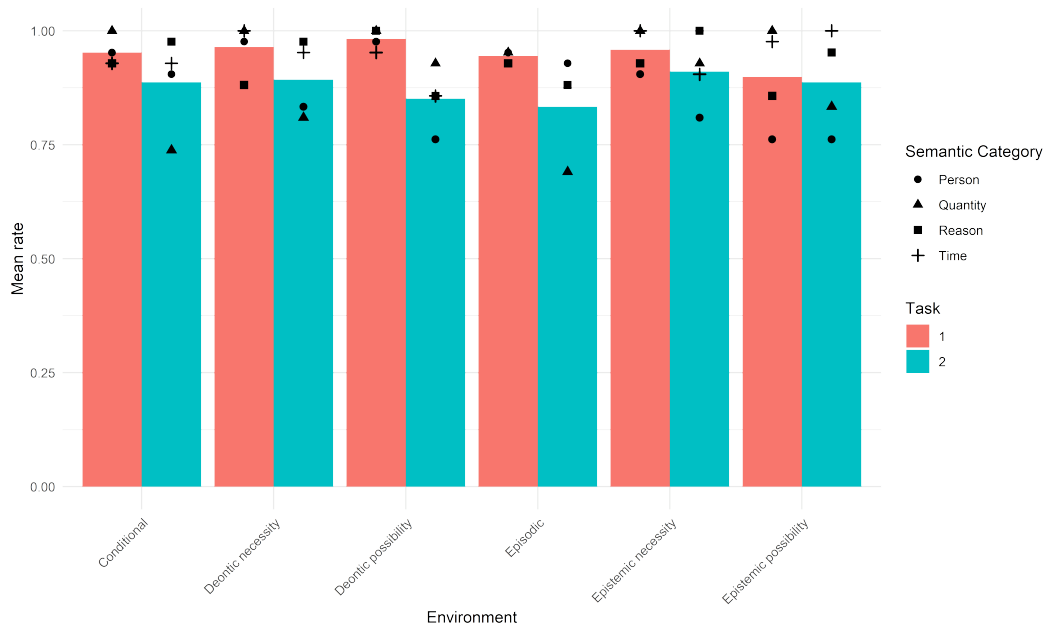


Figure 13: Mean rates by Semantic Category and Environment in Task 1 and Task 2. Each bar represents the mean of 1 example for each of the 4 semantic categories aggregated across Survey A and B. The means comprise a total of 8 examples per bar and 2 examples per shape. In Task 1, the mean rate corresponds to the mean response ‘Statement’; in Task 2, the mean rate corresponds to the mean response ‘thumb-up’.

- b. ‘Could there be someone outside?’
- c. ‘Who is outside?’

We intended to test the *quexistential* statement interpretation in (31-a). However, the epistemic nature of (31) might have facilitated a reading along the lines of (31-b). Importantly, the *QUEX.prs* sign in (31-b) is interpreted existentially, and a question interpretation along the lines of (31-c) seems to be clearly ruled out. The reason for the lack of variation between Task 1 and Task 2 in the epistemic possibility environment could be attributed to the fact that readings like (31-b), although not statements, are still considered grammatical. In fact, the acceptance rate for this condition in Task 2 aligns with the others.

Finally, we examined the potential impact of participant age, age of LSC acquisition and gender. We did not find any discernible differences, except for one minor effect related to age of acquisition and gender. Age of acquisition was collected using the following ranges: 0-3; 4-9; 10-18; 19-30; 31+, NA. The two most represented categories were ‘0-3’ ($n=15$) and ‘10-18’ ($n=13$). Interestingly, the ‘0-3’ group tended

to have a lower rate for both Task 1 and Task 2, for what concerns statements, compared to the ‘10-18’ group.²⁰ As for gender, 27 participants identified as ‘female’, 23 as ‘male’ and 1 did not provide an answer. Excluding this latter participant, we found that women and men displayed the same rate in Task 1, but women were less prone to accept the signed production in Task 2.²¹ In Task 2, the same contrast carried over for *BASE-Grammatical*,²² but not for *BASE-Ungrammatical*.²³

4.8 Discussion

The findings of this experiment indicate that participants judged *QUEX-Statement* items as statements (Task 1), and they deemed such productions acceptable (Task 2). This aligns with our initial hypothesis, according to which the LSC signs that we had identified as quexistentials can be used as indefinite pronouns. The results of Task 1 further confirmed that these signs can be used as interrogative pronouns as well. This shows that these items indeed have the status of quexistentials in LSC.

Overall, this experiment replicated the findings of our elicitation sessions. Task 1’s results strongly indicate that LSC signers interpret sentences containing quexistentials in two ways: as questions (with means 98.09% for the *QUEX-Question* condition) or as statements (with means 95.03% for the *QUEX-Statement* condition). As noted earlier, LSC allows both bare and complex quexistentials. In this experiment, we selected bare forms whenever they were judged as possible productions by our consultants. Hence, syntactic structure and non-manual elements may have been the only cues in which participants could rely on to differentiate between sentence types. We will discuss in more detail the role of NMMs in disambiguating the two quexistential readings in Section 5.1. For now, we note that similar rates were observed in the mean response ‘Statement’ for *BASE-Statement* (92.85%) and ‘Question’ for *BASE-Question* (98.41%).

The responses from Task 2 exhibited more variation, indicating that recognizing sentence types (as in Task 1) may be a relatively easier task compared to judging the acceptability of a production. As already explained, we did not find significant variation with respect to the age of the participants or the age of acquisition of LSC. However, we did notice certain variation among participants with respect to the acceptability of *QUEX-Statement* items in Task 2, with acceptance rates ranging

20 For Task 1, (M = 92.7%, 95% CI[89.5, 95.0]) vs. (M = 98.7%, 95% CI[96.6, 99.5]) for ‘0-3’ and ‘10-18’.

For Task 2, (M = 85.5%, 95% CI[81.4, 88.8]) vs. (M = 90.6%, 95% CI[86.8, 93.4]) for ‘0-3’ and ‘10-18’.

21 For Task 1, (M = 95.1%, 95% CI[92.9, 96.6]) vs. (M = 95.2%, 95% CI[92.7, 96.9]) for ‘male’ and ‘female’.

For Task 2, (M = 86.4%, 95% CI[83.2, 89.1]) vs. (M = 89.9%, 95% CI[86.6, 92.4]) for ‘male’ and ‘female’.

22 (M = 88.0%, 95% CI[82.6, 92.0]) vs. (M = 92.4%, 95% CI[86.8, 95.7]) for ‘male’ and ‘female’.

23 (M = 14.2%, 95% CI[11.0, 18.3]) vs. (M = 13.7%, 95% CI[10.1, 18.3]) for ‘male’ and ‘female’.

from 56.5% to 100%. The cause of this variation is not immediately clear, as it is uncertain whether it is related to some aspect of the sentence unrelated to quexistentials or other sociolinguistic factors, such as the specific school or the deaf club the participants attend. Indeed, one of our consultants suggested that deaf clubs could be a potential source of variation, noting that not all LSC signers use indefinite quexistentials in the person category. In fact, the highest proportion of ‘thumbs down’ responses for *QUEX-Statement* items was observed for the person and quantity semantic categories.

Taken together, the results of this experiment indicate that sentences containing indefinite quexistentials are uniformly interpreted as statements and that they are widely considered acceptable in LSC. Crucially, while the results obtained experimentally displayed some variation, they did not differ significantly from the results gathered through elicitation with a restricted number of consultants. This suggests that the findings from the previous elicitation sessions align with the experimental data, further supporting the robustness and reliability of our conclusions.

5 General discussion

The findings presented in this paper provide compelling evidence that the connection between indefinite and interrogative words extends beyond spoken languages. In particular, in LSC, both bare and complex forms are possible. In this section, we discuss two remaining issues concerning each of these forms.

In Section 5.1, we explore the strategies used in LSC to distinguish existential and interrogative uses of bare quexistentials and discuss the pertinence of the label ‘bare quexistentials’ in the light of LSC data. In Section 5.2, we turn to complex forms and discuss whether LSC conforms with Haspelmath’s universal, according to which indefinites are more marked than and derived from interrogative pronouns.

5.1 Disambiguation of bare quexistentials

As discussed in Sections 2 and 3, indefinite and interrogative pronouns may be formally identical. We labelled such forms bare quexistentials. However, considering the presence of both manual and non-manual elements in SLs, we raised the question of whether bare quexistentials could indeed be found in any SL.

Across spoken languages, disambiguation of bare forms is known to be achieved by syntactic or prosodic means, such as intonation and stress (Haspelmath 1997; Haida 2008; Hengeveld et al. 2022). In Section 3.2.3, we noted that quexistential indefinites in LSC are not restricted in terms of their position in the clause, but they do need to occur in the scope of certain licensors (e.g., polar questions and

some modals). Additionally, in each of the two readings, they may occur with different sets of NMMs. Non-manuals serve different functions in SLs (Pfau & Quer 2010). For instance, they play a role in distinguishing sentence types (e.g., questions vs. declaratives) (Zeshan 2004; Cecchetto 2012) and they are considered a suprasegmental feature akin to intonation in spoken languages, as they are superimposed on and can extend over strings of signs of different lengths (Sandler 1999; Zeshan 2006a).

In LSC, the non-manual elements that co-occur with content questions are furrowed brows, forward head tilt, body leans and raised chin (Alba 2016). In our data, content questions were consistently marked by at least one of these markers, most typically furrowed brows. On the other hand, NMMs co-occurring with non-specific indefinites in LSC consist of pulling the corners of the mouth down, sucking the cheeks in and, sometimes, a shrug (Barberà & Quer 2013; Barberà 2015). In our data, the most common NMMs observed in indefinite contexts were corners of the mouth down and furrowed brows. However, neither of them was mandatory (see Section 3.2.4). This suggests that, as it has been claimed for other SLs such as FinSL (see Savolainen (2006) and Section 2.2.1), the absence of NMMs associated with content questions leads to an existential interpretation of the quexistential. Typically, the scope of the NMMs co-occurring with indefinite and interrogative readings of quexistentials was not restricted to the quexistential sign. Therefore, we did not consider them as lexical markers of question words or indefinites (cf. Section 3.2.4).

As discussed in Section 3, non-manual elements other than mouthing are used to identify questions and mark the degree of knowledge the signer has about the referent. Mouthing, however, was the only non-manual strategy taking scope over the quexistential only, irrespective of whether the sign was morphologically simple or complex. Crucially, the mouthing component always aligned with the intended interpretation, using *quién* ‘who’ for the interrogative reading and *alguien* ‘someone’ for the existential one.

In the SL literature, the status of mouthing is controversial. Some researchers argue that the mouthing component is an instance of code-mixing or borrowing; while others propose that some mouthings have become integrated into the phonology of signs (Sutton-Spence et al. 2001). Two arguments in favor of the integration of mouthing in SLs are i) its potential role in disambiguating homonyms, thus serving a distinctive phonological function (van de Sande & Crasborn 2009) and ii) its ability to spread over adjacent signs to mark prosodic constituency.

In our data, mouthing occurred commonly in interrogative and indefinite uses of quexistentials. However, it remains unclear if mouthing it is mandatory (i.e., lexically specified) in quexistential signs. As mentioned in Section 2.1.2, question words are always focus-marked (van Valin 1993; Haida 2008). In SLs, focused

constituents are stressed using manual prosodic cues, such as faster movements and a longer duration of the sign than observed in non-focused constituents (Wilbur 1999; Crasborn & van der Kooij 2013; Kimmelman & Pfau 2016). The same strategies have been described for LSC (Navarrete-González 2019, 2022). Additionally, focus may be marked syntactically by placing the item in final position and non-manually by raised brows and mouth actions (both mouthing and mouth gestures). As noted in Section 3.2.3, interrogative signs tend to appear clause-finally in LSC, which is the position where stress is most prominent (Wilbur 1997; Navarrete-González 2022). It is therefore not surprising that question signs in our data always co-occur with the corresponding voiceless Spanish or Catalan word,²⁴ as mouthing is one of the prototypical strategies to indicate focus and the most systematic non-manual marker of focus in LSC (Navarrete-González 2019). That said, it is relevant to note that in LSC not only interrogative, but also indefinite uses of quexistentials were often accompanied by mouthings.

To determine whether mouthing should be considered in the phonological description of indefinite and interrogative quexistentials, it would be valuable to analyze a more diverse data set, particularly one that includes spontaneous data, as well as more detailed data pertaining to interrogative uses, which were not the main focus of this study.²⁵ Our research does not provide a definite answer regarding the exact role of mouthing. While LSC uses strategies to disambiguate bare forms that are similar to the ones described for spoken languages (e.g., intonation and stress, which in LSC correspond, at least partially, to the use of NMMs), mouthing serves as an additional disambiguation mechanism which has no direct parallel in spoken languages. In this respect, one could argue either for restricting the term ‘bare quexistential’ to forms without disambiguating mouthing, or for extending the term to encompass forms accompanied by mouthing, which is a modality-specific feature of SLs. We leave the issue unresolved for now, noting that it would be informative to identify cases cross-linguistically where mouthing consistently corresponds to either the interrogative or to the indefinite uses. This could also provide clues about the potential derivation of quexistentials from either indefinite or interrogative pronouns, a topic we address in the next section.

24 The interrogative sign WHAT may either occur with the mouthing *qué* (‘what’) or with the non-manuals stretched lips or upper lip raised on one side and nose wrinkling.

25 For some SLs, it has been shown that the frequency of mouthing is influenced by factors such as discourse genre. For example, for BSL, mouthing was found to be more frequent with the informative register compared to the narrative one (Sutton-Spence et al. 2001).

5.2 Asymmetric markedness relation

Typological research has observed that, whenever indefinite and interrogative pronouns are morphologically similar but not fully identical, the indefinite is always the more complex member of the pair (Moravcsik 1969; Haspelmath 1997). Building upon this observation, Haspelmath (1997) proposed a universal asymmetric markedness relation in the indefinite-interrogative pair, such that interrogative pronouns are virtually never more marked (i.e., morphologically complex) than indefinite pronouns nor derived from them. However, in SLs some interrogative words might constitute derived forms. The most salient example is found in SLs where a sign with the same handshape and orientation of the numeral ONE can be used as both an indefinite and a question word in the person category, as in the case of BSL (Cormier 2012) and NZSL (McKee 2006).

Research on spoken languages has noted that interrogative pronouns constitute one of the slowest-changing categories in any language and they prove resistant to etymological analysis (Haspelmath 1997). According to Onea (2021), this makes them ideal candidates to be primitives in the derivational line. However, in his typology of interrogative pronominals, Idiatov (2007) relativizes Haspelmath's claim showing that in some linguistic groups, including the Arawakan and Mayan languages, interrogatives are among the fastest-changing elements. In fact, he shows that languages may both lose oppositions between semantic categories and acquire them and that “[i]n many cases, it has proved possible to trace the origins of the lack of differentiation between ‘who?’ and ‘what?’ in a given language” (Idiatov 2007: 574).

In SLs, the lack of documentation of earlier phases of most languages makes it difficult to determine the evolutionary path of indefinites and interrogative words. On the other hand, the relatively young age of many SLs and their high degree of iconicity makes it easier to trace the origin of some signs. To give an example, the origin of question words is clear in those languages in which generic interrogative signs combine with nouns expressing the semantic category, such as PLACE to express ‘where’, like it occurs in IPSL (Zeshan 2003, 2006c), Hong Kong Sign Language (HKSL) (Tang 2006) and Chinese Sign Language (CLS) (Lin 2019). These examples demonstrate that the claim that question words are resistant to etymological analysis might not be applicable to all SLs and that, in some languages, question words might be morphologically complex expressions.

Furthermore, there is evidence suggesting that, in some languages, certain question words might be of recent development. For example, our LSC consultants recalled that the use of the interrogative sign currently specialized for the meaning ‘where’ covered the categories determiner, person and location (‘which’, ‘who’ and ‘where’) in the past. A similar situation has been described for NZSL interrogative

signs (McKee 2006). This language has two series of question words. The oldest series contains a generic sign that covers, at least, the meanings ‘what’, ‘where’, ‘when’ and ‘why’. The new paradigm, which was developed later and influenced by Signed English, introduced different signs for each category. Interestingly, there are signs with interrogative and existential uses in both series.

Moreover, in a number of SLs, the form of some interrogative signs may coincide with that of non-interrogative signs. In LSC, the manual forms used in the time category matches the articulation of the markers of past and future. Similarly, the forms used in the categories quantity and reason coincide with the nouns NUMBER and REASON. When these signs are used in interrogative contexts, they are produced with the NMMs of content questions to convey the meaning ‘when?’, ‘why/for what reason?’ and ‘how much/many?’. It could therefore be argued that the interrogative sign is dropped and only the nominal/temporal marker is articulated. In fact, this strategy is used in other questions such as ‘What time is it?’ or ‘How old are you?’, which are typically produced without a question word (TIME?, IX₂ AGE?).

However, there are grounds to consider that not all the quexistentials considered in this investigation behave alike. As discussed throughout Section 3, the sign REASON behaves differently from other quexistentials in that, when used existentially, it almost always needs to combine with other manual signs. This suggests that, unlike other quexistentials, for the existential interpretation to arise, it has to combine with other signs that express the indefinite reading. Additionally, except for REASON, which always co-occurs with the voiceless Spanish or Catalan word for ‘reason’ (e.g. *motivo/motiu*), all other quexistentials in our data differ in the mouthing component in the two readings. All in all, this suggests that the sign REASON behaves like a nominal. Additional evidence in this direction is provided by the fact that REASON, but not WHY, can combine with numerals (IX₁ REASON 3: ‘I have three reasons’). The difference between the quexistentials of the category reason and the categories quantity and time may simply lie in the degree of grammaticalization of the interrogative use.²⁶

Taking these observations into account, it remains unclear whether question words in SLs, and particularly in LSC, should be considered primitive categories, or whether the indefinite is always the derived element of the indefinite-interrogative pair. As it has been shown for some spoken languages (Idiatov 2007), the claim that interrogative words are slow-changing elements which prove resistant to etymological analysis does not necessarily apply to SLs. Moreover, it seems possible that

²⁶ Grammaticalization of question words from generic nouns or the numeral ‘one’ is a phenomenon attested in spoken languages, but it is extremely uncommon (Haspelmath 1997). In Italian, for example, the neuter interrogative *che* ‘what’ has been reinforced by *cosa* ‘thing’, with the resulting *che cosa* being reduced to *cosa* (Lehmann 2015: 53).

interrogative words could also originate from nominals or the numeral one. Therefore, while our research does not provide evidence against the claim that indefinites are, as a rule, derived forms,²⁷ it does challenge the idea that interrogatives are always primitive, non-derived and morphologically simpler categories. Overall, the data discussed in this paper adds a new perspective to the indefinite-interrogative affinity, showing that, regardless of the direction of the derivation, the connection between indefinites and interrogatives is so deeply rooted that it spreads across languages and modalities.

6 Conclusion

In this paper, we demonstrated that the indefinite-interrogative affinity is attested in the signed modality. We gathered our data through elicitation and experimentally, with similar results irrespective of the method used. In our first study, which was presented in Section 3, we conducted fieldwork with three LSC language consultants. We described the inventory of LSC indefinites, and identified the semantic categories and the environments that allow quexistential indefinites. Then, we carried out an online experiment with 50 deaf and hard-of-hearing participants. The results of this study, which we reported in Section 4, confirmed that LSC has quexistentials, as participants interpreted sentences with quexistentials as statements and considered such productions acceptable.

While we have identified regularities in the use of quexistentials in LSC, our study also indicates that LSC may encompass different categories of quexistentials. The sign of the person category is the only one with uses restricted to indefinite and interrogative functions. In contrast, the forms of the time, reason and quantity categories have uses beyond the interrogative and the existential (e.g., the signs of the time category are general markers of past and future). Within this later group, we have identified differences with respect to the licensing of bare quexistentials and the mouthing component that co-occurs with them. Future research should investigate whether similar distinctions are present in other SLs.

Overall, the results of our investigation show that LSC behaves similarly to some spoken languages that have quexistentials. However, this study does not fully support Haspelmath's universal, according to which indefinites are more complex than interrogatives and derived from them. To better understand the nature of the indefinite-interrogative affinity in SLs and evaluate the validity of Haspelmath's universal for those SLs in which indefinite and interrogative pronouns are formally related, we need more detailed data from other SLs. The next step of our research

²⁷ We did not find any quexistential in LSC undergoing phonological modifications (e.g., reduplication or incorporation of a tremoring movement) in one of the two quexistential uses, but complex quexistentials were common and, often, the preferred alternative.

is therefore to collect comparable data from a diverse sample of SLs.

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Appendices

A Stimuli

List of stimuli divided by task, condition, context and semantic category. ‘-’ indicates that the distinction does not apply.

Task	Condition	Context	Semantic category	Sentence
1/2	<i>QUEX-St.</i>	Conditional	Person	QUEX.prs WANT PARTICIPATE, MUST BEFORE REGISTER. ‘If someone wants to participate, they must register beforehand.’
1/2			Person	IX ₁ LET-KNOW TRAIN PUNCTUAL, ^{cd} QUEX.prs _{cd} COME LATE, NO-TURNING-BACK. ‘The train will depart on time; if anyone arrives late, there will be no turning back.’
1/2			Quantity	WATER SEA DIVE SEE QUEX.quant LET-KNOW ₁ . ‘If you see someone while diving, let me know.’
1/2			Quantity	IX BUILDING NIGHT, ^{cd} QUEX.quant CL: ‘person _{cd} moving’ THERE-IS, LET-KNOW ₁ . ‘If you see anyone in this building at night, let me know.’
1/2			Reason	^{bf} SOME QUEX.ISN ANSWER DISAGREE, IX ₂ LET-KNOW ₃ _{bf} PROTEST. ‘If for any reason you disagree with the answer, protest.’
1/2			Reason	SOME QUEX.ISN LATE COME, MUST LET-KNOW ₃ . ‘If you’re going to be late for any reason, you must notify him.’
1/2			Time-fut.	QUEX.fut PROBLEM ARISE, LET-KNOW ₁ . ‘If you ever have a problem, let me know.’
1/2			Time-fut.	QUEX.fut NUMBER PASSWORD FORGET, BANK GO MUST. ‘If you ever forget the password, you’ll have to go to the bank.’
1/2		Deontic □	Person	DAY TOUCH SURGERY, MUST QUEX.prs AID. ‘On the day of the surgery, someone must accompany you.’




1/2		Person	MUST QUEX.prs FIREMAN CALL ₃ . 'Someone should call the firemen.'
1/2		Quantity	TRAFFIC-SIGN-rep IX $\overline{\text{QUEX.quant MUST}}$ ^{bf} $\overline{\text{UPGRADE-rep NEW CL: 'install traffic signs'-rep.}}$ ^{bf} 'Some traffic signs must be replaced.'
1/2		Quantity	HOUSE, MUST REPAIR-arc $\overline{\text{QUEX.quant}}$ ^{bf} . 'Some repairs need to be done at home.'
1/2		Reason	$\overline{\text{LEAVE, SURE SOME QUEX.rsn.}}$ ^{bf} . 'He surely left for some reason.'
1/2		Reason	$\overline{\text{IX}_3 \text{ LATE SURE SOME QUEX.rsn.}}$ ^{bf} . 'He surely arrived late for some reason.'
1/2		Time-fut.	BUDGET MUST YEAR IX APPROVE $\overline{\text{QUEX.fut.}}$. 'The budget has to be approved sometime this year.'
1/2		Time-fut.	CONSTRUCTION FINISH MUST MONTH IX $\overline{\text{QUEX.fut.}}$. 'The construction work has to finish sometime this month.'
1/2	Deontic ◇	Person	$\overline{\text{IX}_2 \overline{\text{CAN CONTACT}} \text{QUEX.prs}^{\text{cd}} \text{QUEX.quant.}}$ ^{bf} . 'You can talk to anyone.'
1/2		Person	$\overline{\text{IX}_2 \text{ INVITE CAN QUEX.prs}^{\text{cd, bf}} \text{IX-}_{\text{straight}}}$ ^{cd, bf} . 'You can invite anyone.'
1/2		Quantity	$\overline{\text{IX}_2 \text{ TAKE-rep QUEX.quant ANY.}}$ ^{bf} . 'You can take as many as you want.'
1/2		Quantity	$\overline{\text{NO, IX}_2 \text{ CAN CONTACT ANY}^{\text{bf}} \text{QUEX.quant.}}$ ^{bf} . 'No, you can talk to anyone.'
1/2		Reason	$\overline{\text{COURSE DEREGISTER CAN QUEX.rsn ANY.}}$ ^{bf} . 'You can leave the course for any reason.'
1/2		Reason	$\overline{\text{DRUG}^{\text{bf}} \text{PHARMACY REJECT QUEX.rsn ANY CAN.}}$ ^{bf} . 'You can discontinue the treatment for any reason.'
1/2		Time-fut.	$\overline{\text{IX}_2 \text{ PACKAGE BRING CAN QUEX.fut}^{\text{cd, bf}} \text{ANY.}}$ ^{cd, bf} . 'You can bring the package whenever you want.'


1/2		Time-fut.	$\frac{\text{bf}}{\text{cd}}$ IX ₂ CAN COME QU _{EX} .fut^ANY. 'You can come whenever you want.'
1/2	Epistemic □	Person	$\frac{\text{bf}}{\text{bf}}$ SURE QU _{EX} .prs HELP ₁ . 'Someone will help me for sure.'
1/2		Person	$\frac{\text{bf}}{\text{bf}}$ UNIVERSITY, QU _{EX} .prs SIGN-LANGUAGE KNOW MUST. 'Someone has to know LSC in this university.'
1/2		Quantity	$\frac{\text{bf}}{\text{bf}}$ IX BOAT^PORT IX ALL-NIGHT, SURE QU _{EX} .quant CATCH^FISH THERE-IS. 'He has been at the port all night; surely, he has some fish.'
1/2		Quantity	$\frac{\text{bf}}{\text{bf}}$ SURE NEIGHBOR CUP QU _{EX} .quant THERE-IS-rep. 'Surely, my neighbor has some glasses.'
1/2		Reason	$\frac{\text{bf}}{\text{bf}}$ DESK PAPER CL: 'put a pile of documents' SURE SOME QU _{EX} .f _{sn} . 'He left the documents on my desk, surely for some reason.'
1/2		Reason	$\frac{\text{bf}}{\text{bf}}$ PRESIDENT HANDS^RESIGN SURE QU _{EX} .f _{sn} IN- FORM IX ₁ KNOW.NOT. 'Surely, the president resigned for some reason, but I don't know if he has disclosed it.'
1/2		Time-fut.	$\frac{\text{cd}}{\text{cd}}$ QU _{EX} .fut SURE COME. 'He will surely arrive at any moment.'
1/2		Time-fut.	QU _{EX} .fut MIND^TELEPATHY COMMUNICATION SURE. 'Surely one day/soon we will communicate through telepathy.'
1/2	Epistemic ◇	Person	$\frac{\text{cd, bf}}{\text{cd, bf}}$ IX ₁ SEEM QU _{EX} .prs OUTSIDE IX. 'There seems to be someone outside.'
1/2		Person	$\frac{\text{cd, bf}}{\text{cd, bf}}$ VIBRATION, QU _{EX} .prs CAN COME. 'I feel a vibration, it's possible that someone is coming.'
1/2		Quantity	TOPIC FILM HORROR, SON SEE FORBIDDEN, BUT IX ₁ THINK IX ₃ QU _{EX} .quant SEE ALREADY.

			'My son is forbidden from watching horror movies, but I think he has already seen some.'
1/2	Quantity		DEMONSTRATION MANY-PEOPLE PERSON-rep ^{cd} FRIEND SEE THERE-IS.NOT.-circ, CAN QUEX.quant ^{cd} THERE-IS-rep. 'At the protest, there were lots of people, and I didn't see my friends, but some of them might have been there.'
1/2	Reason		^{cd, bf} 3ASK ₁ -rep CAN SOME QUEX.rsn. 'He might insist on asking for some reason.'
1/2	Reason		ROOM ^ OFFICE BOSS ^{cd} 3CALL ₃ CAN SOME QUEX.rsn. 'They might have called her to the boss's office for some reason.'
1/2	Time-fut.		^{cd} COVID QUEX.fut DISAPPEAR CAN. 'COVID may disappear some day.'
1/2	Time-fut.		^{cd} CAN QUEX.fut COME. 'He may arrive anytime.'
1/2	Episodic	Person	^{cd} QUEX.prs CL: 'person approaching' GREET, ^{cd, bf} IX ₁ KNOW.NOT. 'Someone I don't know greeted me on the street.'
1/2		Person	^{cd, bf} YESTERDAY SUBWAY QUEX.prs 3SEE ₁ -rep. 'Yesterday, someone was looking at me repeatedly on the subway.'
1/2		Quantity	IX ₁ UNTIL-NOW ACCIDENT NEVER g: 'knock-on- ^{cd, bf} wood', IX ₃ QUEX.quant ACCIDENT++. 'So far, I have never had an accident, but he has already had some.'
1/2		Quantity	^{bf} ^{cd} MAN ^ KID SEE QUEX.quant. 'The child saw some.PL.'
1/2		Reason	THE-TWO DIVORCE SOME QUEX.rsn, IX ₁ NO-IDEA. 'They have divorced for some reason, but I don't know (why).'

1/2			Reason	GROUP POLITICAL, ^{cd} <u>SOME QUEX.ISN</u> SUPPORT CL: 'people following something'-rep. 'For some reason, that political group has increased its support.'
1	<i>QUEX-Qu.</i>	Content-Q	Person	^{bf, cu} <u>YESTERDAY GAME WIN QUEX.prs</u> 'Who won the game yesterday?'
1			Quantity	<u>IX₂ GO COUNTRY-rep DIFFERENT-rep</u> ^{bf} <u>TOUCH-rep QUEX.quant</u> 'How many countries have you been to?'
1			Reason	^{bf, cd} <u>PRESIDENT RESIGN QUEX.ISN</u> 'Why has the president resigned?'
1			Time-fut.	^{bf} <u>PARLIAMENT EUROPE, ELECTIONS QUEX.fut</u> 'When will there be elections to the European Parliament?'
1			Time.past	^{bf} <u>LAW LANGUAGE SIGN-LANGUAGE CATALAN LSC</u> <u>APPROVE QUEX.past</u> 'When was the LSC law approved?'
1			Time.past	^{bf} <u>IX₂ RETIRE QUEX.past</u> 'When did you retire?'
1	<i>BASE-Qu.</i>	Content-Q	Location	^{bf} <u>KEY KEEP WHERE</u> 'Where do you keep the keys?'
1			Location	^{bf} <u>PAST IX₂ GO VACATION WHERE</u> 'Where have you gone on vacation?'
1			Reason	^{cd, bf} <u>MOTORBIKE LEND CL: 'lend a motorbike'</u> <u>NO, WHY</u> 'Why won't you lend me the motorcycle?'
1			Reason	^{bf} <u>IX₂ TALK-SECRETLY WHY</u> 'Why are you talking in secret?'
1			Manner	<u>CAR WHEEL CHANGE CL: 'remove and place a wheel'</u> ^{bf} <u>HOW</u> 'How do you change a car tire?'
1			Manner	^{bf} <u>IX₂ WORK COME HOW</u> 'How do you come to work?'

1		Thing	$\overline{\text{IX}_2 \text{ WORK WHAT}}^{\text{bf}}$ 'What do you do for a living?'
1		Thing	$\text{YESTERDAY FOOD}^{\wedge} \text{NIGHT} \overline{\text{WHAT}}^{\text{bf}}$ 'What did you have for dinner last night?'
1		Determiner	$\text{IX}_2 \text{ PAST} \overline{\text{LITTLE}}^{\text{cu}} \text{ THINK FUTURE WORK}$ $\overline{\text{WANT WHICH}}^{\text{bf}}$ 'When you were little, what did you want to be when you grew up?'
1		Determiner	$\text{IX}_2 \text{ FILM LIKE MORE WHICH}^{\text{bf}}$ 'Which movie do you like the most?'
1	Altern.-Q	–	$\text{IX}_2 \text{ EAT} [\text{HERE}]_{\text{ipsi}} [\text{HOUSE}]_{\text{contra}} \overline{\text{WHICH}}^{\text{bf}}$ 'Do you eat here or at home?'
1		–	$\text{IX}_2 \text{ LIKE MORE} [\text{MEAT}]_{\text{contra}} [\text{FISH}]_{\text{ipsi}}$ 'Do you prefer meat or fish?'
1		–	$\overline{\text{IX}_2 \text{ WANT} [\text{BEER}]_{\text{contra}} [\text{WINE}]_{\text{ipsi}} \overline{\text{IX-IX}}}$ 'Do you want beer or wine?'
1		–	$\text{IX}_2 [\text{WORK}]_{\text{contra}} [\text{STUDY}]_{\text{ipsi}} \overline{\text{WHICH-OF-TWO}}$ 'Do you work or study?'
1		–	$\overline{\text{IX}_2 \text{ WANT WHICH}}^{\text{bf}}$ 'Which of the two do you want?'
1	Polar-Q	–	$\text{IX}_2 \text{ WORK} \overline{\text{LIKE}}^{\text{bf}}$ 'Do you like your work?'
1		–	$\text{IX}_2 \text{ MUSEUM PICASSO GO} \overline{\text{ALREADY}}^{\text{bf}}$ 'Have you been to the Picasso Museum?'
1		–	$\overline{\text{SEE SOME}}^{\text{bf}}$ 'Do you see something?'
1		–	$\text{LIBRARY WEEKEND OPEN} \overline{\text{YES-NO}}^{\text{bf}}$ 'Is the library open on weekends?'
1		–	$\overline{\text{IX STREET CAR CL: 'park a car' CAN YES-NO}}^{\text{bf, fb}}$

1		–		‘Is it possible to park on this street?’ ORGAN-rep DONATION ^{bf, fb} IX ₂ IN-FAVOR YES-NO ‘Are you in favor of organ donation?’
1	<i>Filler</i>	Epist. ◇	Person	^{cd} SEEM IX ONE PERSON CL: ‘pass’. ‘It seems that someone is passing by.’
1		Epistemic □	Time-fut.	^{cd} IX ₁ THINK SURE DAY^ONE AIDS CURE DISAPPEAR. ‘Surely, one day a cure for AIDS will be found.’
1		Epistemic ◇	Thing	^{cd} CAR WORK-NOT, SOME IX CAN BROKEN . ‘The car is not working; it may have something broken.’
1		Deontic ◇	Manner	^{cd} TOUCH EXAM FORM [WRITE] _{contra} [SIGN] _{ipsi} ^{cd} WANT^ANY-  ‘You can respond to the exam in any way: in writing or in SL.’
2	<i>BASE-Gr.</i>	Conditional	Person	IF ONE^PERSON COME, RESPONSIBLE TAKE-CARE IX ₁ . ‘If someone comes, I’ll take care of it.’
2			Thing	IX ₂ SOME KNOW, BETTER KEEP-SECRET. ‘If you find out something, keep it to yourself.’
2			Time-fut.	^{cd} IF DAY^ONE IX ₃ BARCELONA COME, IX ₁ EAT 3INVITE ₁ . ‘If he ever comes to Barcelona, I’ll invite him for a meal.’
2		Modal	Person	^{bf} MUST ONE^PERSON DIRTY MESS CLEAN^CLEAR. ‘There must be someone in charge of cleaning up.’
2			Thing	^{bf, cd} IX _{3a-circ} STEAL IX _{3b} bSEE _a NOTHING-  ^{bf} IMPOSSIBLE SURE SOME SEE LOOK-THE-OTHER-WAY. ‘He says que didn’t see the robbery, but that’s impossible, he must have seen something.’
2			Time-fut.	^{cd, bf} IX ₂ CAN COME ANY-  , BUT TIME 8 AFTER. ‘You can come anytime, but after 8.’
2		Episodic	Person	YESTERDAY PERSON WALLET STEAL ₁ . ‘Yesterday, someone stole my wallet.’

2		Thing	WOMAN^KID DISCOVER ^{bf} SOME. 'The girl discovered something.'
2	<i>BASE-Ungr.</i>	—	IX ₁ CLASS^ROOM TOTAL 57 MAN^KID. 'In my class, there are 57 kid in total.'
2	—	—	IX ₁ BANK GO, ALSO PIDGEON. 'I go to the bank, also pidgeon.'
2	—	—	IX ₁ TIME FREE, BUT PEDRO WORK LOADS-OF-WORK IX ₁ -  . 'I (have) free time, but Pedro has a lot of work I.'
2	—	—	IX ₁ TODAY MEETING PERSON-PERSON 3. 'Today I had a meeting with 3 people-DU.'
2	—	—	CONCER PUBLIC CL: 'go many people' FEW. 'The concert was attended massively by a few people.'
2	—	—	FATHER^MOTHER ₃ VISIT ₁ WANT-NOT, IX ₁ ALSO. 'My parents don't want to visit me and me too.'
2	—	—	LAST-YEAR DOG NEXT-YEAR. 'Last year dog next year.'
2	—	—	PRESIDENT INFORM^DISCOURSE ALREADY, IX ₁ NEITHER. 'The president has already given his speech and me neither.'
2	—	—	IF IX ₂ HOUSE STAY, IX ₁ EITHER. 'If you stay home, me neither.'
2	—	—	PEDRO COOK FAST, ALSO SOUP. 'Pedro cooks quickly and also soup.'
2	—	—	PARK^SPACE DOG ONE NO-MORE CL: 'two animals chasing each other.' 'There was only one dog in the park and two dogs were chasing each other.'
2	—	—	CONTACT PERSON-PERSON 5. 'I contacted five person-DU.'
2	—	—	IX ₁ HOLIDAYS ALREADY, MARÍA NEITHER. 'I have already had vacations and María neither.'
2	—	—	HOUSE-HOUSE-HOUSE-HOUSE 2. '(I have) house house house house 2.'
2	—	—	IX ₁ HAPPY, BUT IX ₃ SAD IX ₁ . 'I am happy, but he is sad I.'