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D 2.3. Description of French Sign Language Phenomena

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History of changes

VERSION	DATE	CHANGE	REVIEWER(S)
1.0	23.10.2017	Initial version. Draft of the structure, preliminary sample of the section on word order and content interrogatives.	
1.1	1.11.2017	Comments from WP2.1 leader Meltem Kelepir on V1.0.	Meltem Kelepir
2.0	1.11.2017	Incorporation of comments on V1.1. New structure for the sections on linguistic phenomena and litmus constructions. The following subsections have been added: goals as coming from WP2.3, methodology for each specific research topic and more detailed explanation of results including relevant examples. Part on dissemination has been removed (to be forwarded to WP4).	
3.0	19.11.2017	Typos and first draft of RC, agreement and wh-cleft.	
3.1	22.11.2017	Comments from Meltem Kelepir.	Meltem Kelepir
4.0	22.11.2017	Incorporation of Meltem Kelepir's comments on v. 3.1. Draft of role shift added.	
5.0	24.11.207	First complete draft with conclusions and references.	
5.1	25.11.2017	Typo corrections and minor changes in the role shift part.	
5.2	27.11.2017	Comments from Jordina Sánchez.	Jordina Sánchez
5.3	28.11.2017	Incorporation of comments from Jordina Sánchez.	
5.4	29.11.2017	Comments from Jordina Sánchez and Josep Quer.	Jordina Sánchez, Josep Quer
5.5	30.11.2017	Incorporation of comments. Final draft.	

INDEX

Scope of the document

The purpose of this document is to describe the work done by the CNRS unit within WP 2.1-Grammars. The subtask assigned to this unit is to provide a theoretically informed description of a list of linguistic phenomena of French Sign Language (LSF). These phenomena have been identified as relevant to conduct WP2.3-Assessment activities, that is, the development of the sign language assessment tools within the SIGN-HUB project. In particular, the team in charge of sign language assessment identified the following as litmus constructions:

- Relative clauses

- Content interrogatives

- Wh-cleft constructions

- Verb agreement system

- Role-shift

These constructions provide sensitive information about particular kinds of syntactic complexity and are expected to be problematic in special populations. The information gathered during the investigation of these phenomena will be used in the creation of various tests related to the assessment of LSF.

1. Introduction

WP2.3 focuses on sign language assessment and identified the following as "litmus constructions":

- Relative clauses

- Content interrogatives

- Wh-cleft constructions

- Verb agreement system

- Role-shift

These constructions provide sensitive information about particular kinds of syntactic complexity and are expected to be problematic in special populations. The information gathered during the investigation of these phenomena will be used in the creation of various tests related to the assessment of LSF. The specific connections with WP2.3 goals are detailed in the dedicated subsections.

Most of the works done on French Sign Language (LSF) have been concerned with the iconic properties of the signed modality and have been developed within an ad-hoc language model designed by pioneering works of Christian Cuxac and further developed in his research group (see Cuxac 2000 for an overview of the model). Unfortunately, very few of these works can be adapted to the purposes of WP2.3 activities, as most have been concerned with the morpho-phonology of iconic constructions and with the descriptive semantics of role shift.

As a matter of fact, with the partial exception of role-shift and to a certain extent verb agreement, none of the topics addressed in the literature satisfies the specific needs of WP2.3, as none of them identifies the morpho-syntactic properties of the following litmus constructions:

- Relative clauses

- Content interrogatives

- Wh-cleft constructions

Some general aspects of the methodology used in this WP task are explained in **Section 2**. In order to provide a reliable description of these litmus phenomena some background work needed to be done as well (**Section 3**). In particular, work on basic sign order and syntactic constructions such as coordination and subordination was necessary. These preliminary works covered the basis upon which the systematic investigation of litmus constructions was built (**Section 4**). The description of each phenomenon is structured in the following way:

- Presentation of the relevant part of the General Checklist of the SignGram Blueprint (Quer et al In press) in which the phenomenon is described

- List of the goals that specifically target WP2.3 requirements

- Subtask specific methodology

- Overview of the results

2. General Methodology

For each phenomenon/construction described here, we adopted the following methodology:

1) The relevant section(s) of the General Checklist of the SignGram Blueprint have been identified.

2) For each of these sections, a state of the art survey has been conducted.

3) Fieldwork has been conducted to:

   • cover the preliminary basis

   • provide empirical description of previously un-described phenomena

   • complete the partial descriptions of verb agreement.

4) Preliminary report of the results to the leader responsible for LSF in WP2.3 task.

5) Fine-grained fieldwork to accommodate the specific needs of WP2.3.

Fieldwork activities have been conducted with standard elicitation techniques as approved by the Ethical committee of the French unit. Elicited data come from native signers of LSF who regularly collaborate with the CNRS unit. Data validation has been done with the playback method (Schlenker 2014).

Dr. Carlo Geraci and Charlotte Hauser have conducted the research within the premises of CNRS. Laurene Loctin, Thomas Leveque and Yohan Marcelino participated as linguistic consultants. They are all native signers of LSF, age range 25-35, Laurene Loctin is from Paris, Thomas Leveque from Bordeaux and Yohan Marcelino from Lyon.

3. Background work on LSF syntax

Preliminary work was needed to cover some basic properties of LSF. These are not part of the litmus constructions/phenomena identified by the team developing sign language assessment (WP2.3). Nonetheless, a proper understanding of the litmus constructions cannot be reached without a preliminary assessment of some basic properties of LSF. Particular attention has been given to word order and syntactic subordination/coordination.

3.1. Word order

The main objective is to identify word order in simple declarative sentences. This provides the baseline to investigate word order variation/constraints in litmus constructions.

3.1.1. Checklist and State of the Art

Word order is treated in Part 5 Syntax, Chapter 2, Section 3 of the SignGram Blueprint. Two papers address word order in LSF:

- Bouvet, D. 1996. Approche polyphonique d'Un recit produit en langue des signes française. *PUL* 29, 29–54.

- Langhe, Olivier De, Pierre Guitteny, Henri Portine & Christian Retoré. 2004. A propos des structures OSV en langue des signes française. *SILEXICALES*, vol. 4, 1–16.

3.1.1. Goals for WP2.3 Sign language assessment

The goals expected for WP2.3 are:

- Establish what is the canonical sign order(s)

    o Out-of-the-blue contexts

    o Non-out-of-the-blue contexts

- Find possible sources for sign order variation

    o Verb type (i.e. agreeing vs. non-agreeing verbs)

    o Animacy of the argument

3.1.2. Methodology

Elicitation of various word orders was done in the following way:

- The informant is shown a verb from an on-line LSF dictionary. The following sources have been consulted: Elix (https://www.elix-lsf.fr/?lang=fr), Spread the Sign (www.spreadthesign.com), LSF DICO (http://www.lsfdico-injsmetz.fr/) and Sematos (http://www.sematos.eu/).

- S/he is asked to produce an utterance using that sign or the variant of her/his idiolect in case it is different from the one found in the dictionary.

- If the utterance contains more elements than just a predicate and its arguments, the informant is asked to produce the utterance by removing each non-argument sign one at a time. This procedure reproduces the step-down method typical of quantitative sociolinguistic analyses (Tagliamonte 2006).

- Once an utterance containing a predicate plus its argument(s) is obtained, the informant is asked to produce various permutations of sign orders (these utterances are recorded).

- By predicate and argument replacement, data of various verb types and argument have been collected.

- Using the playback method the video utterances are evaluated with accept-ability and felicity judgments with respect to various contexts (Schlenker 2014). Judgments are normally collected after a break or on separate days.

- Cross-validation is done by letting informants provide judgments on each oth-er's productions.

- Starting from a basic sentence with predicate plus arguments, additional ele-ments are added (e.g. temporal adverbs, locative phrases etc.). This proce-dure reproduces the step-up method typical of quantitative sociolinguistic analyses (Tagliamonte 2006).

- Videos from the step-up procedure are then cross-validated for acceptability and felicity.

3.1.3. Overview of results

- **Canonical word order**. Fieldwork data confirmed Bouvet's (1996) research that SVO is the most natural order (contra Langhe et al. 2004).

- **Non-canonical orders**. Other orders are also possible as long as adequate non-manual markers (NMMs) are used (e.g. raised eyebrows to mark topicalized constituents or squinted eyes to mark constituents in focus). Non-canonical or-ders are also found when classifier signs are used. Word order is more flexible in non-out-of-the-blue contexts (i.e. when there is a shared linguistic or extra-linguistic context).

- **Noun Noun Verb sequences**. Without prosodic (NMM) or morphological (classifi-er) cues Noun Noun Verb constructions are interpreted as coordinated subject constructions with an implicit object.

- **Localization of event participants**. Spatial localization of the arguments helps in-terpretation of the syntactic role in the case of non-agreeing verbs.

- **Animacy**. In the case of transitive verbs with animate and inanimate arguments, the animate arguments tend to be interpreted as the agent/subject of the event. An inanimate subject and animate object in out-of-the-blue contexts generate slightly degraded acceptability.

3.2. Coordination & subordination

The main objective is to describe how coordinated structures and sentential complements are conveyed in LSF.

3.2.1. Checklist and State of the Art

Coordination and Subordination are treated in Part 5 Syntax, Chapter 3.

- No previous work has been conducted on this topic before.
- On embedding classifier constructions within complex constructions: Cuxac, Christian. 2000. *La langue des Signes Française (LSF) Les voies de l'iconicité*. Ophrys.

3.2.2. Goals for WP2.3

The goal expected for WP2.3 is to:

- Find cues that help distinguishing utterance/sentence stacking from syntactically more complex structures like coordinated and embedded structures.
- Provide the baseline to investigate relative clauses, long distance content questions (e.g. *what did you say John ate for dinner?*) and wh-cleft constructions (e.g. *what you are eating is French food*).
- Investigate potential word order restrictions in the case of sentential complements.

3.2.3. Methodology

Sentential complements have been elicited with an "augmentative strategy":

- The informant is shown a simple declarative sentence (e.g. JEAN EAT PASTA).
- S/he is asked to repeat it.
- Then s/he is asked to add to that sentence the sign for a verb of saying and produce a new sentence (e.g. IX-2 SAY JEAN EAT PASTA).
- The verb of saying is then replaced with other complement taking predicates like REGRET, THINK, HOPE, SURE, etc. (Noonan 2007).
- Object drop in out-of-the-blue contexts is used as a diagnostic for embedding of the complement clause (e.g. * *John said* vs. *John said that Mary is late*).
- Matrix content interrogative with an embedded wh-phrase (e.g. *What do you think Peter ate?*).
- Acceptability and felicity judgments are collected and cross-validated as in Section 3.1.2.

Coordinate structures have been elicited in a similar manner:

- The informant is shown a simple declarative sentence (e.g. JEAN EAT PASTA).
- S/he is asked to repeat it.
- S/he is asked to add the phrase "DRINK WINE" in order to create a coordinated VP structure.
- Then s/he is asked to add a different agent/subject for the second event so that two coordinated CPs are created (e.g. JEAN EAT PASTA PIERRE DRINK WINE) .
- As a baseline, the informant is also asked to produce the sentences as describing two separate and unrelated events.

- Movement across the board is used as a diagnostic for coordination (e.g. *what did John buy and Peter read?* vs. * *what did John buy and Peter read a book?*).

- Acceptability and felicity judgments are collected and cross-validated as in Section 3.1.2.

3.2.4. Overview of the results

- **Standard coordination** is not overtly marked by the use of an overt sign corresponding to the English connective "*and*". Rather, the two sentences are normally stacked one after the other as if they where juxtaposed sentences.

  [JEAN HELP DAMIAN] [IX-3 PIERRE HELP MARIE]

  'Jean helped Damian and Pierre helped Marie'

- Another common way to mark coordination is by using space. In those cases, the first conjunct is produced on one side of the signing space, and the second conjunct is produced on the opposite side. This strategy is particularly relevant in cases where the two conjuncts also vehicle some sort of contrast.

  [JEAN HELP DAMIAN]ipsilateral [IX-3contralateral PIERRE HELP MARIE]contralateral

  'Jean helped Damian and Pierre helped Marie'

- **Overt markers**. The sign PLUS can be optionally used to coordinate two VPs. In the case of DP coordination, the sign ADD can be used. It remains to be verified the extent to which these strategies can be used also to coordinate two CPs. Adversative coordination is marked by space and overt conjunction BUT.

- **Abstract/token space**. In the case of token space (Liddell 2003), the natural contrast is done on the x-axis and there is a slight preference to have the first conjunct on the ipsilateral side and the second conjunct on the contralateral side. Interestingly, verb directionality is also affected, producing a mirror image effect. This is particularly evident in case of two minimally different conjuncts, as in the example above. Specifically, the verb HELP is directional in LSF and its directionality targets opposite sides in the two conjuncts (see figure below). Controlled experimental data are needed to further investigate these issues. One possible hypothesis is that there could be a phonological constraint requiring maximizing contrast in these cases.

Figure 1: HELP and opposite directionality in coordinated structures

- **Evidence for coordination**. In languages where coordination is not overtly marked with manual connectives, evidence for genuine coordination, rather than simple juxtaposition of two independent sentences can be provided by syntactic diagnostics. The most robust one is across the board extraction. An example from English is the following:

  Scenario: John went to the market and stopped at Mary's stand to buy something.

  A: what did Mary sell ___ and John buy ___?

  B: Apples.

  B: * Mary sold apples and John bought oranges

The content question is built both on the object of the verb *sell* and the verb *buy*. In languages like English, the answer cannot be disjoint, i.e. one single element in the answer must satisfy both gaps in the question.

The **challenge** represented by LSF is that the canonical way of constructing content questions is by leaving the wh-sign in situ. However, this won't allow us to test for across the board questions. However, non-canonical constructions with the wh-sign in clause initial and clause final position can be used instead. The following examples prove that even in the case of sentence stacking, coordination is possible.

  WHO CAT CHASE ___ , DOG PROTECT ___

  CAT CHASE ___ , DOG PROTECT ___ WHO

  'who did the cat chase and the dog protect?'

In the case of spatial displacement of the conjuncts, across the board movement is still possible. However, in this case a disjoint answer is expected answer (unless accidental co-reference). So an appropriate answer to the following example could be "*the cat chased a bird and the dog protected a mouse*".

  WHO [CAT CHASE ___]$_{IPSILATERAL}$, [DOG PROTECT ___]$_{CONTRALATERAL}$

  [CAT CHASE ___]$_{IPSILATERAL}$, [DOG PROTECT ___]$_{CONTROLATERAL}$ WHO

  'who did the cat chase and the dog protect?'

- **Ambiguity: Juxtaposition vs. Coordination**. The presence of across the board wh-questions confirmed the possibility that juxtaposed sentences can be parsed as a coordinated structure, whether or not spatial contrast is used or not. However, for those cases where no positive evidence is offered (i.e. for example in declarative sentences), the alternative parsing of non-coordinated sentences should be possible as well, especially in the case where spatial contrast is absent. In other words, all things being equal, juxtaposed sentences are expected to be always ambiguous between coordinated and non-coordinated constructions. This is proved by the fact that content questions with canonical and non-canonical order can be asked (with some restrictions). The following examples show that in a discourse stretch a (canonical or non-canonical) content question can be followed by a simple declarative sentence.

  WHO CAT CHASE ___ , DOG PROTECT BIRD

  CAT CHASE WHO, DOG PROTECT BIRD

  'who did the cat chase? The dog protected a bird.'

This is typically impossible in the case of genuine coordination, as shown by the English example below:

* Who did the cat chase ___ and the dog protected the bird?

Asymmetric displacement from one conjunct in a coordinated construction is not possible (Ross 1967). The contrast between the LSF pattern where asymmetric extraction seems to be possible and the typical pattern of co-ordination can be explained by the fact that juxtaposed sequences are indeed ambiguous between two syntactic parsings:

- o Two juxtaposed sentences

- o Coordinated structure

- **Independent answers**. One peculiarity of LSF is that in clear cases of across the board extractions, two answers are available:

    - o <u>No contrastive use of space</u>: The answer requires one single element (like in English).

    - o <u>Contrastive use of space</u>: The answer requires two (possibly) different elements.

4. The litmus constructions of LSF

The following constructions have been identified as relevant to evaluate sign language proficiency within WP2.3:

- Relative clauses

- Constituent questions

- Wh-cleft constructions

- Verb agreement system

- Role-shift

These constructions provide sensitive information about particular kinds of syntactic complexity and are expected to be problematic in special populations. The information gathered during the investigation of these phenomena will be used in the creation of various tests related to the assessment of LSF. The specific connections with WP2.3 goals are detailed in dedicated subsections.

4.1. Relative clauses

A relative clause is a clause that modifies a noun, and thus, it has an adjectival function. The noun that is modified is called "the head" of the relative clause (or "head noun"). Depending on the language, any constituent can be relativized, that is, can be the head.

This part of the task has been conducted by Charlotte Hauser and Carlo Geraci.

4.1.1. Checklist and State of the Art

Relative clauses are treated in Part 5 Syntax, Chapter 3.4 of the SignGram Blueprint and in Part 5 Semantics, Chapter 14.3.

<u>Syntax, Chapter 3.4</u>

3.4 Relative clauses

    3.4.1 Type of relative clause

    3.4.2 Presence or absence of a relativization sign

        3.4.2.1 List of relativization signs

         3.4.2.1.1 Human/non-human specificity of the relativization sign

         3.4.2.1.2 Singular/plural specificity of the relativization sign

        3.4.2.2 Position of the relativization sign

        3.4.2.3 Optionality or obligatoriness of the relativization sign

    3.4.3 Position of the noun phrase with the relative clause within the matrixclause

    3.4.4 Subject versus object relativization

    3.4.5 Displacement of noun phrases with relative clauses

    3.4.6 Special non-manual marking

        3.4.6.1 List of non-manual markers

        3.4.6.2 The spreading domain of each non-manual marker

    3.4.7 Restrictive vs non-restrictive relative clauses

Relative clauses have never been investigated before in LSF. However, there is an extensive literature on spoken language and a considerable amount of literature on other

sign languages (SLs) as well. This literature helped us in this part of the task. The relevant references are listed in the SignGram Blueprint. To this we added a recent work done on Israeli SL, which was extremely useful in terms of methodology:

- Dachkovsky, Svetlana. 2016. The development of a RC marker from a deictic gesture in Israeli Sign Language. In: Paper presented at the Workshop "Sign language agreement revisited: new theoretical and experimental perspectives", Konstanz 23/26- Feb. 2016.

4.1.2. Goals for WP2.3

Even though relative clauses (RC) are found in almost all of the world's languages, they are quite complex syntactic constructions and a potential source of a number of processing effects including garden path (e.g. *The horse raced past the barn fell*), asymmetries between subject and object, etc. Special populations are particularly sensitive to these effects. Furthermore, SLs have the additional dimension of space that in principle may facilitate or complicate the processing of RC. The goals of this study are to:

- Provide an accurate description of the relativization strategies
- Identify the main syntactic properties
- Explore the nature of the relative markers (if any)
- Explore the role of space in the construction

4.1.3. Methodology

In the preliminary stage, data have been elicited by adapting tasks commonly used in language acquisition (Adani, Stegenwallner-Schütz, Haendler, & Zukowski 2016, Belletti and Guasti 2015) and successfully adapted to the case of SL by Dachkovsky (2016). Once the baseline was obtained, we also used other more direct strategies. For example, we asked our informants to displace an element of the sentence and to sign it again. The schema we adopted is illustrated in the figure below (to appear in Hauser and Geraci (submitted)).
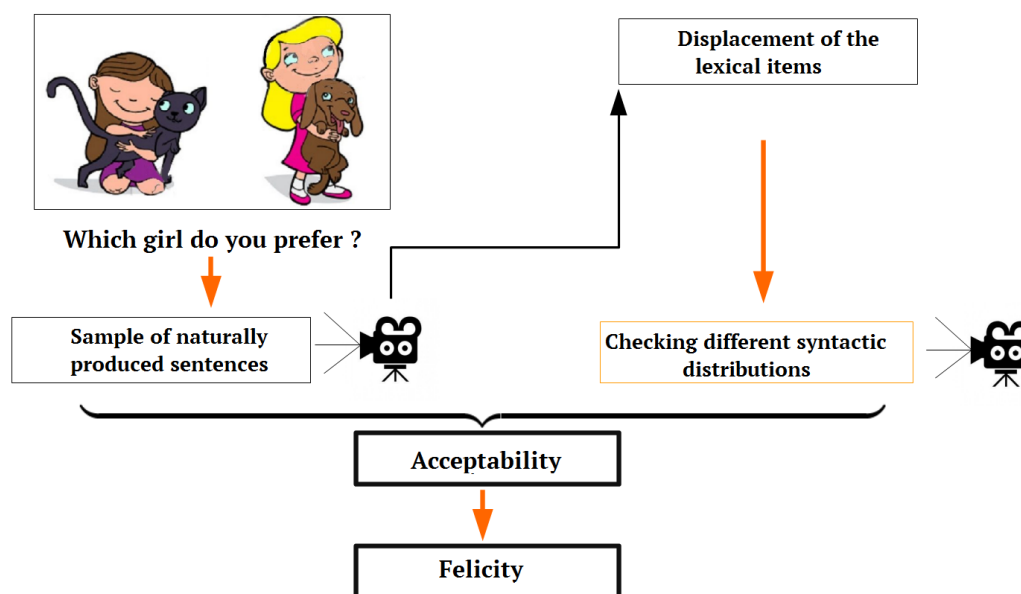

Figure 2: Schema adopted to elicit relative clauses (Hauser and Geraci, submitted)

4.1.4. Overview of the results

- **Strategies**. The most common relativization strategy is via an external head (like in the English type of RC). Within this strategy, relative clauses can be marked either via an overt sign (a pointing-like sign glossed as PI or a person classifier) plus non-manuals (NMM), or via non-manuals only. The non-manuals involve raised eyebrow and body/head turn. The NMMs normally spread over the head and relative marker and sometimes over a larger portion of the relative clause. Examples are given below.

    _____NMM

    I PREFER VET **PI** ___GAP CURE DOG

    _____NMM

    I PREFER VET **PERSON-CL** ___GAP CURE DOG (only for head nouns that denote humans)

    ____NMM

    I PREFER VET CURE DOG

    'I prefer the vet that is curing the dog.'

- **Syntactic variation**. In addition to externally headed relative clauses we found evidence for internally headed relative clauses. A minimal pair is given below.

    _____NMM

    I PREFER DOG **PI** VET CURE ___GAP

    _____NMM

    I PREFER VET CURE DOG **PI**

- **Syntactic function**. RC can be built on any element of the Lehmhan's hierarchy of accessibility: Subject, object, adjunct, etc. (Lehman 1988).

- **Relative marker**. The relative marker PI shares several properties with the typical pointing pronoun found in SL (and in LSF as well):

    o **Phonologically**, it has the same handshape and it has directional movement. It differs from standard pointing pronouns because it also contains a distal handshape change.

    o **Morphologically,** it agrees in space with the head and can be used in declarative sentences to mark focus (Schlenker 2017).

    o **Syntactically**, it is found adjacent to the head noun both in externally and internally headed relative clause.

    These reasons provide strong arguments to claim that PI is a relative pronoun, rather than a relative complementizer (derived from a pronoun).

- **Syntactic status**. The syntactic status of RC is that of a subordinate clause-like element embedded in the main clause via one of its DPs (in the case of externally headed relative clause). Evidence for this comes from the fact that RCs are syntactic islands (Ross 1967). This is shown by the contrast between sentential complements where wh-signs generate a matrix interrogative sentence and RC where wh-signs are unacceptable. The relevant data are provided below.

    * MARIE PREFER   WHO **PI** ___GAP CURE DOG

    Intended: Who is such that Marie prefers her/him and s/he is curing the dog?'

MARIE SAY VET CURE WHO

'Who did Marie say is curing the dog?'

Furthermore, they can be recursively embedded:

MAN FORK-FORM STAB PI DOG [CHASE CAT [PI BIRD CATCH]]

'The man stabbed the dog that chased the cat that catched the bird.'

- **Use of space**. Beside standard uses of space (either token or blended), the RC makes use of spatial agreement of the relative pronoun PI. PI is used to univocally select the head of the relative clause in cases where relative clauses are headed by either an external or an internal DP.

4.2. Content interrogatives

In simple questions, content interrogatives are often associated with word order re-organization (e.g. displacement of an interrogative pronoun to the edge of the sentence). In languages with relatively free word order they may generate ambiguity (e.g. the sequence WHO STUDENT LOVE can be interpreted either as a subject oriented question or as an object oriented question if the language allows the order SOV). Content interrogatives are also part of a cluster of constructions that may induce long-distance syntactic dependencies and a series of related phenomena (e.g. syntactic islands, etc.). All these are syntactic contexts in which atypical development may affect language proficiency and result in poor performances in subjects with language disorders.

4.2.1. Checklist and State of the Art

Content interrogatives are treated within Part 5 Syntax, Chapter 1 of the SignGram Blueprint. Interrogative pronouns are treated in Part 3 Lexicon. Content interrogatives have never been investigated in LSF. The relevant portion of the checklist is provided below.

Lexicon, Chapter 3

3.7.5. Interrogative pronouns.

Syntax, Chapter 1

1.2.3. Content interrogatives

1.2.3.1. Non-manual markers in content interrogatives

1.2.3.2. List of wh-signs

1.2.3.3. Content interrogatives without wh-signs

1.2.3.4. Non-interrogative uses of wh-signs

1.2.3.5. Position of wh-signs

1.2.3.6. Split between the wh-sign and its restriction

1.2.3.7. Doubling of the wh-sign

1.2.3.8. Multiple wh-signs in interrogatives

1.2.3.9. Interrogative particles

Of these topics, those particularly relevant for WP2.3 are listed below:

1.2.3. Content interrogatives

1.2.3.1. Non-manual markers in content interrogatives

1.2.3.2. List of wh-signs

1.2.3.5. Position of wh-signs

1.2.3.6. Split between the wh-sign and its restriction

In addition to the general description of content interrogatives, WP2.3 needs a specific analysis on potential cases of ambiguity. This has been conducted in parallel to the general description of content interrogatives.

- No previous research on these topics has been documented for LSF.

4.2.2. Goals for WP 2.3

Given the freedom in terms of word order normally found in SLs, it is expected that wh-phrases may generate ambiguity. For example, in the case of clause final positioning of the wh-phrase and the preverbal object, the order **Noun Verb wh-sign** is expected. This string of signs is in principle ambiguous between a question on the object (e.g. *who did*

John invite?) and a question on the subject (e.g. *who invited John?*). Disambiguation is easy in normal speakers, but it is problematic in special populations.

Embedded content questions also require mastering a particularly complex structure and syntactic operations which could be problematic in atypical populations.

The specific goals of this study for WP2.3 in this respect are:

- Find unambiguous and ambiguous (if possible) content interrogatives with bare wh-phrases (*who*)

- Find unambiguous and ambiguous (if possible) content interrogatives with non-bare wh-phrases (*which NP*)

- Investigate whether matrix questions with embedded wh-phrases are possible in LSF

4.2.3. Methodology

Content interrogatives have been elicited with a replacement strategy and with a linguistic game.

- The list of wh-signs has been recovered from on-line dictionaries (see references).

- These signs have been validated by our informants as being part of their vocabulary (i.e. no dialectal variation was found here).

- The informant is shown a simple declarative and is asked to repeat it.

- Then the informant is asked to substitute one of the nominal constituents with a wh-sign.

- Then the signer is asked to produce the appropriate question with that wh-sign and a possible answer.

- In the language game the researcher provides an utterance in LSF and the informant is asked to come up with an appropriate question for which the sentence produced by the researcher is the answer. An example is given below:

     Researcher: My name is Carlo

     Informant: What's your name?

  This strategy is particularly useful for those content interrogatives where SLs normally do not have a wh-sign. For example, of the SL equivalent of English phrases like *at what time…*, *how old…*, etc.

- In all cases, acceptability and felicity judgments are collected on pairs of questions and answers.

4.2.4. Overview of the results

- **Wh-signs**. LSF has a full set of wh-signs with specialized functions: who, what, where, when, how, etc.

- **Wh-phrase**. Content interrogatives normally involve wh-signs and a set of NMMs. These NMMs are: furrowed eyebrows and squinted eyes. Furrowed eyebrows and squinted eyes very often co-occur with manual wh-signs, but we do have tokens in which those NMMs are absent. When NMMs occur, they may spread over portions of the sentence larger than the wh-constituent.

- **Non-interrogative uses**. Wh-signs can be used to head free relatives (e.g. who entered wanted to steal something).

- **Word order**. As far as the word order is concerned, the canonical position of wh-signs and wh-phrases is the *in situ* position (like in Japanese).

                  _____**wh**

JEAN EAT WHAT

'What did Jean eat?'

              ____**wh**

WHO EAT PIZZA

'Who ate pizza?'

- **Non-canonical orders** with wh-signs at the beginning or at the end of the sentences are also possible, although in some cases these orders may lead to some ambiguity (see below).

- **Emphatic duplication** of wh-signs at the beginning and at the end is also possible. In these cases there is wide spreading of the NMM.

         _____**wh**

WHO EAT PIZZA WHO

'Who ate pizza?'

- **Wh-split** between the wh-sign and its restriction is also possible, although in some cases it generates ambiguity (see below).

               ____**wh**

STUDENT EAT PIZZA WHO

'Which student ate pizza?'

- **Ambiguity**. As requested by WP2.3, further research on canonical and non-canonical orders was conducted to investigate what kind of constructions may generate potential cases of ambiguity and how ambiguity is prevented. In particular, the following cases have been considered:

  o bare wh-signs

  o restricted wh-phrases in which the restriction is a nominal element (e.g. *which boy*)

  o restricted wh-phrases in which the restriction is a pointing sign (e.g. WHO IX)

These cases are investigated in both agreeing and plain verbs, leading to the following paradigm:
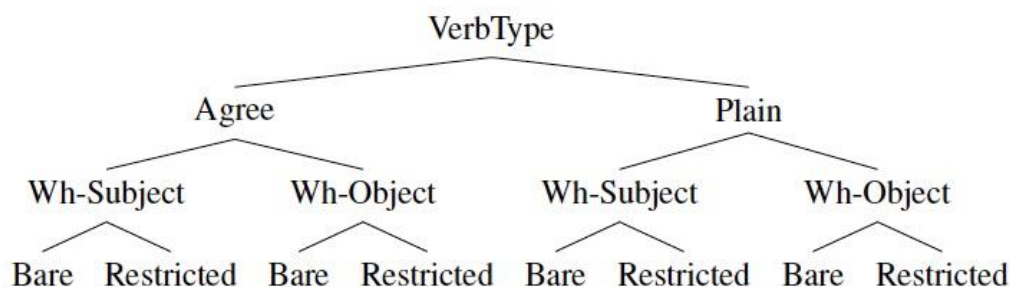
Figure 3: Schema of the paradigm of content questions

In the case of canonical order with *in situ* wh-phrases, sentences are interpreted unambiguously. Access to alternative readings is normally impossible or highly marginal. An example is given below:

PRESIDENT KNOW WHO

'Who does the president know'

Intended as a sequence of OV wh-sign: Who knows the president

Clause final wh-signs with the restriction stranded in situ generate ambiguity but the kind of ambiguity may vary. Two examples are given below:

SCRATCH CAT WHO

'Who scratched the cat?'

'Which cat scratched somebody?'

(CAT WHO is interpreted as the subject and the verb has an implicit object)

KING SPAIN KNOW WHO

'Who knows the king of Spain?'

(WHO is interpreted as the subject and KING SPAIN as a preverbal object)

'Who does the king of Spain know?'

(WHO is interpreted as the object and KING SPAIN as the subject)

Signers may in principle employ different strategies to minimize ambiguity, e.g. they may use signing space or pointing signs to unequivocally locate the participants. Verb directionality may provide cues in the case of agreeing verbs. However, none of these strategies seem to remove ambiguity completely.

- Finally, long distance dependencies have been investigated. Results show that:
  - o   in-situ wh-signs are interpreted as direct questions even when they are embedded in a sentential complement

    JOHN SAY WHO ARRIVE LATE

    'Who did John said arrived late?'
  - o   wh-signs inside standard relative clauses are not acceptable (i.e., they generate island violations)

    * Ix-1 PREFER DOG PI WHO CURE

    Intended: Who is such that I prefer the dog that s/he is curing?

4.3. Wh-cleft constructions

Cleft constructions are a syntactic way to put a particular constituent under focus (e.g. *it was **Mary** that Paul invited*). In particular, wh-cleft constructions (i.e. *who Paul invited was **Marie***) are typologically related to free relatives (*I will kiss whoever enters through that door*) in spoken languages.

This part of the task has been conducted by Charlotte Hauser with the supervision of Carlo Geraci and Caterina Donati (from WP2.3, qua supervisor of Charlotte Hauser's dissertation).

4.3.1. Checklist and State of the Art

Wh-cleft constructions are mentioned as constructions in which wh-signs are used in non-interrogative contexts and as a general strategy to convey sentential complements. Very few systematic works on this construction have been conducted in SL in general. No work has been done on LSF. In sign language, these constructions are also known as Clausal Question Answer pairs (CQA).

4.3.1. Goals for WP 2.3

Provide an overview of the construction. Identify possible similarities with respect to wh-questions and free relatives.

4.3.2. Methodology

We started by showing a token of wh-cleft found in our corpus of LSF. This token was contained in a video in which one of our informants was explaining in his own words why a certain construction was particularly complicated and heavy. Given the nature of the video, this token of CQA was spontaneously produced. Starting from that structure, then we further manipulated sign order, wh-sign, etc. in a similar fashion as in the previous studies. Sentence evaluation was done with the same methodology as described in the previous sections.

4.3.3. Overview of the results

- **The structure**. The surface structure of wh-cleft is very similar to that of a question-answer pair. Although the final analysis could be different, for simplicity we refer to such constructions as CQA.

  [… YP … wh-sign] [XP]

  [GIANNI EAT WHAT]$_{question}$ [PIZZA]$_{answer}$

  'What Gianni ate is pizza.'

- **Non-manuals**. Wh-signs in wh-questions often co-occur with furrowed eyebrows in LSF (see section 4.2). In wh-cleft constructions, eyebrows are normally raised.

- **Syntactic head**. Similarly to relative clauses, virtually any constituent can be used to create a CQA. The following example shows a case of locative PP introduced by WHERE.

  GIANNI EAT PIZZA WHERE RESTAURANT ITALY

  'Where Gianni ate pizza was at an Italian restaurant.'

- **Sign order**. LSF content questions are produced either with the wh-sign in situ (most preferred option) or with the wh-sign displaced in clause final position. Wh-cleft constructions have both options as well, but the preference is for having the wh-sign displaced at the end of the clause. This is shown by the case of wh-sign targeting the subject of a CQA.

  WHO EAT PIZZA GIANNI

Version 5.5 – 30/11/2017

      EAT PIZZA WHO GIANNI   (slightly preferred option)

'It is Gianni who ate pizza.'

- **Embeddability**. CQA are embeddable in LSF.

  PIERRE HOPE GIANNI BRING WHAT PIZZA

  'What Piero hopes Gianni will bring is pizza.'

4.4. Verb agreement system

Agreement or concord is a morphological phenomenon of dependency according to which part of the shape of a word depends on properties of other words to which it relates. Ultimately, this is the result of a process of feature sharing, whereby the shape of a word is modulated on the basis of some features of the word it depends on.

4.4.1. Checklist and State of the Art

Verb agreement is treated in two parts of the SignGram Blueprint. Part 3 The Lexicon, Chapter 3; Part 4 Morphology, Chapter 3.

Previous literature on LSF treated uses of space in various ways, especially in role-shift constructions. These works showed how powerful, dense and informative signing space is when mental maps are projected into it. The framework of highly iconic structures developed in Cuxac (2000) for LSF is very similar to that of blended space developed for American Sign Language (ASL) in Liddell (2003). Working in Cuxac's framework, Garcia and Balvet (2016) showed that in LSF verb directionality imposes morpho-phonological readjustments such that directional verbs articulated on the body like SAY can easily detach from the body and mark subject and object agreement as typical agreeing verb does.

4.4.2. Goals for WP 2.3

Verb Agreement is one of the most robust phenomena of SL morpho-syntax. It emerges very early in new SLs, it resists in aphasic patients with right hemisphere damage. The goals of this study are:

- Identify the major verb classification

- Provide a description of the LSF agreement system

- Provide a list of agreeing and non-agreeing verbs that can be used as stimuli in WP2.3 tests

4.4.3. Methodology

We applied the same methodology described for the study on word order (see section 3.1). As for the list of verbs, we used previous works on verb argument structure in the typological literature on spoken languages and adapted to the case of SL (Hartmann, Haspelmath and Taylor 2013).

4.4.4. Overview of the results

- **Verb categories**. The classical partition of SL verbs into pain, agreeing and spatial also holds for LSF.

- **Verb valency**. Verb categories have been intersected with valency: 0 argument (weather predicates), 1 argument unaccusative (e.g. die), 1 argument ergative (e.g. walk), 2 arguments (e.g. kill), 3 arguments (e.g. give).

- **Non-manual agreement**. In addition to directional movement, agreement can be (redundantly) marked by using body posture and head/gaze orientation.

  o Non-manuals for subject agreement: The body turns towards the location of the subject.

  o Non-manuals for object agreement: The face of the signer is oriented towards the object

  o Eye-gaze may either keep contact with the signer or be directed towards the object

Other set of non-manuals may be involved as well.

- **Defective agreement**. Body anchored (e.g. plain verbs like EAT) and partially body anchored (e.g. SEE, SAY) verbs may impose phonological constraints on the surface of the directional agreement pattern. Three repair strategies are possible:

  o Using non-manual markers.

  o In second-first person patterns (i.e. you saw me) and second-third patterns (i.e. you saw him), they fully detach from the body.

  o In third-third person patterns (i.e. he saw him) a differentiated pattern is observed: Verbs like SEE establish object agreement via space and subject agreement via non-manuals (orientation alternations might also be involved). Verbs like SAY fully detach and perform subject-object agreement.

  o In neither case, straight directionality can be bent to make an "L" shaped trajectory to mark for subject and object agreement (this replicate in a more systematic way what Garcia and Balvet 2016 have found).

- **Verb list**. The following table provides an outline of the verbs investigated. Spatial verbs are not considered as any blended space may generate locative agreement (Liddell 2003).

Valency/ V. categories	Plain	Agreeing	Defective
0-argument	RAIN, SNOW, WIND	empty by definition	empty by definition
1-argument unaccusative	DIE, BURN, EXIT, GO, LEAVE, COLD/HOT, HUNGRY, SAD/HAPPY, LIVE, SINK, DRY, HIDE, ARRIVE	empty by definition	empty by definition
1-argument ergative	PLAY	empty by definition	empty by definition
2-arguments	BUILD, FEAR, KNOW, THINK, KILL, USE, COOK, FINISH, EVALUATE, STOP, REFLECT, PRINT, LIFT, DO, CHANGE?, IGNORE, WAIT?, GET-ANGRY, WIN	CHASE, HELP, SEARCH, SHOOT, BEAT, SIGN(USE SL), TOUCH, PUSH, STEAL, TEACH, SEND-EMAIL, SEND(TXT MESSAGE), REPLY, VERIFY, DISCUSS	SEE, LIKE, SHAVE, WASH
3-arguments (agreement with 2 arguments)		SEND, THROW, EXPLAIN , ASK, PUT	SAY, CRY

The behavior of BREAK is unclear between middle or fully transitive.

A list of reciprocal verbs is also provided here: LITIGATE, AGREE, DISCONNECT, MEET, KISS.

4.5. Role shift

Role shift (RS) is a sign language phenomenon that may be used in contexts where direct speech is used but has a much more general distribution (Lillo-Martin 2012). Role shift is characterized by two general properties: (i) semantically, the expressions that are signed under role shift are somehow interpreted 'from another person's perspective', or 'with respect to another context' than the context of the actual speech act; (ii) morpho-syntactically, role shift is overtly marked by some modification, which may involve (a) body shift, (b) change in the direction of eye gaze, and/or (c) altered facial expressions in order to mark that the signer is adopting somebody else's perspective.

4.5.1. Checklist and State of the Art

Role shift is treated in Part 5 Syntax, Chapter 3.3.3 and Part 7 Semantics, Chapter 6.

Part 5 Syntax, Chapter 3

3.3.3 Role shift

3.3.3.1 Markers of role shift

3.3.3.2 Integration of the role-shifted clause into the main clause

3.3.3.3 Syntactic contexts introducing attitude role shift

3.3.3.4 Special signs introducing action role shift

3.3.3.5 Syntactic differences between action role shift and attitude

role shift

Part 7, Pragmatics Chapter 6

6.1 Attitude role shift and (in)direct speech

6.2 Action role shift

The work by Cuxac (2000) on highly iconic structures provides an exhaustive description on how role shift works in LSF and what features are involved. Schlenker (to appear) addresses more fine-grained semantic properties of role shift in LSF.

- Cuxac, Christian. 2000. *La langue des Signes Française (LSF) Las voies de l'iconicité*. Ophrys.

- Schlenker, Philippe: to appear, Super Monsters I: Attitude and Action Role Shift in Sign Language. *Semantics & Pragmatics.*

4.5.2. Goals for WP2.3

WP2.3 is designing a test to detect ambiguity driven by RS constructions when introduced by the verb SAY. This is illustrated by the following example, where the pointing sign directed towards the signer may refer either to signer (like the indexical English pronoun *I*) or to the subject of the matrix clause (VALENTINA, in the example below).

VALENTINA SAY IX-1 WIN LOTTERY

Intended 1: Valentina said that I (the signer) won the lottery

Intended 2: Valentina said that I (Valentina) won the lottery

In the actual test, ambiguity will be targeted by a sentence-picture matching task.

The goals for the WP 2.1 subtask are:

- To provide a brief description of how role shift works in LSF

- To confirm that under certain circumstances role shift may generate ambiguous interpretations

4.5.3. Methodology

We showed examples of role shift constructions from previous unpublished works conducted in our group that replicated some of Schlenker's (to appear) examples. We started from these clear cases and asked our informant to produce the following pattern:

IX-1 WIN LOTTERY

'I won the lottery.'

IX-3 WIN LOTTERY

'S/he won the lottery.'

VALENTINA SAY IX-1 WIN LOTTERY

'Valentina said I won the lottery.'

VALENTINA SAY IX-3 WIN LOTTERY

'Valentina said s/he won the lottery.'

_____+ body shift; +head tilt; - eye contact

VALENTINA SAY IX-1 WIN LOTTERY

'Valentina said I won the lottery.'

_____+ body shift; +head tilt; - eye contact

VALENTINA SAY_{DETACHED} IX-1 WIN LOTTERY

'Valentina said I won the lottery.'

VALENTINA SAY WIN LOTTERY

'Valentina said to have won the lottery.'

Then we asked our informant to produce the following scenario:

Scenario: Valentina is chatting with a friend of her.

Finally, each sentence was played back to collect acceptability and felicity with respect to the reading in which IX-1 refers to the signers and the reading in which IX-1 refers to the subject of the matrix clause, with and without an introductory scenario. Sentences with third person pointing signs have been used as baselines. Detached variants of SAY are used to further test whether ambiguity results even in these cases. The obligatory control (PRO) construction (i.e. infinitival-like complement) was elicited as a baseline to have obligatory shared subject between the matrix and embedded subject.

4.5.4. Overview of the results

Findings from the previous literature (Cuxac 2000 and Schlenker to appear) are the following:

- **Markers of role shift**. Role shift can be prosodically introduced by breaking eye contact with the addressee, head turn and body leaning. This cluster of features need not appear at the same time, it may have different spreading and intensity.

- **Direct vs. reported discourse**. Like in ASL and differently from Catalan Sign Language (LSC) and German Sign Language (DGS), role shift does not allow for mixed indexical shifting in LSF. For instance, the following sentence has the reading indicated in the translation in LSC and DGS but not in ASL and LSF:

IX_A MADRID_M MOMENT JOAN_i THINK IX-1_i STUDY FINISH HERE_B

`When he was in Madrid, Joan thought he would finish his studies there in Barcelona.'

NPI licensing and wh-extraction prove that the complement of attitude verbs is not part of direct discourse in ASL. These diagnostics do not seem to be reliable in LSF (Schlenker to appear). As a consequence of this, it is not completely straightforward to distinguish between role shift in indirect discourse, and role shift in direct discourse. However, this detail is only marginally relevant to WP2.3, as what is relevant is whether sentences under role shift can be ambiguous or not independently from the syntactic status of reported vs. direct discourse of the entire construction.

Findings coming from the research connected to SIGN-HUB:

- **Obligatory control structures** (i.e. infinitival like complement). The subject of the embedded clause must be the same as the subject of the matrix clause.

    VALENTINA SAY WIN LOTTERY

    'Valentina said to have won the lottery.'

    # **Intended**: Valentina said that the signer has won the lottery.

    # **Intended**: Valentina$_v$ said that someone$_{k \neq v}$ has won the lottery.

    This sentence is used as a baseline to test subject sharing between the main and subordinate clause.

- **Overt IX-3 subject in the embedded clause**. Without role shift prosodic cues and in out-of-the-blue contexts, the third person pointing sign receives a non-bound interpretation. It can marginally be bound by the matrix subject, but, as expected, cannot refer to the signer.

    VALENTINA SAY IX-3 WIN LOTTERY

    'Valentina$_v$ said s/he$_{k \neq v}$ won the lottery.'

    ?? **Intended**: Valentina$_v$ said s/he$_v$ won the lottery.

    # **Intended**: Valentina$_v$ said I$_{signer}$ won the lottery.

    There are two reasons why the overt IX-3 pointing sign is slightly degraded:

    - Mental space may force disjoint reference
    - The control version is a better way to express the intended meaning

    This sentence is used as a baseline to show that indexical shift does not apply to any token of pointing pronoun, but only to indexical pronouns the first person uses.

- **Overt ix-3 subject within the scenario.** When a minimal scenario is provided, the bound reading becomes impossible.

    Scenario: Valentina is chatting with a friend of her.

    VALENTINA SAY IX-3 WIN LOTTERY

    'Valentina$_v$ said s/he$_{k \neq v}$ won the lottery.'

    # **Intended**: Valentina$_v$ said s/he$_v$ won the lottery.

    # **Intended**: Valentina$_v$ said s/he$_v$ won the lottery.

    This pattern is due to the fact that the mental space is constructed such that Valentina and the referent of IX-3 must be disjoint. This sentence is used as a baseline to show that indexical shift does not apply to any token of pointing pronoun, but only to indexical pronouns with first person uses.

- **IX-1 in the embedded clauses**. Without the prosodic markers of role shift and in out-of-the-blue context, the first person pronoun is interpreted indexically as referring to the signer. Other options are not acceptable.

  VALENTINA SAY IX-1 WIN LOTTERY

  'Valentina said I_signer won the lottery.'

  # **Intended**: Valentina said that she_valentina won the lottery.   (role shift)

  # **Intended**: Valentina said that someone_≠ valentina won the lottery.

This example proves that role shift is not always available. However, when a minimal scenario is used to introduce the very same sentence, then the shifted interpretation becomes available and the sentence is ambiguous between a role shift interpretation and a non-shifted interpretation. Third person interpretations different from the subject of the matrix clause are not acceptable:

  Scenario: Valentina is chatting with a friend of her.

  VALENTINA SAY IX-1 WIN LOTTERY

  'Valentina said I_signer won the lottery.'

  'Valentina said that she_valentina won the lottery.'   (role shift)

  # **Intended**: Valentina said that someone_≠ valentina won the lottery.

What these data show is that role shift interpretations can be introduced via context manipulation only. There is no need of overt prosodic cues to have indexical shift. This introduces an interesting opportunity. In particular, in absence of prosodic cues, indexical shifting can be derived by minimally manipulating the scenarios.

- **SAY + prosodic markers of role shift**. In out-of-the-blue contexts, the markers of role shift do not seem to trigger indexical shifting.

  _____+ body shift; +head tilt; - eye contact

  VALENTINA SAY IX-1 WIN LOTTERY

  'Valentina said I_signer won the lottery.'

  # **Intended**: Valentina said that she_valentina won the lottery.   (role shift)

  # **Intended**: Valentina said that someone_≠ valentina won the lottery.

This fact is quite surprising as role shift in other sign languages, minimal prosodic cues are sufficient to trigger role shift interpretations (e.g. Herrmann and Steinbach 2012). No mentioning of this fact is done in previous LSF literature on the topic. More research is needed to understand how robust across signers this fact is and whether manipulation of the spreading domain of role shift markers makes role shift interpretations accessible in these scenarios. Crucially, once introduced by a minimal scenario, role shift interpretations are accessible:

  _____+ body shift; +head tilt; - eye contact

  VALENTINA SAY IX-1 WIN LOTTERY

  'Valentina said I_signer won the lottery.'

  'Valentina said that she_valentina won the lottery.'   (role shift)

  # **Intended**: Valentina said that someone_≠ valentina won the lottery.

What these facts seem to suggest is that at least in LSF, prosodic cues are not enough to trigger role shift interpretations (even in real space uses) and that a minimal scenario (generating a blended space) is needed.

Version 5.5 – 30/11/2017

- **SAY_{DETACHED} + prosodic markers of role shift**. In cases in which the verb SAY is detached, namely it shows directional agreement with the subject of the matrix clause, first person pronoun is never interpreted as shifted. The presence or absence of a scenario is not making any difference. The relevant example is given below:

<u>   </u> + body shift; +head tilt; - eye contact

VALENTINA SAY_{DETACHED} IX-1 WIN LOTTERY

'Valentina said I_{signer} won the lottery'

Intended: Valentina said that she_{valentina} won the lottery   (role shift)

Intended: Valentina said that someone_{≠ valentina} won the lottery

This fact shows that the typical markers of role shift do not automatically introduce/force shifted interpretations of the indexical first person pronoun and that grammatical agreement may block role shift interpretations. The reason is that overt agreement makes the location of the subject (which is associated to the detached location) and the location of the signer's body spatially inconsistent.

To conclude, what seems to be relevant to trigger role shift is the presence of a contextually salient spatial configuration that allows for indexical shifting. This can be easily provided by minimal scenarios. In all those cases, the sentences are ambiguous between a shifted and non-shifted interpretation. The presence of overt prosodic markers seems to play a relatively marginal role. However, in case of spatial mismatch like the one introduced by the detached version of SAY, the shifted interpretation is not accessible.

5. Conclusions

In this WP 2.1 subtask, the CNRS unit worked with native signers of LSF to provide morpho-syntactic descriptions of the following constructions in LSF:

- Relative clauses

- Content questions

- Wh-cleft

- Agreement

- Role shift

The investigation of these topics required some preliminary research to set the appropriate baselines. Specifically, we investigated word order and coordination/subordination.

On each of these topics, we focused on the particular needs of WP2.3 the team working on sign language assessment to have reliable information to be used to create experimental stimuli to assess LSF proficiency. The descriptions of these grammatical phenomena and constructions can be used:

1) As criteria to select items to measure LSF proficiency in various tasks

2) As diagnostics for new items to be used in the tests

We strongly believe that within the temporal and budget limits of SIGN-HUB, the CNRS unit provided sufficient information to WP2.3 team. However, there are certain aspects that still deserve further investigation, like word order & constituent questions. While the LSF used by the informants available for this project is clearly of the SVO type, it is likely that there are varieties of LSF for which the canonical word order could be different, as also documented in the literature of LSF. It is possible that the variety of LSF used by these other signers might be different in other respects as well. One crucial point is whether the canonical order of constituent questions involves displacement of the wh-sign in these varieties. If so, it remains to be investigated whether in these varieties a richer pattern of ambiguity emerges. These facts can only be studied with informants that have SOV as canonical sign order.

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<u>Web dictionaries</u>

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- Spread the Sign www.spreadthesign.com
- LSF DICO http://www.lsfdico-injsmetz.fr/
- Sematos http://www.sematos.eu/