

Article

Deaf Signers' Processing of the Sentence: An Indicator of Their Specific Pathway to the Written Word?

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Abstract: This article addresses the issue of access to the written word for deaf people whose main language is sign language. We question the status of sentence processing in the acquisition of a written language by deaf people, visual beings par excellence. This written language is both the written form of another language (namely a vocal language) and another modality, that of writing (as opposed to the oral form of language i.e., the face-to-face form of language), which they have not experienced in their own, non-written language. We highlight two points in the literature that we feel are crucial to addressing this issue: first, the significant linguistic distance between their L1 (SL) and their L2 (written vocal language), which severely limits the possibility of positive transfer from one to the other; and secondly, the evidence of a cognitive functioning specific to deaf people, marked in particular by higher processing capacities in the visual domain. Based on the results of two studies on the written output of deaf people, we suggest that particularities in the acquisition of the sentence are closely linked both to the structure of SL and to the visual functioning of this population. Finally, we emphasize the importance of using sign language as a metalanguage in teaching writing to deaf signers.

Keywords: sentence; subordination; deaf people; sign language; French sign language; access to the written word; typological distance; linguistic transfer; modality; visual learners



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1. Introduction

Sign Languages (SLs), which are non-written languages,¹ are fundamentally oral—i.e., face-to-face—languages. For deaf signers,² acquiring written language therefore means gaining access to the written form of another language, which is necessarily a vocal language (VL).³ In other words, for them it is a matter of simultaneously accessing another language (L2 vs. L1)⁴ and another modality (written vs. oral) that they have not experienced in their own language.

Now, the 'sentence' is, like the 'word', a graphic unit of written language—marked by typical signs of this modality, such as the capital letter and the full stop—and without a simple or unambiguous correspondence with an oral unit (e.g., Pontecorvo 1997). Questioning how deaf people access the notion of the 'sentence' therefore offers a fruitful counterpoint to the theme of this issue: evaluating the status and role of this notion in the acquisition of a written language, which, in this case, is also a second language.

We will first highlight two points in the literature that we feel are crucial to understanding how deaf learners may or may not appropriate the sentence in French (Section 2): on the one hand, the significant typological and linguistic distance between their L1 (LSF) and their L2⁵ (written French), which strongly reduces the possibility of positive transfer from one to the other; and on the other hand, the evidence of a cognitive functioning specific to deafness, marked in particular by higher processing capacities in the visual domain in the deaf. This will enable us, secondly, through the results of two studies on the written language of the deaf, to suggest that particularities in the acquisition of the sentence unit,

particularly the complex sentence, are closely linked to both the structure of LSF and the visual functioning of this population (Section 4). We will finally propose a short discussion of these results (Section 5).

2. Preliminary Remarks

2.1. A Specific Pathway to the Written Word in Deaf People

A large number of studies report important differences between deaf and hearing people in the processing of written language. The first is the lack of a clear link between deaf people's phonological skills and their reading skills (Clark et al. 2011; Mayberry et al. 2011; Emmorey 2020). Indeed, deaf people have a strong tendency to identify words via their visual form only, without making links with the spoken form of the language, even if they have developed effective phonological awareness (Bélanger et al. 2012; Bélanger and Rayner 2015). The second difference concerns the way deaf people use their eyes when reading. By comparing the eye movements of deaf and hearing people during a reading task, Bélanger and colleagues observed, in deaf people (good readers)⁶, increased skills in processing words in a text during a single eye fixation thanks to an enhanced perceptual span. Thus, when the eye lands on a point in the text, deaf readers process more words at its periphery, allowing for more spaced saccades from one fixation point to another in the text and less frequent backtracking than in hearing readers (Bélanger et al. 2012, 2017; Bélanger and Rayner 2015). Emmorey (2020) shows that competent deaf readers activate more neuronal regions involved in semantic processing than hearing readers during reading. These significant differences and the evidence of superior visuo-spatial skills in the deaf (see, for example, Neuville 1991; Emmorey 2002) have led some authors to postulate a specific cognitive functioning in deaf people (Daigle and Dubuisson 1998; Garcia and Perini 2010; Perini 2013; Beaujard and Perini 2020), which certainly has implications for processes of entering the written word. By mobilizing the sense of sight to the maximum, deaf people can directly establish solid connections between form and meaning and quickly extract information from blocks of graphic units available in central and peripheral vision.

2.2. Linguistic Specificities of LSF (L1) Compared with Written French (L2)

LSF and written French cannot be compared without taking into account the channel through which meaning is transmitted (visuo-gestural for LSF; audio-vocal for French), i.e., their 'modality'. In fact, each modality imposes its own constraints and opens up its own semiotic potential, which even has an impact on segmentation levels. To illustrate this point, we compare a complex sentence in written French and its translation into LSF. The source text and the corresponding LSF video come from the bilingual news medium *Média'pi*! The translation was carried out by a team of professional interpreters. The chosen extract deals with the point of view of 'pro-vaccine' people in the context of COVID-19, referred to in the sentence as 'those persons' (1).

- (1) **Ces personnes** insistent sur le fait que c'est une preuve de solidarité pour protéger **les personnes les plus vulnérables**, ainsi que **les personnes qui ne peuvent pas se faire vacciner**.
These people insist that this is a demonstration of solidarity to protect **the most vulnerable people**, as well as **those who cannot be vaccinated**.

The personal references coded by Noun Phrases (NPs), which are in bold in sentence (1), correspond to three distinct groups: (1) pro-vaccine people, (2) the most vulnerable people, and (3) people who cannot be vaccinated. To restrict the reference domain to these three specific groups, three linguistic strategies are used in this example:

Entity 1: anaphoric use of an anterior NP with a demonstrative determiner ("the pro-vaccine people" > "these people");

Entity 2: use of a superlative (the most vulnerable);

Entity 3: use of a restrictive relative clause, introduced by the relative pronoun “who” (only people who cannot be vaccinated are taken into account).

This third construction implies a hierarchy of two constituents (Riegel et al. [1994] 2009): the complete NP, whose head “personnes” belongs to the *matrix* clause,⁷ and the clause embedded in this NP, which depends on it (Figure 1).

GN	[personnes	[qui ne peuvent pas se faire vacciner]]
NP	[people	[who cannot be vaccinated]]

Figure 1. Schematic representation of the Entity 3.

Now let us look at the corresponding utterance in LSF. The linear representation of the lexical units (LUs) used by the signer, presented in their order of appearance (Figure 2), calls for two important comments: the absence of units with a grammatical role (tool word equivalents) and the significantly different ordering of the displayed information.

[POINTING] [SAY] [IMPORTANT] [WHAT] [PEOPLE] [VULNERABLE] [PEOPLE] [NOT ABLE TO] [TO BE VACCINATED] [POINTING] [VACCINE] [IN ORDER TO] [DEMONSTRATE] [THERE] [SUPPORTIVE]

Figure 2. List of LUs in the LSF sequence corresponding to sentence (1).

All the LUs in this sequence indeed carry a strong semantic charge, unlike the many words used in (1), such as “le; qui; est; un; de...” ([“the, who, is, a, of...”]). We can also see that referential entities 2 and 3, presented at the end of sentence (1), appear here before the expression of the pro-vaccine group’s opinion about them. This is a typical order of argument presentation in SLs when a directional verb,⁸ such as [DEMONSTRATE], is used. To understand the semantic roles played by these entities (who demonstrates to whom?), we need to consider the way in which the signer uses the signing space, as illustrated in Figure 3: the signer activates three different points in the signing space (loci), to each of which she assigns a referential entity by producing the corresponding sign.

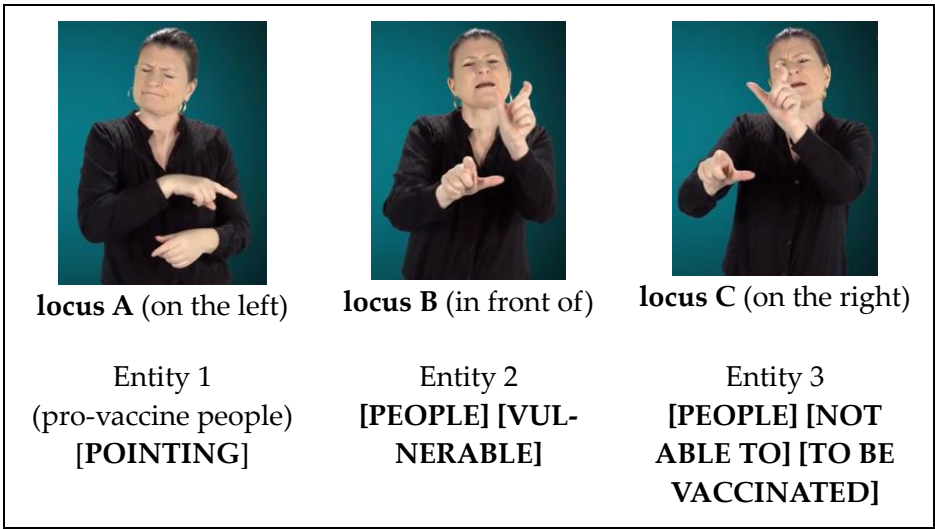


Figure 3. Spatialization of three referents in LSF discourse.

Having created these three loci, the signer points manually to locus A (her gaze is also directed at this locus), thus reactivating the reference (the pro-vaccine group), as shown in Figure 4.



Figure 4. Pointing/looking at locus A to reactivate the referent (anaphoric reprise).

She then creates a sequence which, in literal French, would be “vaccination is there to demonstrate. . .” The LUs [VACCIN], [FOR], and [DEMONSTRATE] are produced at locus A, but [DEMONSTRATE] moves to loci B and C, clearly highlighting the semantic role of entity 1 compared to entities 2 and 3.

The sequence ends with the realization of the signs [THERE] and [SUPPORTIVE] at loci B and C, which can be roughly translated as “. . .a bond of solidarity with the weak and those who cannot be vaccinated”.

This complete final sequence can be represented as in Figure 5.

Pointing VACCINE IN ORDER TO	DEMONSTRATE	THERE SUPPORTIVE
Locus A (anaphora)	Loci B and C (anaphora)	

Figure 5. An example of spatialization of lexical units (LUs) in LSF discourse.

Spatialization—a linguistic strategy without any equivalent in VLs—has two major advantages in this example:

(1) It allows a reference to be introduced, maintained, or reintroduced simply by activating/reactivating a locus. After activating a part of space by pointing and assigning it a referent, the signer can add information about this referent by placing LUs at this locus. Anaphoric repetitions are made in the same way, through reactivation by gaze alone, by pointing, or through a lexical sign made directly at the locus ([VACCINE]).

(2) Spatialization marks the semantic relations between referential entities through the realization of directional signs moving from one locus to another, as we saw with [[DEMONSTRATE], a linguistic unit whose movement alone encodes the agent (A), the action (demonstrate), and the beneficiary (B and C).

This use of space implies a reduced use of grammatical units in SL; no LUs resembling personal pronouns are used in this example. The conjunctive locution “as well as” in sentence (1), linking NPs 2 and 3, is also not expressed by an LU in LSF, its meaning being inferred from the movement of LUs [LÀ] and [SOLIDAIRE] to loci B and C. Moreover, there is no subordinator in LSF that would indicate a restriction of the domain of reference since the spatialization of each entity and the spatial grouping of LUs assigned to the same locus prevent any referential ambiguity. In LSF, for example, the NP “people who cannot be vaccinated” is composed of a single constituent delimited by a locus without any evidence of embedding of the kind shown in Figure 1.

The visuo-gestural channel thus enables SLs to achieve substantially different linguistic resolutions than VLs. The audio–phonatory modality strongly constrains VLs to the linear sequencing of linguistic units, implying, for French, a constrained order of units within the proposition and the use of grammatical morphemes and syntactic pegs (such as

subordinators or coordinating conjunctions) to mark links between constituents. The four-dimensional nature of the visual-gestural modality⁹ enables SLs to arrange information on two levels of syntactic information: the sequence of signs in the signed chain, linked to their temporal unfolding, as shown in Figure 2, and their arrangement in space (loci), as shown in Figures 3–5. Thus, in addition to the fundamentally oral nature of SLs, this particularity calls into question the possibility of a traditional segmentation of utterances into sentences and clauses.

2.3. *The Issue of Linguistic Transfer from a Sign Language to a Written Vocal Language*

There is now a solid body of literature recognizing the importance of L1 in learning an L2 (for a review, see Ellis 2015). The same applies to the mastery of a SL in deaf people for the acquisition of a written language (Hoffmeister et al. 2022; Liu 2022). Nevertheless, the large L1/L2 typological gap may also explain, according to Ellis (2015), certain difficulties in appropriating L2 linguistic categories.

In an attempt to further clarify the explanatory power of linguistic distance, a series of works have shown that difficulties associated with linguistic distance lie particularly in the domain of grammatical marks (Eckman 1977; Hyltenstam 1984; Kellerman 1989; cited by Ellis 2015). For LSF L1 and written French L2, two languages that are typologically very far apart, we need to consider two cases of linguistic transfer. In the first case, a linguistic feature of LSF is transferred to written French. There are many examples of inversions in deaf writing, corresponding to the visual logic that structures the organization of information in LSF (Cuxac 2000): “possessor before possessed” (“Évelyne l’anniversaire”),¹⁰ “stable before moving” (“La Madeleine tourne autour des voitures” [(Place de) La Madeleine drives around cars]), or “localizer before localized” (“l’aquarium est dans le poisson”¹¹ [the aquarium is in the fish]). The second type of transfer occurs when a grammatical feature expected in L2 is omitted due to its absence in L1. In particular, it has been observed that if a linguistic category is not marked in the source language, the L2 learner will be more inclined not to mark it in the target language, a sign of negative transfer (Jarvis and Pavlenko 2008).

The scarcity of grammatical morphemes in the written production of the deaf (prepositions, determiners, and relative pronouns, for example) could thus be explained by the scarcity or absence of such grammatical units in LSF (see, for example, Vincent-Durroux 2004). It is indeed tempting to postulate a transfer, either positive (organization of information) or negative (absence of grammatical morphemes), from LSF to written French. However, observation of the written output of deaf people with no knowledge of LS shows the same characteristics with regard to word order and the omission of grammatical morphemes. A cognitive organization specific to deaf people would therefore be a more satisfactory explanation, even if we cannot ignore the catalytic effect that SL can have when it is the L1 of deaf learners of written French.

Our research question, then, is to understand how do deaf signers apprehend the sentence unit, given the major typological differences between LSF (SL) and written French (written language)? Our first hypothesis is that there can be no negative transfer concerning the formal delimitation of the written sentence insofar as the boundaries of the sentence are visually salient (capital letter—period). However, this does not rule out the possibility of re-motivation of these visual markers in weaker learners. With regard to intra-sentence organization, our hypothesis is as follows: the conflict between the use of space (in SL) and the linearization of information (in writing) may result in deaf learners having difficulty articulating dependent and independent propositions compared to hearing learners with an equivalent level of written French. This could give rise to a preference for coordination, but also to idiosyncratic uses of the subordinators “que” and “qui”, due to their frequency in the input.

3. Materials and Methods

3.1. Study 1: Cross-Sectional Study of Written French Narratives in Deaf People

In this first study (Perini 2013), the aim was to investigate the existence of a linguistic system specific to deaf people. We collected a corpus of 21 narratives produced by profound prelingual deaf adults with widely varying reading levels and different linguistic and educational profiles. During writing workshops, participants were asked to imagine and write a story based on a single picture (Figure 6). The question they had to answer in their text was “what happened?” At the end of the workshop, they were asked to tell the group what they had written, either in French or in LSF. In parallel, we collected the writings of two control groups of hearing adults (12 learners of French as a foreign language and 8 native French speakers) who completed the same task.



Figure 6. Drawing used as a stimulus for written production in Perini (2013).¹²

In a first series of qualitative analyses, we identified three degrees of competence, defined by a combination of pragmatic and textual features (task suitability, interpretability, graphic presentation, length). We then carried out more detailed analyses of deaf writers' strategies for developing information in their text. In this article, we will only present our comments on sentence processing, organized according to the three degrees of our classification. Our specific aim here is to sketch out a typology of sentence unit acquisition pathways in the deaf population.

3.2. Study 2: Relative Clause Processing by Deaf Signers Proficient in Written French

This second study (Dadone, forthcoming) focuses specifically on the appropriation of the relative clause in written French among deaf learners with LSF as their main language and an advanced level of written French (corresponding to degree 3 in Study 1). At this level of mastery, the relative clause in “qui” and “que” is acquired in hearing learners of French as a foreign language but we hypothesized, based on empirical observations, that it constitutes a point of resistance for deaf people.

We present preliminary results from two written production tasks (narrative text and expository text) and a written text correction task. For the written production task, which incorporates part of the protocol developed as part of the Spencer project,¹³ participants were first asked to watch a wordless video presenting a series of problems linked to the school environment, such as arguments or exclusion. The first task involved recounting a personal memory related to one of the themes addressed in the video while, in the second task, participants were asked to report on their knowledge of the various problems encountered in the course of school life. For the correction task, participants were exposed to a semi-authentic text, containing both subordination errors and a number of varied errors serving as distractors.

4. Results

4.1. Study 1: Differences between Deaf and Hearing People in Their Command of Sentences and Clauses

4.1.1. Visual Markers of the Sentence: Standard and Idiosyncratic Usage

Even at the first level of competence (characterized by very short texts, which cannot be interpreted without knowing the picture on which they are based), our deaf and French-as-a-foreign-language writers make relatively standard use of periods and capital letters to delimit sentences. However, three of the deaf learners (Sofia, Simon, and David) and eight of the French-foreign-language ones do not systematically capitalize the beginnings of sentences. On the other hand, contrary to our expectations, in two of the deaf writers, the graphic markers at the beginnings and ends of sentences are poorly mastered. In the first case, we observe a juxtaposition of mainly ungrammatical words, that is, full words, with very little structure provided by tool words or punctuation marks.

- (2) entre dibute les deux copains par jalousie que achete le beau tableau ventre par une femme eclate que le tableau cassé, une femme mettre en colère en plus leur chien aboit. (Mathieu G1)
[between argument the two buddies out of jealousy that to buy the pretty painting etc.¹⁴]

In the second case, we observe a graphic segmentation using mainly hyphens, which seem to delimit grammatically and semantically coherent groups of words.

- (3) Ce Couple étant partir en vacances—ayant acheter un Joli Tableau de Souvenir—ceci à leurs Retour chez eux—les mois suivants sont passés. le Tableau était mis sur un Mur de la Salle à Manger—par un clou qui a fallu du Temps pour l'enfoncer—ayant été fissuré par la force de frappe du Marteau. (David G2)
[This Couple being to go on vacation—having buy a Pretty Souvenir Painting—this on their Return at home—the following months passed. the Painting was placed on a Dining Room Wall—by a nail who took a long Time to sink it—having been cracked by the force of the Hammer blow].

Another interesting fact is that five deaf people (groups 1 and 2) and five hearing French L2 writers produce a significant number of words beginning with a capital letter in the middle of 'sentences'. But the choice of words marked in this way seems random in the case of the French L2 writers (they may be grammatical words, for example), whereas in the case of the deaf, they are systematically key words for the narrative, such as "Tableau", "Marteau", and "Tête". This strongly suggests a re-motivation of capitalization, based on visual logic.

4.1.2. Internal Organization of the Sentence

The focus here is on the number, length, and nature of clauses at all three levels of proficiency. For the first two levels, this inventory of clauses is very difficult to carry out because a number of phenomena complicate the traditional segmentation of French:

- The non-repetition of a referent in subject or object position, as in (4), where the word "armoire" is both a complement of "dire" and the subject of "bouger":
(4) j'aurais dit pour l'armoire était déjà bougé (Simon G2)
[I would have said for the wardrobe was already moved]
- The absence of a verb, which does not necessarily hinder comprehension, as in (5):
(5) C'est très très cher le tableau, peinture en huile (Cédric)
[It's very, very expensive the painting, oil paint]
- An idiosyncratic use of the tool word "que", often with a coordinative value, or expressing cause or consequence (and not subordination), as is the case in (6), (7), and (8):

- (6) éclate **que** le tableau cassé (Mathieu G1)
[explodes that the painting broken]
- (7) avec surprise **que** le voisin ait trouvé le tableau plein de défauts (David)
[with surprise that the neighbor found the painting full of defects]
- (8) très en colère, furieux **qu'**il enlève le tableau (David)
[very angry, furious that he removes the painting]

Despite these difficulties, which can result in subjective segmentation choices, breaking down the observations into three degrees of competence enables us to observe the gradual implementation of subordination. From a quantitative point of view, it is not surprising that the proportion and nature of subordinates evolves with the degree of competence. For degree 1 of the deaf group, five out of six texts are devoid of subordinates. In degree 2, the average rate of subordination is 6.5%, with great variability from one text to another (from 0% to 15.6%). These first two degrees are thus characterized by an essentially paratactic mode of organization, in contrast to degree 3, which has an average subordination rate of 21.3%, very close to that produced by the French-as-a-mother-tongue writers in our corpus (26.92%).

These results are logical: parataxis is characteristic of learners' productions, both written and oral, as the linguistic forms used to compact information (subordination, integrated constructions, nominalizations) are more complex to implement. On the other hand, the order of acquisition of the different types of subordination seems to differ between deaf and hearing learners. By way of comparison, we can draw on an itinerary proposed by [Hellqvist Herdy \(2010\)](#), shown in Figure 7, concerning Swedish-speaking learners of French.

Written French: qui [who] > quand [when] > que (complétif) [that] > parce que [because] > que relatif [which] > si/même si [if/even if] > comme [like] > où [where].

Figure 7. Acquisitional itinerary for French written subordinates in hearing L2 learners ([Hellqvist Herdy 2010](#)).

In our corpus, we see the very first use of the causal “because” at level 1. Level 2 texts see the development of causal, complementary, and relative subordinates. Level 3 texts are characterized by an increased number and diversification of subordinate clauses (parce que, qui, relative que, complétive que, dont, pourquoi, si, comment, sans que, surtout que, etc.). Our proposed acquisitional itinerary for deaf learners would therefore be as it is shown in Figure 8.

Written French: Parce que [because] > que completeive [that] > qui [who] > que relative [which].

Figure 8. Acquisitional itinerary for French written subordinates in deaf learners ([Perini 2013](#)).

Although these initial results need to be confirmed on a larger corpus, they suggest that the relative clause is mastered much later in deaf learners than in hearing learners of French as a second language. This supports our hypothesis that the relative clause is a point of resistance in the acquisition of written French among deaf people.

4.2. Study 2: Intra-Sentence Organization in Advanced-Level Deaf Learners of Written French

Focusing on advanced-level deaf learners of written French, this ongoing study enables us to refine our understanding of the acquisition mechanisms of French syntax in this population with regard to the segmentation and hierarchization of sentences into clauses. Initial results reveal specificities in the place or nature of relative pronouns and in syntactic segmentation, suggesting that the sentence unit, a fortiori complex, is apprehended differently for this population.

The two examples below (see (9) and (10)), collected from deaf signers with LSF as their main language, illustrate the forms that such idiosyncratic segmentation can take.

- (9) Lorsque je marchais droit vers elles, je les avais aperçu de loin et **qu'**elles me voyaient aussi.
[When I walked straight towards them, I saw them from afar and **that** they saw me too.]
- (10) .. j'appelais à une fille de droite de m'aider **que** j'ai exprimé ce que c'est la réponse de Numéro 1.
[...I was calling to a girl of the right to help me **that** I expressed what it is Number 1's response.]

As we observed in Study 1, this tool word “que” [that] seems to respond to an idiosyncratic rule unrelated to subordination. It is as if the presence of a second personal-mode verb in a sentence had to be signaled by a “que” morpheme. Indeed, in (9), the conjunction “and” does not seem to be sufficient.

Another phenomenon observed in the production task is the absence of a matrix clause when the relative pronoun “qui” is correctly used (presence of an antecedent), indicating that the grammatical morpheme “qui” is not treated as a subordinator. The example below shows that what could play the role of a matrix proposition (“whereas they do”) is a new subordinate proposition, introduced by “alors que [whereas]”.

- (11) On voit que la violence crée l'autre violence. Ceux qui ont dit de ne pas avoir la violence alors qu'ils le font!
[We can see that violence creates other violence. Those who said not to have violence when they are doing it!]

Faced with the absence of syntactic peg equivalents in their L1 lexicon, deaf people seem to reinvest French grammatical morphemes to mark other types of relationships between clauses. In the text correction task, participants were confronted with a sentence containing a subordinator (“qui”) without a matrix clause (12).

- (12) Tous les soirs, une personne qui joue de la musique très fort et dérange les habitants de l'immeuble.
[Every evening, someone who plays music very loudly and disturbs the building's inhabitants]

Of the six participants, two did not consider sentence (12) to be incorrect. One of these two participants, however, has a B2 level¹⁵ in written production, which shows that even at an advanced level, this aspect of the language constitutes a point of resistance. By way of comparison, we submitted the task to two hearing Spanish speakers, one of whom had a comparable or even lower level in French (A2 level in written production); both did not hesitate to reformulate the sentence to make it conform to standard French.

5. Discussion

Of course, these various results and hypotheses would need to be reinforced by studies involving more data from a greater range of signers. Nevertheless, the detailed qualitative analysis of our data suggests that the sentence unit, a fortiori a complex one, is processed differently by deaf signers.

At the two lowest levels (groups 1 and 2), the notion of the sentence, like that of the subordinate clause, is difficult to grasp. Thus, the sentence does not seem to be immediately conceived as a unit of writing, unlike the word, highlighted by the re-motivation of the initial capital letter. In this respect, we need to take into account the effects of (two-century-old) methods of teaching written language to the deaf, which are mostly limited to the (mechanical) learning of word lists (see, among others, Abbou 2017). This quasi-reification of the word, to the detriment of teaching the uses of writing as well as simple syntax, would thus join the visual salience of the word (separated by blanks) to make it the natural unit of writing.

At the other end of the acquisition process, i.e., with advanced learners, when the relative clause appears in written production, it is often first and foremost in idiosyncratic

use. Relative subordination, which is frequent in input but poses difficulties in reading comprehension, leads to a re-motivation of subordinators, which sometimes become simple coordination markers, in writing. How can this be accounted for?

We have invoked the hypothesis of negative transfer from SL (L1) which, as we have seen, mainly exploits spatialization to mark syntactic–semantic relations (and, more broadly, complexity) rather than subordinating words. This fact alone explains the difficulties deaf signers have in conceptualizing the very notion of a subordinating word, to which the relative pronoun belongs. Managing complexity in SL means making maximum use of the syntactic “second level”, space, whereas a written language like French uses a lexicon of syntactic operators (subordinators, conjunctions). This non-isomorphism could lead deaf people to develop an idiosyncratic standard of syntactic groupings intended to construct sentence meaning.

Deaf people’s difficulties with the segmentation and articulation of clauses, i.e., their coordination or subordination in the sentence, would have less to do with linguistic transfer than with a conflict between the semiotic resources specific to each modality, i.e., the conflict between linearity and spatiality. This conflict can be resolved precisely through the mediation of SL as a metalanguage in the teaching of writing to deaf people. This mediation, based on a contrastive analysis of the respective resources of the two languages involved, would have the function of raising awareness of the modes of organization and hierarchization of information specific to each of the two languages.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the deaf informants to publish this paper.

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Notes

¹ On this point, see Garcia and Sallandre (2013), Bianchini (2012), Antinoro Pizzuto and Garcia (2023).

² “Deaf signers” are deaf people who use sign language as their main language (L1).

³ In the literature, the terms “sign languages” and “spoken languages” are generally used to designate, respectively, languages with a visual–gestural modality and those with an audio–vocal modality. Following Antinoro Pizzuto et al. (2007), we opt for the term “vocal languages” for the latter. Indeed, SLs are just as “spoken” as so-called “spoken” languages, on the one hand, and, on the other, this allows us to unambiguously contrast the term “oral” with that of “written”.

⁴ Our L1/L2 distinction is more cognitive than chronological. Indeed, although most signing deaf people were firstly exposed to a vocal language, sign language may have taken on such a large cognitive role that it quickly took on the role of their first language.

⁵ In our (functionalist) linguistic approach, we consider the typological gap between SLs and VLs to be significant due to the iconicity that leads to linguistic structures that are highly specific to SLs.

⁶ We consider a good reader to have a minimum level of B2 according to the CEFR descriptor: “Can read with a large degree of independence, adapting style and speed of reading to different texts and purposes, and using appropriate reference sources

selectively. Has a broad active reading vocabulary, but may experience some difficulty with low-frequency idioms.” <https://rm.coe.int/chapter-3-communicative-language-activities-and-strategies/1680a084b4> (accessed on 15 December 2023).

For the “matrix clause”, we follow the definition given by Riegel et al. ([1994] 2009): the matrix is the higher-level constituent in which the subordinate is embedded.

The majority of (at least) bivalent verbs in SLs are so-called directional verbs (or “argument verbs” in the literature): they are specified by the fact that the movement of the sign is modified to mark the actant-agent (starting point of the movement) and the actant-patient or beneficiary (end point of the movement). For debates on this notion, see (Garcia et al. 2022).

The three space dimensions plus the temporal dimension.

Standard written French would be “l’anniversaire d’Evelyne”. Given the existence of the possessive case in English, which precisely places the possessor first, it is difficult to give an English equivalent.

This example is taken from Millet (2008).

Translation of what the main character says: “Thanks! I hated this painting!”.

The project involved seven countries: Spain, France, Iceland, Israel, the Netherlands, Sweden, and the United States. It was entitled “Developing literacy in different contexts and different languages” and was funded by the Spencer Foundation (USA).

Such a sequence of pseudo-words is difficult to reproduce in full in English, and it would be of little relevance here.

We refer here to the Common European Framework of Reference for Languages (CEFR), which organizes L2 proficiency into six levels: A1, A2, B1, B2, C1, C2.

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