Relative clauses in French Sign Language (LSF): some preliminary results

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Abstract

We report preliminary findings on the morpho-syntactic structure of relative constructions in French Sign Language (LSF). We describe two manual markers that are analyzed as d-like relative pronouns and we show that LSF has both internally and externally headed relative clauses. We offer a unified derivation for both types of relative clauses.

Keywords: LSF, relative clauses, internal head, external head, head-matching derivation

1 Introduction

The syntax of relative clauses is a well studied topic in sign language (see Cecchetto et al. (2006), Branchini and Donati (2009), Brunelli (2011) for LIS, Wilbur (2017) for a recent review on ASL, Pfau and Steinbach (2015) for DGS and Li (2013) for HKSL among others). All these studies showed that the main relativization strategies found in spoken languages are also attested in sign languages, namely externally headed, internally headed and correlatives.

In this paper we present some preliminary results on the main strategies of relativization used in French Sign Language (LSF). We show that LSF has genuine cases of relative clauses and that they can be both internally and externally headed. Relative clauses can be marked in three different ways: by using prosodic cues only (i.e., facial expressions and body postures), or by using two manual signs. One is the classifier for person, which is specific to human referents, the other is a particular kind of pointing sign and it is available for all kinds of referents. Most of the discussion will be based on relative clauses marked with this particular pointing sign that we glossed as PI.

The rest of the paper is organized as follow: Section 2 illustrates the methodology adopted to collect the data. Section 3 presents some basic facts about LSF. Section 4 contains the empirical part of the paper, while a formal implementation is offered in Section 5.

2 Methodology

The data reported in this paper come from two informants, both native signers of LSF. Laurène Loctin is 27 years old and comes from the region around Paris. Thomas Lévêque is 28 years old and comes from Bordeaux in the south west of France. They both regularly collaborate with our research group as LSF consultants.

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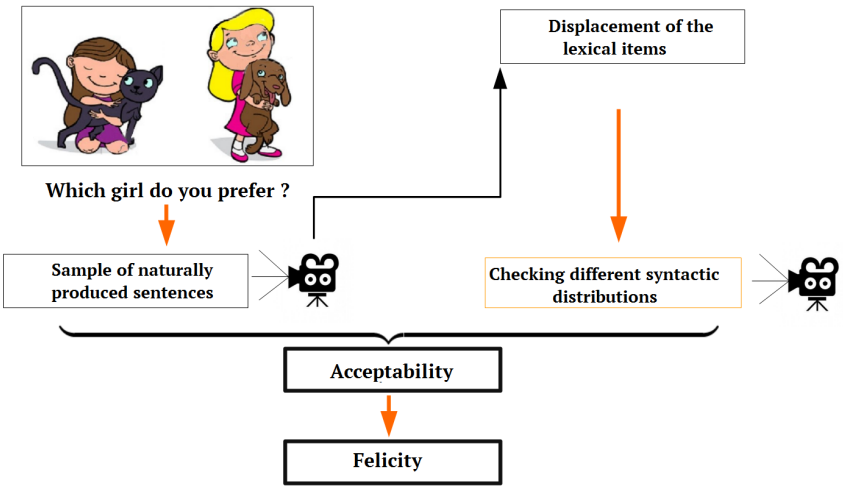
Data have been collected in two steps using various fieldwork techniques. In the first step we obtained the baseline examples by adapting tasks commonly used in language acquisition (Stegenwallner-Schütz et al. (2014); Belletti and Guasti (2015)). In the second step we manipulated word order and syntactic positions to investigate more complex structures. All data have been recorded in various sessions. Cross-validation was done by letting the informants judge each other's recordings. We always worked with one informant at a time and during all the phases of data collection LSF was the only mean of communication between the informants and the researchers.

The image in Figure 1 illustrates the various steps and substeps of the procedure. At the top left corner of Figure 1 there is an example of elicitation material displaying two girls with two different pets. After presenting the picture, we asked our informants which girl do they prefer (a similar technique has been used to elicit relative clauses in Israeli Sign Language, Dachkovsky (2016)). In the second step of the procedure, we manipulated word order and syntactic complexity, by asking our informants for instance to displace the relative marker in various positions in the sentence, or to add more lexical material to the sentence (e.g., temporal adverbs). At the end of each stage, we collected acceptability and felicity judgments on our baselines using the playback method (Schlenker (2011)).

Figure 1: *Elicitation procedure's pattern*



To offer a concrete example of our procedure, consider a relative clause on the subject in object position like the one in (1) (e.g., *I prefer the girl who is petting the dog.*). We obtained that sentence by asking our informants which girl do they prefer, after the presentation of the picture in Figure 1. In order to investigate the syntactic position of PI, we then asked our informants to simply displace PI in various parts of the sentence. The examples in (1a)-(1e) are the result of this word order manipulation. Once we recorded the video examples for each of the sentences in (1) acceptability and felicity judgments on a 7-point scale have been collected by playing back the videos to our informants.

(1) Elicited sentence:
IX-1 PREFER GIRL **PI** PET DOG

a. Directly asked alternatives :
PI IX-1 PREFER GIRL PET DOG

b. IX-1 **PI** PREFER GIRL PET DOG

c. IX-1 PREFER **PI** GIRL PET DOG

d. ...

e. IX-1 PREFER GIRL PET DOG **PI**

3 Background information on LSF

The data included in this section will be useful to frame some aspects of the internal structure of relative clauses provided in the following sections. For space reasons, we cannot offer a detailed overview about the structure of LSF and we only focus on word order and wh-questions. For word order facts, we partially replicated previous findings (see below), while for wh-questions there is no previous documentation that we know of.

Like in many other sign languages, word order is quite free in LSF. Bouvet (1996) reports SVO as the base order, while De Langhe et al. (2004) reports SOV as the basic one, although other orders are also attested. The preferred word order for our informants is SVO, as shown in (2a). OSV is also frequently attested, however, it requires at least the raising of the eyebrows over the object which is a clear mark of topic as shown in (2b) (on the OSV order in LSF see also De Langhe et al. (2004)). The SOV order is marginally possible, with the condition that, if no particular non-manuals are used on either the first or the second nominal element, the most natural reading is that of a coordinated subject with an implicit object, as indicated in the translation offered for the example (2c).

(2) a. MAN PET DOG
'The man is petting the dog.'

b. $\overset{\text{topic}}{\overline{\text{DOG}}}$ MAN PET
'As for the dog, the man is petting it.'

c. MAN DOG PET
'The man and the dog are petting something.'
?? **Intended reading**: 'The man is petting the dog.'

The most preferred strategy for asking wh-questions is to leave the wh-sign in situ (Geraci (in prep.)), a property shared with ASL (Neidle et al. (2000)). This is shown by the examples in (3a)-(3b).

(3) a. DOG SCRATCH **WHO**
'Who did the dog scratch?'

b. **WHO** SCRATCH CAT
'Who scratched the cat?'

Wh-questions will be used as a test for island (Ross (1967)).

Finally, temporal adverbs are normally found either at the beginning or at the end of the clause, as shown in (4).

(4) a. YESTERDAY DOG SCRATCH CAT

b. DOG SCRATCH CAT YESTERDAY
'A dog scratched a cat yesterday.'

The position of temporal adverbs is normally used as a reliable cue to determine the edges of a clause. This is also true for sign languages (see among others Neidle et al. (2000) and Cecchetto et al. (2006)). In the next section, we will use the position of temporal adverbs to show that LSF has clear cases of externally headed relative clauses.

4 The data

There are three different ways of producing relative clauses in LSF, at least when the head of the relative clause refers to humans. All of them involve some eyebrow raising, two of them involve the use of an overt marker, the classifier for person, glossed as PERSON-CL or a kind of pointing sign glossed as PI (see Section 4.2 for a detailed description). The relevant examples are illustrated in (5):

(5) a. IX-1 PREFER $\overline{\text{VET}}^{\text{re}}$ CURE DOG
b. IX-1 PREFER $\overline{\text{VET PERSON-CL}}^{\text{re}}$ CURE DOG
c. IX-1 PREFER $\overline{\text{VET PI}}^{\text{re}}$ CURE DOG
'I prefer the vet who is curing the dog.'

In the next sections we first look into the macroscopic properties of these constructions, and then into some fine-grained aspects of the morphological and prosodic makeup of relative clauses. For concreteness, we present only cases of relative clauses marked with PI as this marker allows a more direct identification of the properties of LSF relative clauses.

4.1 Macroscopic properties

At the macroscopic level, we have evidence that the examples in (5) involve subordination of a sentence modifying a nominal element because these constructions are wh-islands (Ross (1967)). The examples in (6) illustrate that it is possible to have matrix wh-questions with sentential complements embedded in bridge verbs. Crucially, when the wh-sign is inside the sentential nominal modifier, as in (7), neither matrix nor embedded wh-questions are possible. We take this as evidence that the constructions in (5) are genuine cases of relative clauses.

(6) a. MARIE SAY [WOMAN CUDDLE DOG]
'Marie said that the woman is cuddling the dog.'
b. MARIE SAY [WOMAN CUDDLE **WHO**]
'Who did Marie say the woman is cuddling?'

(7) a. MARIE PREFER WOMAN [$\overline{(\textbf{PI})}^{\text{rel}}$ CUDDLE DOG]
'Mary prefers the woman who is cuddling the dog.'
b. *IX-2 PREFER WOMAN [$\overline{(\textbf{PI})}^{\text{rel}}$ CUDDLE **WHO**]
Intended meaning: 'What is the animal such that you prefer the woman that is petting it?'

In terms of macroscopic structure, the pattern in (5) excludes the possibility that we are dealing with correlatives, as there is no obligatory fronting of the relative clause (see Cecchetto et al. (2006)). However, several languages allow for both externally and internally headed relative clauses, like Japanese (Shimoyama (1999)) and ASL (Liddell (1980)). This is the case of LSF too. For sake of clarity, in the next examples we also include the gap corresponding to the syntactic position of the head inside the relative clause and when needed also the relevant bracketing. In the example in (8a), the relative clause is extraposed to the right of the temporal adverb which refers to the time of the event described in the matrix clause. The head of the relative clause VET along with the marker PI is left inside the matrix clause. The example

in (8b) is a case where the head is internal since it is found to the right of the temporal adverb along with the relative marker. In this specific case, the temporal adverb refers to the event of the relative clause (prosodic and spatial information is used to determine to which event the temporal adverb refers). The examples in (8) display subject relative clauses, while those in (9) display object relative clauses.

(8) a. IX-1 PREFER **VET PI** TODAY [___*gap* CURE DOG]
'Today I prefer the vet who is curing the dog.' (...Yesterday I preferred the vet who was curing the cat.)

b. IX-1 PREFER [TODAY **VET PI** CURE DOG]
'I prefer the vet who is curing the dog today.' (...not the one that is curing the cat.)

(9) a. IX-1 PREFER **DOG PI** [MAN PET ___*gap*]
'Today I prefer the dog which the man is petting.'

b. IX-1 PREFER [MAN **DOG PI** PET]
'Today I prefer the dog which the man is petting.'

Overall, our informants have a clear preference for externally headed relative clauses, although internally headed are more or less equally fine. This is particularly evident in the case of object relative clauses where word order automatically disambiguates between the two options. Both are equally acceptable but signers have a preference for the externally headed version.

The examples in (5) are subject relative clauses in object position. However, relative clauses can also modify subjects as shown in (10).

(10) $\overline{\text{VET PI}}^{\text{re}}$ CURE DOG EAT FRIES
'The vet who is curing the dog eats fries.'

Relative clauses can be built virtually out of any constituents. We illustrate here object and adjunct relative clauses.

(11) a. IX-1 PREFER $\overline{\text{DOG PI}}^{\text{re}}$ MAN PET ___ *gap*
'I prefer the dog which the man is petting.'

b. IX-1 PREFER $\overline{\text{TOOTHBRUSH PI}}^{\text{re}}$ LITTLE GIRL PAINT ___ *gap*
'I prefer the toothbrush with which the little girl is painting.'

The example in (12a) illustrates one particular case in which the head corresponds to the entire event described by the relative clause. The relative marker PI occurs at the end of the sentence, crucially after the temporal adverb which is used to mark the right edge of the relative clause. The example in (12b) illustrates the relative clause with the overt head.

(12) a. IX-1 PREFER [VET CURE DOG TODAY] PI

b. IX-1 PREFER SITUATION PI [VET CURE DOG TODAY]
'I prefer those situations in which a vet is curing a dog today.'

4.2 Microscopic properties

At the microsopic level, LSF relative clauses are either juxtaposed or marked with the sign PI or the classifier for person, PERSON-CL. The use of PERSON-CL is limited to cases where the head of the relative clause refers to humans, as shown in (13).

(13) a. IX-1 PREFER VET PI CURE DOG
b. IX-1 PREFER VET PERSON-CL CURE DOG
'I prefer the vet who is curing the dog.'
c. IX-1 PREFER DOG PI VET CURE ___*gap*
d. * IX-1 PREFER DOG PERSON-CL VET CURE ___*gap*
'I prefer the dog which the vet is curing.'

Both markers can be used with internally headed relative clauses and show spatial agreement with the head of the relative clause. The subscript in the examples in (14) indicates that the vet's location in the signing space is used to realize both PI and PERSON-CL.

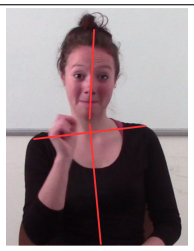
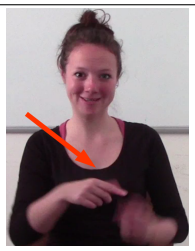
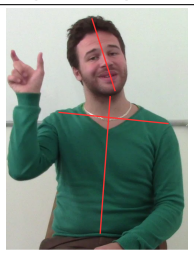
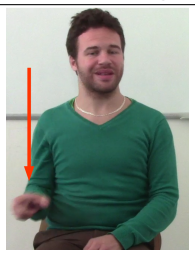
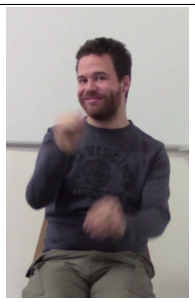
(14) a. IX-1 PREFER TODAY VET PI$_{vet}$ CURE DOG
b. IX-1 PREFER TODAY VET PERSON-CL$_{vet}$ CURE DOG
'I prefer the vet which today is curing the dog.'

The examples in (14) are also helpful in determining the morpho-syntactic status of the relative markers. The fact that they can occur inside and outside the relative clause can be taken as evidence that they are not complementizer-like elements. Furthermore, both markers can be used as independent pronominal elements, as shown in (15), strongly suggesting that even when used in relative clauses they are pronominal/d-like elements as well. For further semantic properties of PERSON-CL in LSF see Kuhn et al. (2017) and for PI see Schlenker (2017).

(15) a. IX-1 PREFER PI
'I prefer that.'
b. PERSON-CL ENTER
'Someone entered (the room).'

At the prosodic level, relative clauses normally come with a cluster of non-manuals, the most salient of which are raised eyebrows and a slight head tilt. Although we did not conduct a deep study of these prosodic features, we observed that the spreading of the non-manuals is quite limited in our examples. It co-occurs with the relative marker and sometimes spreads over the head. In the case of juxtaposed relative clauses it occurs on the head, as illustrated in the images on Table 1.

Table 1: *Manual and non-manual morpho-phonological properties of each strategy.*

 **Beginning of PI**	 **End of PI sign**
 **Beginning of PERSON-CL**	 **End of PERSON-CL**
 **Sign for VET (the head)**	 **Sign for CURE (the verb)**

5 Analysis

LSF has both internally and externally headed relative clauses which are marked by a d-like relative pronoun and can relativize virtually any constituent. The fact that the same lexical material is used to generate both kinds of relatives calls for a unified analysis. Indeed LSF data support theories of relative clauses where the head is generated inside the relative clause. The *Head-Raising Analysis* (Bianchi (2002), De Vries (2002) and Kayne (1994)) and the *Head-Matching Analysis* (Carlson (1977), Cinque (2003), Heim (1987) and Sauerland (2003)) are two of the most influential proposals of this kind. The LSF data we introduced in Section 4 are compatible with both approaches modulo some assumptions which are independently needed.

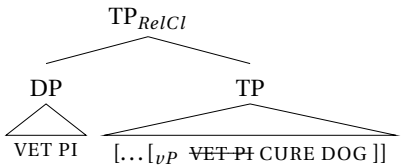
We implement here an account based on the Head-Matching Analysis. Under this approach the head and the relative pronoun are generated inside the relative clause and then moved to its edge to create the operator-variable chain. Then a DP identical to the head + relative pronoun is merged in the derivation and forces deletion under identity of the head and the relative pronoun at the edge of the relative clause. For illustration purposes, we provide the main steps of the derivation of the sentence in (5c), repeated here as (16).

(16) IX-1 PREFER $\overline{\text{VET PI}}^{\text{re}}$ CURE DOG
'I prefer the vet who is curing the dog.'

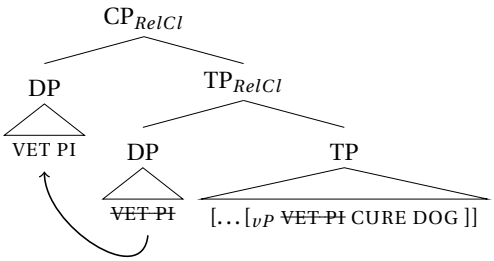
The step of the derivation in (17a) shows that the head and the relative marker PI are merged as part of the TP/vP complex of the relative clause. The step in (17b) illustrates the movement to spec,CP and deletion of the lower copy in spec,TP. The "match" DP is externally merged in (17c) and the head noun gets deleted under identity, as in (17d). The derivation further continues by merging the syntactic object created in (17d) in the complement position of the matrix verb PREFER.

(17) *Derivation of Externally Headed Relative Clauses in LSF: Head-Matching Analysis*

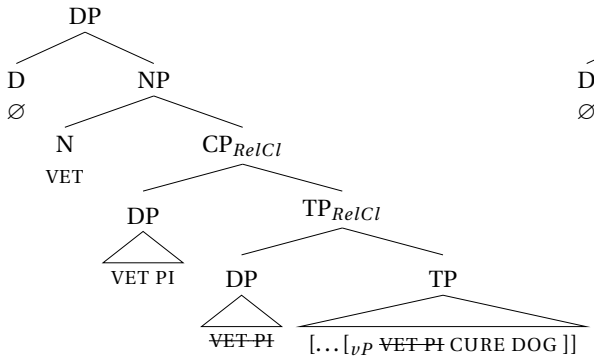
a. Head inside the RelCl



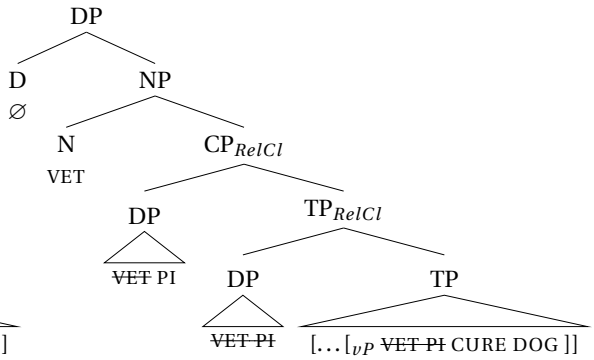
b. Movement to spec,CP



c. Merge of the Match DP



d. Head deletion under identity



The derivation of internally headed relative clauses can be done by assuming covert movement to the edge of the relative CP and then deletion of the match rather than the head (similar assumptions would be needed in order to derive internally headed relative clauses with the head-raising approach). We provide here the derivation for the example in (18). The temporal adverb now refers to the event of the relative clause and is used as evidence that the head is inside the relative clause itself.

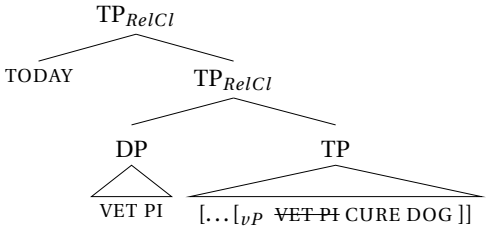
(18) IX-1 PREFER [TODAY VET PI CURE DOG]
'I prefer the vet who is curing the dog today.'

The relevant steps of the derivation are offered in (19). The step of the derivation in (19a) shows that the head and the relative marker PI are merged as part of the TP/vP complex of the relative clause, just like in (17a). The step in (19b) illustrates covert movement to spec,CP. The match DP is externally merged in (19c) and it gets deleted under identity, as in (19d). The

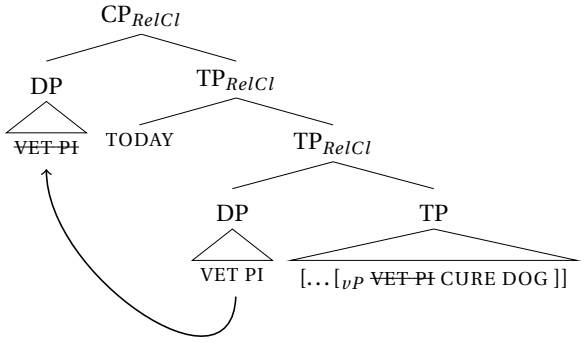
derivation further continues by merging the syntactic object created in (19d) in the complement position of the matrix verb PREFER.

(19) *Derivation of Internally Headed Relative Clauses in LSF: Head-Matching Analysis*

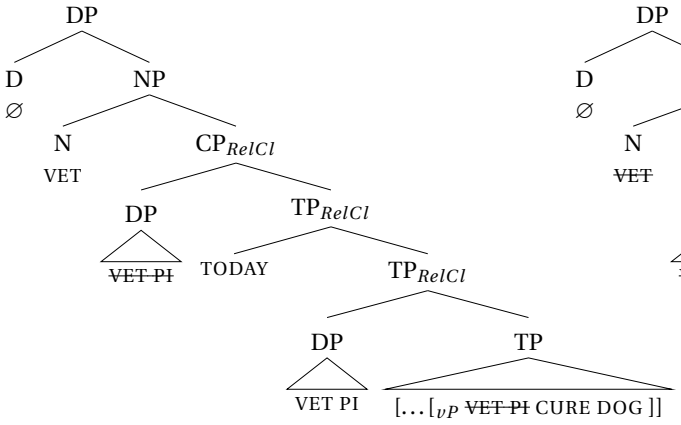
a. Head inside the RelCl



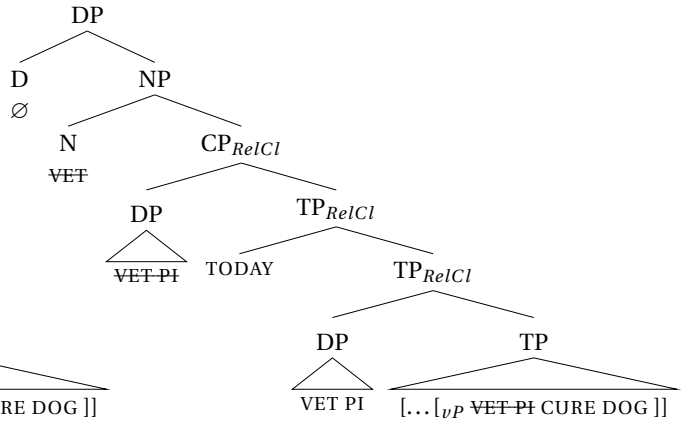
b. Covert movement to spec,CP



c. Merge of the Match DP



d. Deletion of the Match



Further research is needed to establish the fine-grained structure of the head DP and whether head and relative marker have a fixed order (especially in the case of internally headed relative clauses). Nonetheless, the derivations we offered here also account for the distribution of the relative marker. Indeed, it is introduced as part of the head DP (possibly its head) and it moves with the head along the structure. This last fact determines its spell-out position within the CP of the relative clause in externally headed relative clauses.

6 Conclusions

Relativization is one of the most widespread phenomena of the syntax of human language. It raised the attention of many researchers working both in sign and spoken languages. In this paper we provided preliminary results from LSF showing that this language has two main strategies to create relative clauses. One involves external heads, the other involves internal heads. In both cases we clearly have evidence that we are dealing with subordinate constructions, rather than juxtaposed clauses. We also described the main properties of the relative

marker PI. The data coming from LSF support theories of relative clauses in which the head is generated inside the relative clause. We implemented our analysis using one of them, namely the head-matching analysis.

These preliminary findings open the door for further research, both at the syntactic and the semantic level. It is still to be determined what the role of spatial agreement is and how it interacts with the structure of internally and externally headed relative clauses. More data are also needed to clarify the structure of relative clauses built on the event. Another domain which we didn't cover is whether the relativization process is sensitive to the morphological nature of the head. In particular, whether classifiers nouns have a special morpho-syntactic behavior in relative clauses. We hope to address all these issues in our future works.

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