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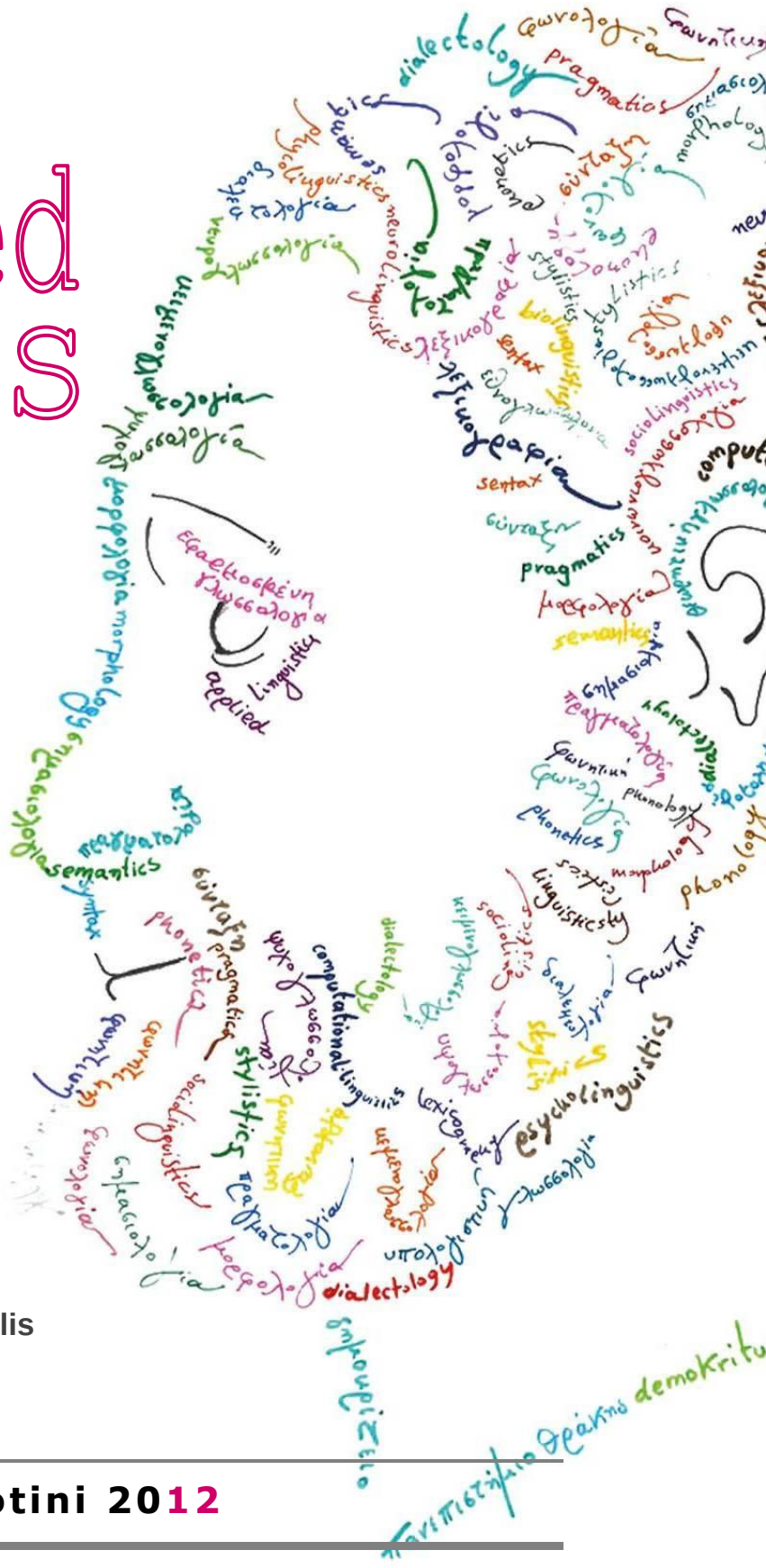

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EARLY L1 GREEK WH-QUESTIONS: SHORT- OR LONG- DISTANCE INTERPRETATION?

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ABSTRACT

This paper investigates Greek children's preference for short-/long-distance interpretation of the extracted wh-phrase in ambiguous questions. Crosslinguistic studies show that younger children resort to LD readings; older children, however, demonstrate high SD preference. To examine whether Greek children follow the same pattern, ninety 4-to-7 year-old children participated in similar comprehension tasks. The results revealed similarity to crosslinguistic findings. The younger children displayed high preference for LD interpretations, which started to give its place to SD preference as age increased. This is explained under a memory-based proposal; former proposals linking Theory of Mind and the language faculty prove to be inadequate.

Keywords: wh-questions, comprehension, short-distance, long-distance, Greek, L1

1. Introduction

The aim of this paper is to investigate the comprehension of affirmative wh-questions in Greek by typically developing children. To be more specific, what is explored is preschool-age children's distance preference in the interpretation of the raised wh-element in ambiguous questions. The main goal underlying this exploration is to see whether children's overall performance potentially reveals the operation of economy-based processing.

In order to provide answers to the above questions, reference needs to be made initially to several notions related to wh-movement, such as short- and long- distance interpretation, the Subjacency constraint and islands.

1.1 Short-/Long- Distance Wh-Movement, Subjacency and Islands

Wh-movement refers to interrogative constructions, where a wh-phrase is moved from its original position. When the wh is moved to another position within the same clause, wh-movement is known as *short-distance* (SD); when moved to a position in a different clause, wh-movement is known as *long-distance* (LD). SD and LD movement are respectively exemplified in (1)-(2) and (3)-(4) below:

(1) *Who*$_i$ *does she love* t_i*?* (English)

(2) *Wen*$_i$ *liebt sie* t_i*?* (German)
whom love-3SG she
'Who does she love?'

(3) *Who*$_i$ *do you think she loves* t_i*?* (English)

(4) *Wen*$_i$ *glaubst du dass sie liebt* t_i*?* (German)
whom think-2SG you that she love-3SG
'Who do you think she loves?'

In (1) and (2), 'who' and 'wen' move from the object position *t*i to a fronted position within the same clause. In (3) and (4), however, the fronted wh-elements 'who' and 'wen' originate from the embedded object position t_i but have moved LD to the matrix periphery.

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Focusing for a while longer on LD movement, central to its formation is the *Subjacency* constraint, which was initially proposed by Chomsky (1977) and reads as follows:

Subjacency Constraint:
The wh-phrase must pass successively through every intermediate SpecCP position before it reaches its final landing site. (Chomsky, 1977)

In later versions of the Minimalist Program, the Subjacency constraint and its cyclicity effects are captured directly by the notion of phase and its accompanying Phase Impenetrability Condition (Chomsky 1998, 1999).

Subjacency may be violated in the presence of *islands*, which are elements that block the LD raising of the wh-phrase to the edge of matrix CP. With regard to English, examples of islands are adverbial clauses ((5)), wh-islands ((6)), factivity ((7)) and negation ((8)):

(5) *Who*$_i$ *did John cry* ***[****after Bill kissed *t*$_i$***]****?* (from Boeckx, 2008)
(6) *Why*$_i$ *do you wonder* ***whether*** *John read the book* *******t*$_i$*?* (from Lasnik, 1999)
(7) *When*$_i$ *did you* ***regret*** *that you left *t*$_i$*?* (from Roussou, 1992b)
(8) *Why*$_i$ *do****n't*** *you think we can help him *t*$_i$*?* (from Rizzi, 1990)

Let us now see how SD/LD movement and islands apply to Greek.

1.2 Wh-Movement in Greek

Similarly to English, SD and LD wh-extraction in Greek is formed by fronting the wh-phrase to the matrix left periphery. (9) and (10) below exemplify these two types of extraction:

(9) *Pjon*$_i$ *ajapai* t_i?
whom love-3SG
'Who does she love?'

(10) *Pjon*$_i$ *nomizis oti ajapai* t_i?
whom think-2SG that love-3SG
'Who do you think she loves?'

Focusing for a while longer on LD movement, it is allowed in the presence of the lexical complementiser 'oti' or 'na', as illustrated in the following examples:

(10) *Ti*$_i$ *ipes oti tha dhjavasun* t_i *ta pedhja?*
what said-2SG that will read-3PL the children
'What did you say that the children will read?'

(11) *Ti*$_i$ *ipes na dhjavasun* t_i *ta pedhja?*
what said-2SG to read-3PL the children
'What did you tell the children to read?' (from Tsimpli & Dimitrakopoulou, 2007)

As for islands, again on a par with English, adverbial clauses ((12)), wh-elements ((13)), factivity ((14)) and negation ((15)) constitute islands in Greek.

(12) *Pjon*$_i$ *efije apo to domatio [xoris na xeretisi *t*$_i$*]?* (from Tsimpli, 1998)
whom left-3SG from the room without to say goodbye-3SG
* 'Who did s/he leave the room without saying goodbye to?'

(13) *Pos*$_i$ *anarotjese ti eftiakse *t*$_i$*?* (from Roussou, 1992a)
how wonder-2SG what fix-3SG
* 'How do you wonder what s/he fixed?'

(14) *Ti*$_i$ *metanjoses pu aghorases *t*$_i$*?* (from Roussou, 1992b)
what regret-2SG that bought-2SG
* 'What did you regret buying?'

(15) *Pos*$_i$ *dhen fotografizis to spiti* *t_i*?*
how not photograph-2SG the house
* 'How don't you photograph the house?'

As illustrated in the above examples, the presence of an island blocks a LD interpretation of the raised wh-element.

Having outlined basic notions about wh-movement at a theoretical level, the next section will deal with an overview of crosslinguistic child studies on question comprehension.

2. Child Studies on Question Comprehension

As stated from start, this paper focuses on the investigation of the patterns employed by children during the comprehension of ambiguous wh-questions. Early language studies have shown that when provided with a story context that makes salient both a SD and a LD interpretation of the raised wh, the younger children most often resort to the LD reading; the SD reading is the preferred choice for the older ones. Examples of such studies are those by de Villiers et al. (1990, 2007) and by Abdulkarim et al. (1997), where, in ambiguous questions like (16) and (17) below, the tested children showed preference for a LD over a SD answer:

(16) *Why did the boy say he took a bath?*
because his sister asked him – SD answer
because he was dirty – LD answer

(17) *When did the boy say he hurt himself?*
in the evening – SD answer
in the afternoon – LD answer

This pattern of responses seems to be rather counter-intuitive. For its explanation, two related accounts have been put forward. According to de Villiers et al. (1990), younger children have not yet mastered all the subcategorization possibilities of verbs. As a result, they are not able to analyze the embedded clause as a complement of the matrix verb (e.g. of 'say') but most probably as the real clause in need of an answer; hence, LD interpretations of the fronted wh arise. In a more recent account, de Villiers et al. (2007) proposed that younger children lack a Point of View (PoV) feature projection from a matrix mental or communication verb; due to this lack, they cannot defer transfer of the edge feature to a later phase but can only interpret it locally within the first phase. In other words, the fronted wh-element is linked with the embedded rather than with the matrix verb.

3. The Present Study

3.1 Predictions

In view of previous research, the prediction formulated with regard to Greek children's comprehension of ambiguous wh-questions was the following:

Prediction:
a. Preference for LD interpretations in the younger ages
b. Increasing preference for SD interpretations in the older ages

In other words, the comprehension preference pattern that has been attested crosslinguistically and that has been explained in terms of children's attempt to interpret movement locally (de Villiers et al., 2007), is expected in the Greek comprehension data as well.

3.2 Participants

The study group consisted of ninety typically developing children aged 4;0 to 7;0. For the analysis of the data, these children were divided into three equivalent subgroups A, B and C. Group A included

thirty children between four and five (mean age range: 4;6), group B thirty children between five and six (mean age range: 5;5) and group C thirty children between six and seven years old (mean age range: 6;7). Group A and B children were in their first and second year in kindergarten respectively, while group C children attended the first grade in primary school.

3.3 Materials and Procedure

The children participated in a task that was designed along the principles of McDaniel et al. (1996) and Crain & Thornton (1998). The task consisted of six short stories that replicated scenarios used in similar studies in other languages (e.g. Roeper & de Villiers, 1992; Thornton & Crain, 1994; de Villiers et al., 1990). All six stories were followed by comprehension questions; with more specific reference to the test questions accompanying each story, these were wh-COMP (2 subject, 2 object, 2 adjunct) questions that were ambiguous between a SD and a LD interpretation, with both choices being grammatical. Given the story context each time, all interpretations were made salient, while there was no issue of bound variable possibility. Finally, to preclude a bias for one interpretation over the other, care was taken to deliver all test questions in as neutral intonation as possible.

Here is a sample of the short stories presented as well as of the test questions set.

1st story (*English translation*)
The dog has a ball. The cat and the rabbit have to climb up a wall to see who has the ball. The cat tries first: she takes a ladder and tries to climb up the wall but eventually falls down. Then the rabbit tries: she uses the same ladder, climbs up the wall and sees the dog. Then she says: "I can see who has the ball! The dog has it and he is holding it with his legs!"
Experimenter's question: *Pjos$_{i/j}$ **t$_i$** emathe oti **t$_j$** ehi ti bala?* (subject-COMP)
'Who$_i$ **t$_i$** found out that she has the ball?' – SD reading
'Who$_i$ did she find out **t$_i$** to have the ball?' – LD reading
Target answer: *to kuneli* 'the rabbit' – SD reading
o skilos 'the dog' – LD reading

2nd story (*English translation*)
The child is eating something. The cat and the rabbit cannot see because the child is in the room. So, they try to find a way to see from the window. The rabbit tries first, but she does not manage to see because the window is too high. Then the cat tries. She jumps very high and says: "I can see what the child is eating! She is eating a tomato and she is eating it with great delight!"
Experimenter's question: *I jata ti$_{i/j}$ idhe **t$_i$** oti troi **t$_j$**?* (object-COMP)[1]
'Who$_i$ did the cat see **t$_i$** to be eating?' – SD reading
'What$_j$ did the cat see that the child was eating **t$_j$**?' – LD reading
Target answer: *to pedaki* ('the little child') – SD reading
domata ('tomato') – LD reading

3rd story (*English translation*)
Alex likes climbing up trees. One afternoon, he tries to climb up a tree but he fell down. Then he went back home; he took a shower and saw a big bruise on his arm. In the evening he said to his dad: "I got hurt in the afternoon".
Experimenter's question: *Pote$_{i/j}$ ipe **t$_i$** o Alexis ston patera tu oti htipise **t$_j$**?* (adjunct-COMP)
'When$_i$ did Alex say t_i to his dad that he got hurt?' – SD reading
'When$_j$ did Alex say to his dad that he got hurt t_j?' – LD reading
Target answer: *to vradi* (' in the evening') – SD reading
to apojevma ('in the afternoon') – LD reading

Each child was tested separately in a room next to their classroom. The duration of this task was about 25 minutes. After an explanation of the procedure to follow, each of the six stories was acted out

[1] Unlike subject and adjunct, in object questions the wh-element did not appear sentence-initially. The reason is that in argument questions the aim was to locate the wh-element as close as possible to the two extractions sites available (SD-LD). Thus, in object questions the subject appeared sentence-initially, so as not to intervene later on. Adjunct extraction sites were more easily traceable, so this restriction was not considered for adjunct questions.

with props in front of the child or presented through pictures to her. At the end of each story, the comprehension question was posited, with the aim to see which reading – SD or LD – the child would prefer. In case the child did not respond to a certain test question, this question was repeated once; if no answer was elicited, the procedure proceeded with the presentation of the next story and its accompanying question.

4. Results and Discussion

The main prediction in this paper is that, during the comprehension of ambiguous questions, the younger children will mostly resort to LD readings, while SD readings will start to become more preferred with an increase in age. This prediction is largely confirmed by the obtained results, as illustrated in the following figure:

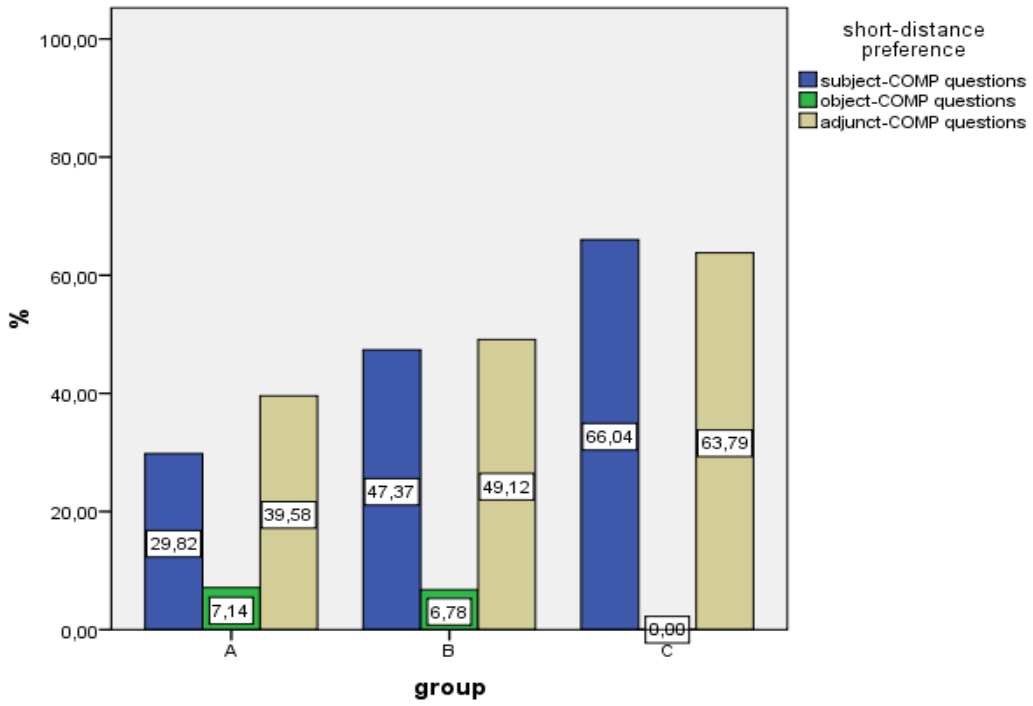

Figure 1 Short-Distance Preference per Extraction Site in Question Comprehension

In subject and adjunct questions, SD interpretations ranged at similar levels - especially within groups B and C - and became increasingly higher with age. As for object questions, SD rates were extremely low in the two younger groups and null in the oldest group, thus contrasting with the corresponding rates in subject and adjunct questions. These observations are also supported statistically. A two-way mixed ANOVA was performed on the results: question type (3) ¥ group (3). The main within-subject effects of question type [F(2,174)=48.973, p=.000] and of question type by group interaction [F(4,174)=3.433, p=.01] were both significant. In addition, the main between-subject effect of group was also found to be significant [F(2,87)=6.940, p=.002]. Within all three groups, pairwise comparisons revealed significant differences in terms of SD interpretations between object and subject (A: p=.005, B: p=.000, C: p=.000) as well as between object and adjunct questions (p=.000), but not between subject and adjunct ones. Between groups, SD reading rates increased significantly between B and C in subject questions (A-C: p=.001, B-C: p=.053) and gradually across groups in adjunct questions (A-C: p=.035). On the contrary, in object questions no significantly different comparisons were attested since SD reading rates remained at very low levels throughout. On the whole, subject questions seem to pattern together with adjunct questions, both of which come in contradistinction with object questions.

As reported in section 2, evidence of children's initial preference for LD over SD interpretations in globally ambiguous questions has also been observed in other early languages, like early English and early Arabic (de Villiers et al., 1990; Abdulkarim et al., 1997; de Villiers et al., 2007). Subject and

adjunct early Greek questions pattern together with wh-interrogatives in other early languages, whereas object ones do not. This 'deviation' may be attributed to lexical reasons and, more concretely, to properties of the object-extracted wh-phrase 'ti'. That is, all object questions employed the wh-word 'ti', which carries the [-animacy] feature; on hearing 'ti', then, children would immediately build a structural representation of the input string that relates 'ti' with the LD inanimate referent rather than with the SD animate one. On this ground, no firm conclusion can be drawn about distance preference in object questions, but only about subject and adjunct questions.

Overall, then, object questions aside, the results of the present study showed that SD interpretation rates were generally low but increased with age. As explained in section 2, the two proposals that have been put forward crosslinguistically in order to account for this rather counter-intuitive pattern were related to an incomplete inventory of verb subcategorization properties (de Villiers et al., 1990) or to a lack of a PoV feature projection (de Villiers et al., 2007). However, these explanations do not seem to be very satisfactory. Given that the PoV feature is assumed to project from mental and communication verbs, it is clear that it is directly related to the Theory of Mind. The Theory of Mind has been found to interact with the faculty of language (e.g. Happé, 1995; Garfield et al., 2001; Brent et al., 2004; Hughes et al., 2005); still, as revealed through studies on mental/language disorders (e.g. autism, Asperger syndrome, agrammatic aphasia), the Theory of Mind and the faculty of language are independent from each other and may stand in a relationship of double dissociation (e.g. Happé, 1991; Smith & Tsimpli, 1995; Tsimpli & Smith, 1998; Varley & Siegal, 2000; Smith et al., 2003). On the basis of all this, it can be argued that the encoding of a PoV feature projection in grammar would need independent justification that would subsequently lead to reduction of the explanatory power of language. Thus, the PoV account is rejected in the present paper over an alternative proposal that may probably be linked to memory considerations.

Specifically, younger children's LD interpretation preference may be attributed to the fact that due to their limited working memory capacity, children ignore the matrix verb as parenthetical and consider the embedded clause as the one and single question needing an answer. These working memory limitations may reside largely at a semantic level. That is, the greater semantic saliency associated with the embedded activity predicate (e.g. 'troo' ['eat']) compared to the matrix perception/communication predicate ('matheno' ['learn'], 'vlepo' ['see'], 'leo' ['tell']) may trigger the treatment of the matrix verb as parenthetical and of the embedded one as the true question. Therefore, although interpretation is in this sense completed locally, children essentially answer LD to the initial wh-element. Older children with an increased memory will not ignore the matrix verb on semantic saliency grounds and, therefore, they may prefer to link the extracted wh-element with it in an attempt to establish the shortest wh-chain possible (cf. Theophanopoulou-Kontou, 1991).

5. Conclusions

In conclusion, this paper has dealt with the L1 comprehension of ambiguous wh-interrogatives. The results revealed that increase in age goes hand in hand with increase in children's preference for SD readings of the extracted wh-phrase[2]. As has been explained in the previous section, even younger children's more prominent resort to LD readings constitutes a local processing strategy for them. On the basis of these observations, more generalised conclusions can be drawn about the fundamental question shaped at the beginning.

It is evident that, on a par with their peers crosslinguistically, Greek children aim to a maximum degree of locality during the comprehension of wh-interrogatives. Preference for locality attests, in turn, for preference for economy-based processing. What is essential to underline here is that this economy-based processing is not triggered exclusively on syntactic grounds. As suggested by the distance preference pattern in object questions and by the role of verb predicate semantic saliency in subject and adjunct questions, semantic factors also seem to affect processing. Thus Jakubowicz's (2005) Derivational Complexity Hypothesis, according to which less complex derivations are correctly spelled out at the PF interface before more complex ones during language development, can be seriously challenged. Children's processing ability may have problems not at the level of form (as suggested by Jakubowicz's Derivational Complexity Hypothesis) but at the level of meaning integration. In other words, economy-based processing in children seems to be constrained by a combination of syntactic and semantic factors.

[2] Remember that object questions do not follow a similar pattern. Yet, they are excluded from the above generalization on the assumption that their divergent behaviour is largely due to the inherent properties of the questioned wh-element and not to its extraction site.

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