Parsing Preferences in Structurally Ambiguous Relative Clauses: L1 vs. L2

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Abstract

The present study attempts to investigate parsing preferences (early vs. late closure) of native and L2 learners of both English and Persian when they read ambiguous relative clauses. The purpose is to find out if L2 learners process L2 linguistic input in the way monolingual speakers of that language do. The participants took tests including 10 test sentences plus 10 distractors, each followed by a comprehension question. Monolingual speakers of Persian and English were provided with tests in their own language, while bilinguals were provided with tests in their second language. Results showed a significant preference of monolingual Persian speakers for high attachment to relative clause (early closure), whereas monolingual English speakers showed a high preference for low attachment (late closure). The results also indicated that bilinguals adopted the same parsing strategy used in their L1, suggesting that their L1 might be influencing their L2 processing. The results are discussed in terms of the implications they may have for ultimate attainment in L2.

Key Words: parsing preferences, ambiguous relative clauses, early vs. late closure, high attachment vs. low attachment, parsing strategies in L1 and L2, monolingual English and Persian speakers, bilinguals

Introduction

Sentences with a relative clause following a complex noun phrase (NP), like Someone shot the maid of the actress who was on the balcony, are ambiguous between two interpretations, one in which the maid is on the balcony, the other in which the actress is on the balcony (Gilboy, Sopena, Clifton, & Frazier, 1995).

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Cuetos and Mitchell (1988) contended that Frazier's late closure strategy presupposes that the relative clause *who was on he balcony* should be interpreted as modifying the NP currently being processed, i.e., *the actress*. However, some of the questionnaire and self-paced reading suggest some contradictions between different languages; native Spanish readers prefer to interpret the ambiguous relative clause in Spanish sentences as modifying the first NP, the maid (62% NP1 choice), while British English readers prefer to interpret the relative clause as NP2 modifier (only 37% choice of NP1). So they proposed that principles such as late closure could not be universal and are subjected to further studies.

To give more explanation and provide the latest studies in this area, a complete description of complex NPs containing relative clauses will be presented, which have the form NP1- preposition-NP2-relative clause, different types of NPs and also the principles with which these phrases are analyzed.

NP1 – Preposition – NP2 – Relative Clause

In the phrase of the form NP1-preposition-NP2-relative clause, which is the focus of this study, various thematic domains are possible (Gilboy et al., 1995). One possibility is that NP1 assigns a thematic role to NP2. In this case the entire NP1-preposition-NP2 complex is the thematic processing domain within which the relative clause (RC) is interpreted; both NP1 and NP2 could be the hosts for the RC, and other factors determine which is chosen. Another possibility is that the preposition assigns a thematic role to NP2, which

is then the preferred host for the RC; in other words, preposition and not NP1 is the most recent thematic role assigner.

Another principle, which might specify the more preferred host, is the role of "Referentiality". A relative clause is used to give explanation about the intended referent of the NP. Therefore Gilboy et al. (1995) propose that parsers prefer hosts that are "referential", i.e., they introduce or refer to a discourse entity. So it is assumed that if a determiner introduces the head noun of an NP, it must be related to a discourse entity. Therefore, if an RC is associated with two NPs existing within the thematic processing domain, the one (NP), which is with a determiner, will be a more preferred host for the RC.

Different Types of NPs

Gilboy et al. (1995) have identified three major categories of NP1-preposition-NP2-relative clause phrases. First a short definition of each category is provided, and then type B is elaborated, as it is the focus of this study.

Type A. In this type of phrases, NP2 lacks a determiner, therefore NP2 is generally nonreferential in these constructions. Two subcategories are identified: substance NPs, like "a sweater of wool"; and quantity NPs, like "a cup of sugar".

Type B. This class of phrases is called "genitive NPs" which specifies a form of noun having a relationship of possession or origin between one thing and another. Type B subcategories include kinship relations, like "daughter of x", functional/occupational relations, like "assistant of

x", possessive relations, like "museum of the city" with two inanimate nouns, inherent possessives, like "side window of the plane", representational NPs, like "picture of x", and alienable possessives including one animate noun, like "book of the student".

Type C. This class of NPs contains the preposition "with" which is a restrictive modifier and also a thematic role assigner. Thus, when the relative clause occurs, the current processing domain will contain only NP2 since the PP dominating the preposition will define the domain. In these cases, NP2 will be expected to associate with the relative clause.

Type B: Genitive NPs

The focus here will be on type B phrases. In type B genitive NPs, NP2 might be analyzed as an argument not adjunct of NP1 introduced by the case-marker "of" which does not assign any thematic role of its own. Since NP2 does not act as the adjunct but as an argument, NP1 and NP2 fall within the same theta-domain and NP1 will be the last theta assigner. On the other hand with true possessives with animate NP2s, NP2 behaves as a non-argument of NP1. Instead it is an argument of the preposition "of", which assigns NP2 the thematic role "possessor".

In this study, kinship relation and functional/occupational relation items of genitive NPs are selected. In these subcategories, NP2 is analyzed as an NP1 argument. Thus, according to construal principle, a relative clause will be associated with the last thematic processing domain (i.e., both NP1 and NP2). Since both noun

phrases within the processing domain are referential (according to referentiality principle), they could be available to be the host of the relative clause. On the other hand, according to recency principle (i.e., late closure strategy) the relative clause should be associated with the NP, being processed currently (i.e., NP2). Considering all these possibilities, there should be no clear preference for either one: recency favours one, discourse prominence favour the other. Attempt is made to see whether any of these assumptions is more acceptable, and if yes, whether we can extend and apply it to other languages as well (Persian in this case).

Ambiguous Persian Relative Clauses

In Persian, relative clauses are usually introduced by the relativizer *ke* (that), which is used regardless of the animacy, gender or function of the head noun; in other words, relative pronouns such as "who", "which", "whom", do not exist in Persian. It is also not possible to precede the relativizer by a preposition as in the English examples "to whom" and "in which" (Megerdoomian, 1997).

Persian relative clauses used in this study have the phrase form of NP1-NP2-RC, which is the exact translation of its English counterpart (NP1-of-NP2-RC). However, the noun phrase and the relative construction are different from their English counterparts in some ways. In the following paragraphs some important characteristics of Persian noun phrases and relative clauses are identified.

Megerdoomian (1997) defines "Standard NP" in which the head noun can be followed by the

modifiers in a noun phrase. The elements preceding the head noun are the determiner, the numeral constructions and the quantifiers.

Although adjectives always follow the noun, the superlative adjective can only appear before the head. Numerals, quantifiers and superlative adjectives are in complementary distribution; if one of these elements is present, the others cannot appear within the NP. Since complementary distribution usually indicates that the lexical elements occupy the same position, the numeral, quantifier and superlative constructions are all placed under the specifier category. The relative ordering of the constituents of the simple NP is as follow:

NP $\rightarrow$ *determiner specifier* head *modifier*

Another characteristic of NPs is ezafe (EZ) particle-e (-ye after vowels), which links nouns to their modifiers and possessors (Ghomeshi, 1997). In other words, this element joins the Persian noun phrase constituents to each other. The ezafe, however, is usually pronounced as the short vowel /e/ and is therefore not marked in written text and this might result in a series of consecutive nouns without any overt links in Persian written text as shown in following examples:

ketab-e dust-e   Ali

book-EZ friend-EZ-Ali

"Ali's friend's book"

dokhtær-e ziba

daughter-EZ beautiful

"beautiful girl"

in which -e is not marked by any written element in Persian.

   The Persian relative construction is also

different from its English counterpart in three different ways (Karimi, 2001). First, there is a relative particle -i attached to the head noun in Persian, while English lacks such a particle. Second, as mentioned before, there is no relative pronoun in Persian, and the relative clause is always introduced by the only relative complementizer ke.

ketab -i   ke ruye miz bud

book-REL that on   table was

"the book that was on the table"

Finally, Persian does not have a definite article equivalent to "the"; thus the determiner an (that or the) can occupy its position as illustrated below:

an ketab -i ke   ruye miz   bud

the book-REL that on   table was

"The book that was on the table"

However, no meaning difference exists between the above two examples.

In this research, subjects are provided with some NP1-NP2- relative clause phrases (type B, kinship and functional) which are the translations of their English counterparts. In these phrases, NP2 consists of the determiner an (the) plus the head noun without an ezafe -i, since it is assumed that by adding a relative particle the ambiguity of the phrase would be removed to some extent.

khedmætkar-e an   honaerpishe ke   ruye balkon bud

servant-EZ   the actress   who on   balcony was

"the servant of the actress who was on the balcony"

It should be noted that by removing the ezafe -i, from the end of honarpishe, the relative clause is

more likely to be attached to NP1 rather than to NP2, i.e., this might make the high attachment possibility stronger.

Cross-Language Variation in Structurally Ambiguous Relative Clauses

Frazier (1978, 1987, cited in Ferreira & Henderson, 1991) has proposed that the parser uses the principle of late closure to resolve the ambiguity. Late closure, minimal attachment and other principles are different parts of Frazier's garden-path theory which aims to explain how the parser computes the initial analysis of a sentence based on a short-time memory economy condition.

A strong claim about human sentence comprehension is that the processing mechanism is fully innate (Frazier & Fodor, 1978, cited in Fodor, 1998). Thus, it can be concluded that the parsing device owns fundamental design characteristics that attribute all parsing strategies to a single least-effort parsing tendency: "Minimal Everything". This leads us to the issue of universality of the parsing, i.e., the parsing mechanism can be fully universal and innate.

However, this whole explanatory program is in danger because of the discovery that late closure is not universal. Many studies in psycholinguistics are concerned with the way attachment ambiguity is handled in different languages. In some languages such as Dutch, French and German, early closure relative clause attachment is preferred, i.e., parsers prefer to attach items to a new constituent, while in some others, they prefer late closure such as in Italian and English (Carreiras, Betancort, & Meseguer, 2001).

The results of an off-line pilot study by Maia and Maia (1999), which tested the preferred processing strategy of Portuguese and English speakers facing ambiguous relative clauses such as *Someone shot the servant of the actress who was on the balcony*, confirmed the fact that there are cross-linguistic differences in the syntactic processing of sentences and that those who were not bilingual showed different preferences suggesting a possible interaction between the strategies in the bilingual mind. The study showed that the preference for the low attachment of the relative clause (late closure, that is, "actress") which is clear in the case of monolingual English speakers, is not instantiated in the L2 English spoken by native Portuguese speakers, who did not display a significant preference to attach low, probably due to an influence of the processing strategy dominant in Portuguese, the early closure. Likewise, the study also indicated the effect of the English processing strategy, late closure, on Portuguese by comparing the attachment preferences of monolingual Portuguese speakers and L2 Portuguese spoken by native English speakers. Thus, the results suggest that L1 processing strategies may become solidified and influence the processing of L2 input.

In the study conducted by Gibson et al. (1996) new evidence is provided from Spanish and English self-paced reading experiments on relative clause attachment ambiguities that involve three possible attachment sites. In Experiment 1 the attachment preferences in Spanish RC, attachment ambiguities are examined by providing Spanish phrases (NP1-preposition-NP2-preposition-NP3-RC) such as:

las lámparas cerca de las pinturas de la casa que fue denanda en la inundación.
"The lamp near the painting of the house that was damaged in the flood."

The results indicated that Spanish-speaking subjects have less difficulty with low attachments (to NP3) than with either middle (NP2) or high (NP1) attachments (contrary to the study conducted by Gibson and Pearlmutter (1998) in which NP1 is preferred over NP2 in two-site ambiguous Spanish relative clauses), and high attachments are in turn easier than middle attachments as soon as they were forced by syntactic agreement constraints ("the lamps near the paintings of the house that were damaged in the flood" in which only NP1 and NP2 can be the hosts of the relative clause, since the verb is plural). Experiment 2 supports the finding of the first experiment by examining the English version of the same sentences using English-speaking subjects. Experiments 1 and 2 provide strong support for a principle like late closure and suggest that in fact this principle is universally operative in the human parser, but that it is controlled by at least one other factor in the processing of relative clause attachment ambiguities. Gibson et al. (1996) suggest that the second factor involved in the processing of these constructions is the principle of "Predicate Proximity", according to which attachments are preferred to be structurally as close to the head of a predicate phrase as possible.

Gilboy et al. (1995) investigate Spanish and English readers' interpretations of sentences with complex noun phrases such as "I really liked the preface of the book that I read yesterday". These complex NPs are ambiguous between two readings, one in which the relative clause "that I read yesterday" modifies the first noun "preface", or the second noun "book". Some researchers claimed that Spanish was biased toward having the RC modify NP1, which they claimed was evidence against the cross-language universality of the late closure parsing principle. However this study demonstrates that the preference for NP1 vs. NP2 varies greatly between different construction types within both Spanish and English while the variation between languages is relatively minor, but still of interest. This can be the effect of certain syntactic and semantic aspects of the constructions studied. They claim that relative clauses are not parsed based on the late closure principle; rather they are parsed following principles such as "Construal" and "Referentiality" principle. To examine the effect of these principles subjects were presented with questionnaires (Spanish version to Spanish-speaking subjects and English version to English-speaking subjects) of nine distinct types of critical items and were asked to make a quick judgment as to what it meant, reading two or three options under each sentence. The construal principle predicted that NP2 interpretation should be preferred when NP2 is not an argument of NP1, namely, in type B NPs (with animate possessors, e.g., "the book of the student") and in type C NPs (containing "with", e.g., "steak with the sauce"). This prediction was confirmed both in English and Spanish with more NP2 responses in English. It is also predicted that NP1 interpretation should be available when NP2 is an argument of NP1, such as type B NPs (e.g.,

"relative of the boy"). This prediction is also confirmed: approximately 50% NP1 and 50% NP2 interpretations for both Spanish and English, consistent with the claim that both NP1 and NP2 are available as a host for the relative clause, however Spanish showed significantly more NP1 choices than English, but the difference between languages in frequency of NP1 choices is far less considerable than the difference reported by Cuetos and Mitchell (1988, in Gilboy et al., 1995). Finally, the referentiality principle predicted that NP2 should be relatively unavailable to host the relative clause in type A NPs (substance or quantity readings, e.g., "sweater of cotton"), where a determiner did not introduce NP2. This prediction, too, was strongly confirmed in both English and Spanish. In sum, this study shows that it is not the case that late closure is a language-specific strategy; rather it and other structural parsing principles are specific to only certain classes of phrases within a language.

Fodor (1998) argues that early closure in Spanish and other languages is observed only in one construction: an adjunct with ambiguous attachment in a complex NP (e.g., "the servant of the actress who was on the balcony"). She believes that this construction shows borderline effects in English too. For other constructions, low attachments are preferred in all languages tested. What is it about the complex NP construction that favors high attachments? Fodor assumes that an important factor is the length (heaviness) of the attachee relative to that of the host construction: their weight needs to be balanced. A relative clause is a heavy attachee and the second (lower) NP is

usually too small (in right-branching language) to be an ideal host. If the whole complex NP is the host, it is better balanced against the relative clause by the principle that a constituent likes to have a sister of its own size.

In a paper by Papadopoulou and Clahsen (2002), the results from acceptability judgment and self-paced reading experiments were reported; they examined relative clause attachment preferences of Greek native speakers. These results revealed a consistent picture showing that lexical and/or thematic properties of the antecedent affect the attachment of the RC, i.e., there is no absolute tendency for one of these attachments.

Another factor that can affect the preference is the language of instruction; in an experiment, Adams and Hoshino (1998) investigated the impact of the language of the instruction to see which parsing strategy is used by bilinguals in L2. Twelve Japanese-English bilinguals were provided with sentences printed in English. Native Japanese speakers preferred the typical native-English late closure strategy and were more likely to make late closure responses, when instructed in English. In contrast, when instructed in Japanese, readers were more likely to make early closure responses. These results suggest that when discourse clues are absent in the written text, the context of the environment (here the language of instruction) could guide sentence processing.

This Study

This study aims at finding a clear-cut answer to the question whether bilinguals process L2 linguistic input in the way monolingual speakers of the target

language do. The results may suggest that L2 cannot be directly processed without interference and interaction of parsing strategies employed in learners' L1. Such a finding is of significance because it will shed some light on problems related to ultimate attainment. If it is found that learners employ the same processing strategies which they use in their L1, it can be concluded that it is not just linguistic differences between learners' L1 and L2 that might cause problems; rather processing differences, too, can be an obstacle to native-like achievement in L2.

Another significance of this study is to assess various parsing strategies used to resolve the ambiguities encountered by the readers. There have been several principles and strategies proposed for handling ambiguities, some of which have been claimed to be universal and innate; therefore the present study also seeks to investigate whether there is a cross-language applicability of various parsing principles. To do so, parsing preferences of English and Persian monolinguals will be compared and analyzed.

Research Questions

This work aims to provide answers to the following questions:

Is there any difference in terms of the preference of low attachment of the relative clause (late closure) between monolingual English and Persian parsers?

Is there any difference in terms of the preference of low attachment of the relative clause (late closure) in English sentences between monolingual English and bilingual Persian parsers?

Is there a difference in terms of the preference of the low attachment (late closure) in Persian sentences between monolingual Persian and bilingual English parsers?

Participants

A total number of one hundred and five subjects, comprising four groups aged between 18 and 35, participated in this study. Groups I and II were all Persian and English monolingual speakers. Group I contained thirty female monolingual Persian speakers with no or little knowledge of English since they were all placed at the basic level of Kish Language Institute. Group II included twenty-two monolingual native English speakers, ten males and twelve females, with no knowledge of Persian. They were all American students, 16 of them studying at College of Marine, CA, ranging from freshmen to post-graduates. Groups III and IV were bilingual speakers of English and Persian. Group III contained thirty female native Persian speakers whose second language was English. Group IV were twenty-one female English-Persian bilinguals whose first language was English. Subjects of both groups III and IV started learning their second language between the ages 10 and 13 being considered as late learners, since puberty is commonly considered as critical period for language acquisition (Penfield & Roberts 1959, cited in Ellis, 1994). Regarding L2 proficiency of group III, the subjects were all English teachers in Kish Language Institute, therefore, displaying a good command over the language. They were chosen as teachers by the Institute after passing a

TOFEL test scoring above 550, an advanced interview and attending TTC (Teacher Training Course) classes. The subjects in-group IV learned Persian during extensive stay in Iran and they either graduated or studied in the last grade of a high school in Iran. The school is called "Mojtame

Beinolmelal" which is specialized for those who move to Iran from other countries.

A brief description of participants' characteristics is shown in Table 1.

Table 1 A description of the characteristics of the four groups

	L1	L2	N	Male	Female	Test
Group I	Persian	------	30	-----	30	Persian
Group II	English	------	22	10	12	English
Group III	Persian	English	30	-----	30	English
Group IV	English	Persian	21	-----	23	Persian

Materials

A test of 20 items (adapted from Maia & Maia, 2002), printed in both English and Persian, containing 10 distractors --unambiguous sentences with varied syntactic structures-- and 10 test sentences, each followed by a comprehension question, was given to the participants. The test sentences included structurally ambiguous relative clauses with two types of NP1-preposition-NP2-relative clauses. The first type, type B (kinship) items of genitive NPs, included examples such as:
John met the friend of the teacher who was in Germany.

With regard to the comprehension question: Who was in Germany? Either the friend or the teacher can be the possible answers and can serve as the host for the RC. The second type, Type B (functional/occupational) items of genitive NPs included examples such as:
Someone shot the servant of the actress who was

on the balcony.

Here, both *the servant* and *the actress* can be available as possible hosts for the RC, and the possible answers to the comprehension question *Who was on the balcony?"*

The Persian version of the test used in this study has the phrase form of NP1-NP2-relative clause which was the exact word for word translation of the English items except for some of the names which were changed to common names in Persian.

Procedure

The subjects were given typed sheets containing the 20-item test. They were asked to answer the questions related to the sentences based on their intuition. It was made clear to them that there was not a single patterned answer to the questions and that their performance would not be judged. Groups I and IV were presented with the Persian

version of the test, while groups II and III were presented with the English version of the test. Subjects took the test either individually or in a class following a self-paced procedure. In the case of group II – monolingual American-English native speakers – six of the subjects took the test through e-mail. The instructions for the test were provided in the language of the test in written

form. Before starting the test some samples were provided to make sure the subjects know what they are required to do.

Data Analysis

The percentage of parsers' preference of early versus late closure was computed for each group and is presented in Table 2.

Table 2 Percentage of parsers' preference for early and late closure

	Persian Monolinguals	English Monolinguals	Persian Bilinguals	English Bilinguals
Early Closure	81%	25.4%	86.7%	24.3%
Late Closure	15.3%	72.3%	13.3%	58.1%
Void Data	3.7%	2.3%	0.0%	17.6%

As indicated above, the data confirmed the predictions in terms of L1 influence on L2 parsing. Persian monolinguals' data showed that 81% of the answers were in favour of EC and only 15.3% in favour of LC, with 3.7% of void data (the questions which were answered either both EC and LC or nothing). English monolinguals also met the expectations based on the literature: 72.3% of the answers showed preference for the low attachment of the relative clause (LC) and only 25.4% for the high attachment (EC), with 2.3% of void data. Persian bilinguals who were presented with English tests, answered with 86.7% in favor of EC and 13.3% in favor of LC with no void data. English bilinguals presented with the Persian version of the tests answered with 24.3% in favor of EC and 58.1% in favour of LC and 17.6% of void data. From the data it can also be inferred that

bilingual groups, taking the test in their second language, used the same parsing strategy employed in their first language. Persian bilinguals' preference, in the English test, is for the EC that is the dominant strategy used by Persian monolinguals in the Persian test. This is also true for English bilinguals taking the Persian test. Their preference is for the LC that is the dominant strategy used by English monolinguals in the English test. To check the significance of all these differences, the following statistical analyses were run.

Comparison 1: Persian and English Monolinguals
Based on research question number 1, the following null hypothesis was tested: "There is no difference between English and Persian monolingual parsers in their preference for low

attachment of the relative clause in their L1s". Thus, the first comparison was between Persian monolinguals taking the test in Persian, and English monolinguals taking the test in English. Table 3 indicates descriptive statistics and the t-test results for the comparison. Results are reported in terms of mean number of late closure answers (i.e., responses in favor of low attachment to ambiguous relative clauses). As can be seen in the table, English monolinguals preferred late closure attachment (mean = 7.22) far more than Persian monolinguals (mean = 1.53). The null hypothesis was rejected since there was a significant difference between the two groups on their performance (t50 = - 7.880, p < .05).

Table 3 T-test results for performance of English and Persian monolinguals on LC

Groups	N	Mean	SD	t	df	Sig.
Persian Monolinguals	30	1.53	2.30	-7.880	50	.000
English Monolinguals	22	7.22	2.91			

Comparison 2: English monolinguals and Persian Bilinguals

In this analysis, English monolinguals and Persian bilinguals (with English as their second language) were compared according to their performance on the English test. This analysis addressed question number 2 and tested the following null hypothesis: "There is no difference between monolingual English and bilingual Persian parsers in their preference for the low attachment of the relative clauses in English sentences". Table 4 displays descriptive statistics and the results of t-test for the performance of subjects considering the mean number of late closure preference as the required host for relative clause. The difference between the groups is significant (t50 = 7.99, p < .05), with English monolinguals being significantly more in favor of low attachment to relative clause (LC). This finding refuted the null hypothesis of no difference between English monolinguals and Persian bilinguals.

Table 4 T-test results for performance of English monolinguals and Persian bilinguals on LC

Groups	N	Mean	SD	t	df	Sig.
English Monolinguals	22	7.22	2.91	7.99	50	.000
Persian Bilinguals	30	1.33	2.39			

Comparison 3: Persian Monolinguals and English Bilinguals

Addressing question number 3, and in order to test the following null hypothesis "There is no

difference between monolingual Persian and bilingual English parsers in their preference for the low attachment of the relative clause in Persian sentences", a t-test was run to see if there is a significant difference between two means of late closure responses between Persian monolinguals and English bilinguals performing on the Persian test. Results are displayed in Table 5. As can be seen, there is a significant difference between the two groups (t49 = -6.72, p < .05) with English bilingual showing a higher degree of preference for late closure. According to this finding, the third null hypothesis is also rejected suggesting the L1 influence on L2 parsing. In other words, since English bilinguals follow a late closure strategy in their L1, they carry this even to their L2, i.e., Persian.

Table 5 T-test results for performance of Persian monolinguals and English bilinguals on LC

Groups	N	Mean	SD	t	df	Sig.
Persian Monolinguals	30	1.53	2.30	-6.725	49	.000
English Bilinguals	21	5.80	2.13			

Results and Discussion

The results show that the preference for the high attachment of the relative clause (early closure) which was used by Persian monolinguals, is not adopted in the L2 Persian used by participants whose first language was English, who did not display a significant preference to attach high, probably due to an influence of the processing strategy dominant in their L1, the late closure. Likewise, the study also captured the effect of Persian processing strategy (i.e., early closure) on English. This means that the preference for the low attachment to the relative clause (LC) by the English monolinguals was not true for the L2 English used by native Persian speakers.

As mentioned above, the first comparison showed a significant difference between Persian and English monolinguals' parsing preferences. While Persian monolinguals preferred high attachment (EC) to the relative clauses, English monolingual preferred low attachment (LC).

Based on a main school of thought regarding the parsing strategy used for handling ambiguity, which is called late closure (Frazier, 1978, cited in Altmann, 1998), the clause currently being processed is kept open as long as possible to cause the incoming material to attach within the current or more recent clause. It also suggests the universality of the strategy, i.e., the parsing mechanism is fully universal and innate. According to this principle, in the sentence: *Someone shot the servant of the actress who was on the balcony*, the relative clause "who was on the balcony" should be interpreted as modifying the NP currently being processed, i.e., "the actress" (NP2) rather than "the servant" (NP1). However,

there have been some arguments against this and other proposals have been put forward. Gilboy et al. (1995) believe that relative clauses are one kind of non-primary phrases, which are initially analyzed according to the construal principle. According to this principle, relative clauses are associated with the domain of the current theta-assigner. In the case of the present study, the entire NP1-preposition-NP2 complex is the thematic processing domain within which the RC is interpreted, and hence both NP1 and NP2 could be the hosts for the RC (both "the servant" and "the actress" in the example above).

Regarding the performance of the English monolinguals with 72% of the answers in favour of late closure (NP2) and only 25.4% in favor of early closure (NP1), it can be concluded that late closure principle as a parsing strategy is adopted by English monolinguals, approving Frazier's late closure strategy.

Another issue put forward by Frazier's late closure strategy is the subject of universality. Studies conducted by Cuetos and Mitchell (1988, cited in Gilboy et al., 1995), Carreiras et al. (2001) and Maia and Maia (1999) argued against the innateness and universality of late closure strategy. They suggest that while English readers prefer to interpret the relative clause as an NP2 modifier (late closure; in the example above "the actress"), Spanish, Dutch, French and German readers interpret the relative clause as NP1 modifier (early closure; in the example above "the servant"). This counterevidence for the late closure has been supported in this study by the Persian monolinguals performing 81% in favour of early closure preference (NP1) and only 15.3% in favor of late closure (NP2) in the Persian sentences.

The second comparison shows a significant difference between English monolinguals and Persian bilinguals in their performance on the English sentences. While English monolinguals preferred low attachment (LC) to the relative clauses, Persian bilinguals preferred high attachment (EC). On the other hand, the third comparison also shows a significant difference between Persian monolinguals and English bilinguals in their performance on Persian sentences. While Persian monolinguals preferred high attachment (EC) to the relative clause, English bilinguals preferred low attachment (LC).

These findings are consistent with the results of a previous study conducted by Maia and Maia (1999), which indicates an interaction between the strategies in the bilingual mind. Their study showed that late closure which was used by monolingual English speakers, was not adopted in the L2 English used by Portuguese speakers, who did not display a preference for the late closure due to an influence of the processing strategy dominant in Portuguese, the early closure. Likewise, the study also indicated the effect of the English processing strategy, late closure, on L2 Portuguese used by native English speakers.

In the second finding of the present study, comparing English monolinguals and Persian bilinguals, the late closure preference (72.3%)

displayed by English monolinguals is not adopted in L2 English used by Persian native speakers (13.3% for late closure). The same contradiction can be noticed in the third finding, comparing Persian monolinguals and English bilinguals. The high preference for the early closure (81% of the answers) by Persian monolinguals cannot be found in L2 Persian used by English bilinguals with English as their first language (with 24.3% for early closure). The findings suggest that L1 parsing strategies might become solidified and influence the strategies adopted for L2 processing by bilinguals. This is known as L1 interference on L2 acquisition and might be considered as the reason why late learners of a second language do not usually achieve a native-like performance.

Implications

One of the basic considerations in the area of second language learning research is the ultimate attainment. Researchers are interested in investigating the ultimate level attained by L2 learners: Is it possible to achieve native-like performance? The advocates of the "Critical Period Hypothesis" (Johnson & Newport, 1989) and "Fundamental Difference Hypothesis" (Bley-Vroman, 1989) assert that the outcome of second language learning is either failure or non-native competence. Although recent research has challenged this notion of failure (Birdsong, 1992), the results of this study provide evidence that there are processing distinctions between native speakers of a language and second language learners who are at the end stage of language learning. These results show that there are differences in the relative clause processing strategies between native speakers and second language learners. This finding might have no direct pedagogical implications for teachers but it can provide an insight that rather than focusing the attention strictly on linguistically oriented distinctions, it would be worth paying attention to the processing distinctions, as they may be the obstacles to the ultimate attainment. The importance of this issue is also clear in the following statements put forward by Gass and Schachter (1989):

This lack of focus on pedagogical concerns [in second language research] does not come from the belief that these concerns are uninteresting or without value; instead, it stems from the belief that sound pedagogical practices must be anchored in in-depth knowledge of the capabilities of second language learners and the processes and strategies that they need for language learning to take place. (p.3)

One important issue that deserves more investigation is the status of participants. In the present study, bilingual groups do not share the same characteristic in terms of having the L2 as their foreign vs. second language. While all the Persian bilinguals learned English as a foreign language, not studying in an English-language country, the English bilinguals learned Persian as their second language while living in Iran. This issue is worth paying more attention since it seems that there is less L1 parsing interference in the case

of people using L2 as their second language.

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نحوه حل ابهام جملات درفارسی و انگلیسی به عنوان زبانهای اول و دوم

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چکیده

تحقیق حاضر به نحوه حل ابهام در جملات مبهم انگیسی و فارسی بهوسیله افرادی که زبان اول و دوم ایشان فارسی و انگلیسی است میپردازد. این تحقیق با هدف بررسی وجود و یا عدم وجود اختلاف در نحوه حل اینگونه ابهامات بهوسیله افراد یک زبانه و دو زبانه صورت گرفت. نتایج تحقیق نشان از وجود اختلاف در نوع حل ابهام داشت. در راستای اهدای پیش گفته شده تستی متشکل از ده جمله مبهم و ده جمله بدون ابهام در اختیار شرکت کنندگان قرار گرفت. نسخه فارسی تست در اختیار فارسی زبانان یک زبانه و انگلیسی زبانانی که زبان دومشان فارسی است قرار داده شد. در حالی که نسخه انگلیسی تست به انگلیسی زبانان یک زبانه و فارسی زبانانی که زبان دومشان انگلیسی است ارائه گردید. بررسی آماری نتایج نشان از ارجحیت قابل توجه فارسی زبانان به استراتژی Early Closure و ارجحیت قابل توجه انگلیسی زبانان یک زبانه به استراتژی Late Closure داشت. همچنین نتایج نشانگر تأثیر نحوه حل ابهام در زبان اول روی نحوه حل ابهام در زبان دوم می‌باشد. این بدان معناست که انگلیسی زبانانی که زبان دومشان فارسی است در تست فارسی از استراتژی Late Closure که در زبان اول ایشان استفاده می‌شود پیروی می‌کنند. همچنین فارسی زبانانی که زبان دومشان انگلیسی است نیز در تست انگلیسی از استراتژی Early Closure که روش معمول رفع ابهام در زبان فارسی است استفاده می‌کنند.

کلیدواژگان: ابهام نحوی، تأثیر زبان اول، فارسی و انگلیسی به عنوان زبان اول و دوم، نحوه حل ابهام نحوی در زبان‌های اول و دوم، جملات مبهم در فارسی و انگلیسی

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