Acquisition of cleft structures in L1 and L2

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Abstract:

The present study aims at exploring the processing difficulty of cleft structures as a type of relative clause for EFL and Persian as first language learners.The impact of head nouns with various functions as well as that of embedding on the processing of Persian and English cleft structures has been investigated in the present study.The participants were 68 Iranian male and female students.Two sets of picture selection tests along with 27 items both in Persian and English were designed for both the Persian and English groups.The Persian items consisted of 4 different cleft types : subject cleft, object cleft with resumption ,object cleft with gap and object clitic cleft .The Engliish language included either subject cleft or object cleft type.Results showed that word order has a significant effect on Persian cleft processing of Iranian children.The results also revealed that word order has a significant effect on EFL learners' processing of English clef sentences.

Key terms: Cleft Sentence, Word Order, Head Noun, Relative Pronoun, Isomorphim

I.   Introduction

Research studying sentence processing aims to explore how human parsers analyze the structure of sentences and get their meaning as a whole (Wingfield & Titone, 1998). Over the past thirty years, researchers in psycholinguistics have endeavored to elucidate the types of information used during sentence processing and to account for processing difficulties (Reali & Christiansen, 2006). Clefts are one grammatical structure that provide considerable insight into language processing difficulty. Interest in clefts is motivated by their universality in languages of the world, unique syntactic properties, and frequency in everyday use of language.

Research on cleft structures is relatively scarce, compared to numerous studies on relative clauses (RCs) which are similar to them in structure. Research has reported a subject RC advantage over object RCs. To account for the processing disadvantage of object RCs in English and other languages, researchers have proposed hypotheses either in terms of structural differences (MacDonald & Christiansen, 2002) in which a structure's complexity is defined as the distance traversed by a syntactic operation, calculated by a count of the number of nodes crossed, or non-structural differences including memory load differences (Gordon et al. 2001). The difficulty of RCs has also been accounted for by the number of intervening words between the head and the gap (Tarallo & Myhill, 1983) in terms of integration and storage costs (Gibson, 1998). The integration cost suggests that since activation level decays over time, the greater the distance between the head and the gap, the more challenging the integration of the new input into the structure. The storage cost, on the other hand, is the difficulty of maintaining earlier predictions in memory as the distance between the head and the gap increases.

The ease in processing subject RCs has also been accounted for by the compliance of the word order in subject RCs with the canonical word order in world languages which is highly frequent, thus aiding the processing of subject RCs due to the processor's experience with simple sentences (MacDonald & Christiansen, 2002). In object RCs in English, which is a canonical SVO language, the object precedes the verb, which is a non-canonical order.

The finding that adult speakers of English, French, Dutch, and some other languages face fewer difficulties in processing subject RCs than object RCs (e.g. King & Just, 1991) has also been explained in terms of the varying distance between filler and gap (Wanner & Maratsos, 1978). Since longer dependencies are computationally more demanding and parsing strategies are based on economy (Arosio, Adani, & Guasti, 2005), subject RCs are predicted to be easier than object RCs because the filler-gap distance in the subject RC is shorter than that in the object RC.

According to Word Order Difference Hypothesis which is rooted in the differences in canonical versus non-canonical word order (MacDonald & Christiansen, 2002; Bever, 1970), the simplicity in processing subject RCs, in English for instance, can be accounted for by the conformance of the word order in subject RCs with the canonical word order in English (SVO) which is extremely recurrent, therefore assisting the processing of subject RCs due to the processor's experience with simple sentences. A significant subject in linguistics is the difference between the canonical word order and non-canonical structures that may be in a particular language. Some researchers have purported that second language learners (e.g.,

Cook, 1994), like first language learners (Slobin & Bever 1982), are interested in the canonical order of the language they are learning.

Cleft constructions in English

Declerk (1988) states that cleft constructions are consisted of two clauses which convey a single semantic proposition in order to specify a value for a variable. Lambercht (2001) viewed cleft construction as a complex sentence structure which is composed of a matrix clause and a relative-like clause that convey one single semantic proposition together. Reducing the two clauses into one clause would not hurt meaning. The head of the matrix clause is a copula whose focus constituent is coindexed with the argument of the relative clause. Van Valin et al. (1984) viewed RRG as an elucidating approach for cleft construction analysis and believe that RRG is a moderate functionalist theory studying language in communicative terms. Halliday (1967) regards the clause as the domain for three main areas of syntactic choices: Transitivity, mood, and theme. Transitivity is the grammar experience, mood is the grammar of speech and theme is the grammar of discourse.

It- cleft constructions

In it-cleft constructions an element is placed in focus position within a copular matrix clause (Pavey, 2004). Focus is the constituent that accompanies the copula. In Collins' (1991) terms it is called the highlighted element. Linguists like Headberg (1990) and Lambercht (2001) call it clefted constituent. The cleft clause carries the pragmatic presupposition which appears after the relative pronoun:

Cleft pronoun	Cleft clause
IT is Mary	Who always argues

Copula Clefted constituent

If background information is provided the cleft clause can be omitted. Wh-clefts are also divided into two types of basic wh-clefts and reverse wh-clefts (Huddleston, 1984).

He categorizes wh-clefts as identificational sentences. Identified is the headless relative clause, while the sentence bearing identity relation between the two linguistic units is called the identificational:

a- what surprises me is their enthusiasm.

b- their enthusiasm is what surprises me.

It should be noted that it-clefts are not reversible so far as there is not any equal relationship between the clefted constituent and the cleft clause for the reason that the function of it- clefts is to disclose the identity of the proposition stated in the cleft clause (Halliday, 1970).

Characteristics of it-clefts and wh-clefts

Huddleston (1984) believes that the cleft construction is more communicatively dynamic in comparison with the relative clause:

What I am looking at is the picture of a mountain.

In fact the cognitive status for the relative clause and the cleft clause is inferable- now, while in a clause like:

It is the picture of a mountain that I am looking at.

The cognitive status is new and the first sentence is considered as much more probable to utter than the second one, for thematizing is much more likely in elements containing lower informational load. In reality in wh-clefts there is theme- rheme sequencing taking the wh-cleft and the relative clause. Contrastively, this sequence reverses in it- cleft (Huddleston, 1984).

The relative clause in both it- clefts and wh-clefts carries given information or presupposed in formation, therefore as Declerk (1988) notes, it cannot be negated. Cleft constructions are also non- negotiable (Delin, 1989).He claims that this feature of it-clefts prevents negation. Another semantic feature of it-clefts is their Anaphoricity as Delin puts it. That is an antecedent is required by the presupposed proposition. Considering the syntactic characteristics of it- clefts, O' Grady (1999) noted that they are consisted of two main parts: "Focus goes after the copula and is taken to be an essential component. The second essential constituent is a relative pronoun from which the focus constituent is drawn. *The clause* containing the focus constituent follows the relative pronoun.

Likewise, wh-clefts   are composed of a nominal relative clause and a predicate. The predicate includes the copula and a noun phrase or other phrases that are semantically related to the first part.

Akmajian (1970) refers to another interesting fact worthy of attention regarding it-clefts which is the fact that the first reflexive pronoun in it- clefts which appears in the cleft clause is coindexed with its antecedent in the matrix clause while it agrees with its antecedent both in number and person. Contrastively, the verb in the cleft clause is in agreement with the pronominal constituent just considering number. It should be said that in it-cleft sentences, in

the matrix clause, copula is always singular. Based on the expletive approach, proposed by Chomskey (1977), Delahunty (1982) the copula and the cleft pronoun do not have any noticeable impact semantically and just the semantic relation exists between the cleft clause and the clefted constituent. However, Hedberg (2000) claims that the cleft pronouns like it, this or that just function as a determiner.

Persian clefts and Pseudo clefts

Based on works of Mahootian (1997), Gholam Alizahe (1998) and Karimi (2005), Persian clefts are categorized into three groups of it-clefts, basic wh-cleft sentences and reverse wh-cleft sentences.

Clefting in Persian occurs when the focused element is moved from its unmarked position to the beginning of the sentence and them is followed by a copula (bud- am, to be [PAST] or (hast- an, to be [PRES]) and a ke "that" relative clause.

a- In Ali bud ke šoma ra deed.

It was Ali who saw you.

It is also possible for an indirect object, a prepositional adverbial and a NP adverbial to occur in the clefted constituent position.

b- be Hamid bud ke man mashino d ādam.

It was to Hamid that I gave the car.

c- tu daneshkadeh bud ke man didamesh.

It was at college that I saw her.

d- zohr bud ke hemeh raftan.

It was at noon that every body left.

In sum the structure of Persian cleft sentences can be represented as follows:

(in)+ clefted constituent+ copula (hastan; bud- an)+ ke- clause.

According to Mahootian (1996) pseudoclefting has to do with the movement of the non-focused elements from their non- canonical positions and preceding them with phrase like *kasi ke* the one who *ĉizi ke*, the thing which, *jāi ke*, the place where, *hengāmi ke*, the time when, etc.

a- kasi ke ketab dus dār-e vidā-st,

the one who likes book is vide.

b- ĉizi ke Reza sobh ba sang šakast šišeh bud.

The thing that Reza broke with a stone was glass.

Gholam Alizadeh (1998) also represents the structure of basic and reverse pseudo clefts as follows respectively:

+ke-clause+	- Kas-I, the one - ĉiz-I, the thing - jā-I, the place - zamān-I, the time - dalil- I, the reason	Clefted constituent+ copula

- kas-I, the one - ĉizi, the thing - jā-I, the place - zamān-I, the time - dalil- I, the reason	Copula+ ke- clause

Syntactic structure of Persian clefts

Pavey (2004) states that Persian cleft sentences are composed of a subordinate cleft clause and a matrix core through the complementizer which is termed clause linkage maker in RRG the cleft is a pragmatic presupposition with the possibility to be omitted so far as it carries that part of information which already exists in the background context.

In English clefts the subject is placed in the non- topic position after the copula. However, the case is different taking Persian clefts. With the subject being placed in a position preceding the copula in order to challenge the pragmatic competence of the speaker along with that of the hearers (Gundel, 1977).

Interestingly, in Persian cleft constructions the inclusion of "in" would result in ungrammaticality if the clefted constituent is a prepositional phrase or an adverbial like the examples provided here:

a- in be Mina bud ke ketāb ra dadam.

b- in dishab bud ke anha harkat kardand.

In contrast, in case the clefted constituent is a noun phrase grammaticality wouldn't be hurt:

b- in shoma budi ke be moghe narafti.

Due to the paucity of research, numerous aspects of these structures in terms of acquisition, processing difficulty in comprehension and production, the nature of processing Persian and English clefts by Persian-speaking learners have unfortunately remained unclear.

The present study, therefore, aims at partially filling this gap by seeking to explore the processing difficulty of cleft structures which are a type of relative clauses for EFL and Persian as a first language learners. An attempt is made to test the predictions of different hypotheses regarding the processing difficulty of various types of relative clauses. These hypotheses will be tested in two separate studies using data from two different tasks, a picture selection and a sentence completion task. The aim of the study is to examine the impact of head nouns with various functions as well as that of embedding on the processing of Persian and English cleft structures.

II.   Research Questions

The main purpose of this study is to find out any possible effect canonical word order may have on sentence processing of Iranian EFL children.

Therefore the present study aims at answering the following questions:

a)   What is the impact of word order on processing Persian cleft structures?

b)   What is the impact of word order on processing English cleft structures by Iranian EFL children?

III.METHODOLOGY

Participants

The participants of this study were 68 Iranian male and female students. 33 of them were within the age range of 13 to 15 years old who were learning to speak English as a foreign language at an English Language Institutes in Zanjan and 35 of them were 8-to-14 year-old students who were learning their native language Persian

Instruments

The Nelson Placement Test was administered to the population of thirty students for the purpose of measuring the participants' level of proficiency. The Nelson Test consists of 50 multiple-choice items and its reliability was estimated through KR-21 formula. Although the questions were not separated into different parts, they measured the examinees' general knowledge on grammar and structure as well as vocabulary and meaning.

Two Picture Selection Tests were used for the main study. The first one, which was constructed in English and was for English Language Group, included 27 items. Each item had a statement as the stem and three pictures as choices. Participants had to select one picture which matched the statement. Twenty of the items were canonical and seven items were noncanonical.

The second Picture Selection Test was the same as the first one described above except that this was in Persian language and the content and level of difficulty would correspond to the age of 8-14.

Procedure

Before carrying out the main study, a pilot study was carried out by 10 students in order to examine some of the basic factors affecting the research. These factors included the practicality, the amount of time required by teachers, their reactions to the test items, the reliability and validity of the tests. Then the Nelson Test was administered to 30 participants who were learning English at a Language Institute in Zanjan in order to select the 20 homogeneous participants for English Language group. After selecting homogeneous learners, they were given about 27 English statements. Half of the statements were canonical (SVO) and half of them non canonical. After hearing each statement, the researcher showed them some pictures.. The students had to select one of the pictures which corresponded to the statement given. Then the frequency of the number of the participants who answered the canonical statements was compared to that of non canonical statements.

For Persian group who were three-to-seven-year-old children, the same procedure was used except that these children were given Persian items.

IV. DATA ANALYSIS

The version 19 of Statistical Package for Social Science (SPSS) was used to analyze the data. After collecting the data from two sets of tests, the frequency of the participants who answered the canonical and non canonical items was compared.

V. RESULTS

The effect of word order on processing cleft structures in L_1

The first null hypothesis predicted that word order has no significant effect on Persian cleft processing by Iranian children.

In order to analyze the data to investigate null hypothesis one, first the participants' performances on the subject cleft, object cleft with clitic, object cleft with resumption, and object cleft with gap in four age groups were assessed. Table 1 presents the related descriptive statistics.

Table 1

Descriptive statistics for Participants' Performances on Four Types

Sentence type	Age group (in month)	Mean	Std. Deviation	N

	96-116	4.22	1.302	9
	117-137	4.78	.667	9
Subject	138-158	4.43	.976	7
	159-179	4.60	.843	10
	Total	4.51	.951	35
	96-116	2.33	1.871	9
	117-137	2.33	1.871	9
Object with clitic	138-158	3.43	2.070	7
	159-179	3.90	1.449	10
	Total	3.00	1.863	35
	96-116	3.00	1.732	9
	117-137	2.56	2.128	9
Object with resumption	138-158	3.57	1.902	7
	159-179	2.80	1.814	10
	Total	2.94	1.846	35
	96-116	2.11	1.965	9
	117-137	2.67	1.871	9
Object with gap	138-158	3.57	2.149	7
	159-179	2.90	1.729	10
	Total	2.77	1.896	35

Results are reported in terms of average mean score of participants to process the Persian statements that were subject cleft, object cleft with clitic, object cleft with resumption, and object cleft with gap production in different age groups. As can be seen in

the table, the average mean score of subject cleft (M = 4.51, SD = .95) was much more than object cleft with clitic (M = 3.00 SD = 1.86), object cleft with resumption (M = 2.94 SD = 1.84), and object cleft with gap (M = 2.77, SD = 1.89) (See Appendix A for the raw results). Figure 1 below provides a graphical demonstration of the result.
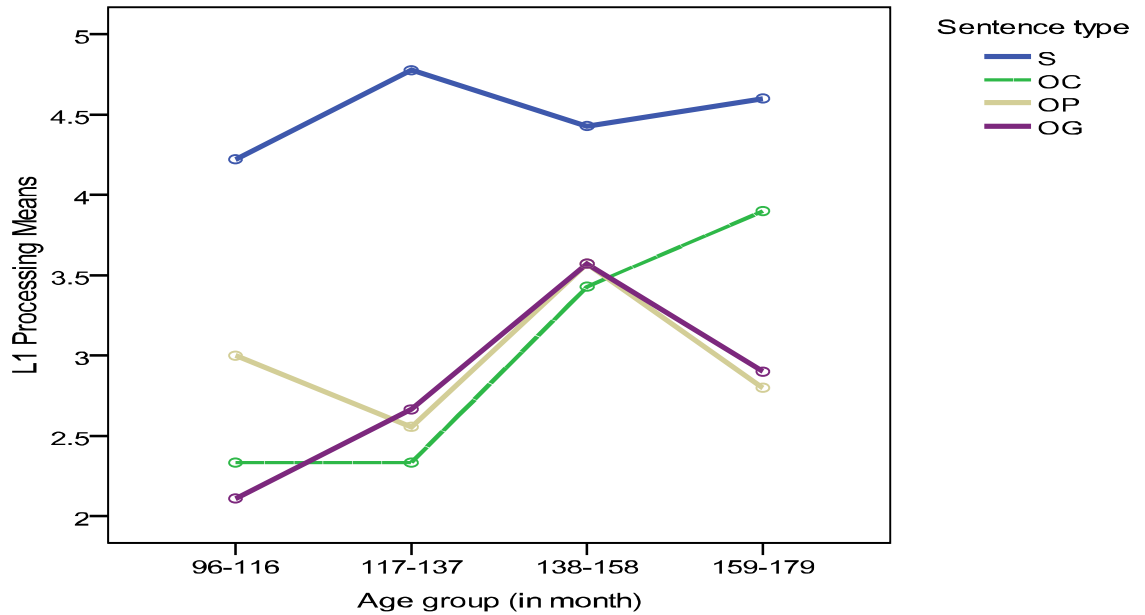

Figure 1. Mean L1 processing on four sentence types in different age groups

In order to see whether the differences were significant or not, a repeated measure ANOVA was performed with sentence types as within-subject factor and age as between-subject factor. Table 2 displays the results.

Table 2

ANOVA Results for L1 Processing of Pseudo-clefts on Three Sentence Types

Effect	Lambda Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Sentence type	.561	7.559	3.000	29.000	.001	.441
Sentence type * Age	.426	3.298	9.000	70.729	.002	.247

ANOVA showed a statistically significant effect for sentence type ($F_{(3, 29)}$ = 7.55, p = .001, $p < \alpha$) in which F ratio (F = 7.55) exceeded F critical (F = 2.93), and p value (p = .001) was less than .05 level of significance. Therefore, the first null hypothesis which stated that

cleft type (word order) have no significant effect on Persian cleft processing by Iranian children was rejected. So it can be claimed that isomorphic mapping has a significant effect on Persian cleft processing of Iranian children.

Furthermore, the interaction effect between the within and between-subject factors, i.e. sentence type* age effect was significant ($F = 3.29$. $p = .002$, $p < α$) (See Table 2).

Although we have found a statistically significant difference between the four sets of scores, we also need to evaluate the effect size of this result. The value we are interested in is Partial Eta squared. Based on result in Table 2, the value obtained in this study is .44 for the effect of sentence type and .24 for the effect of the interaction between sentence type and age.

Since we have obtained a statistically significant result from the previous analysis, this suggests that there is a difference somewhere among our set of groups. It does not tell us which groups or set of scores differ from one another. This information is provided in the Pairwise Comparisons Table 3, which compares each pair of sentence types and indicates whether the difference between them is significant or not.

Table 3

Post-hoc Comparisons for L1 Processing of Clefts on Four Sentence Types

(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.
	OC	1.508*	.356	.001
S	OP	1.525*	.357	.001
	OG	1.695*	.358	.000
	S	-1.508*	.356	.001
OC	OP	.017	.192	1.000
	OG	.187	.108	.563

OP	S	-1.525*	.357	.001
	OC	-.017	.192	1.000
	OG	.169	.205	1.000
OG	S	-1.695*	.358	.000
	OC	-.187	.108	.563
	OP	-.169	.205	1.000

Post-hoc Comparisons showed that subjective was statistically different from object cleft with clitic (p = .001, p < .05), object cleft with resumption (p = .001, p < .05), and object cleft with gap (p = .000, p < .05).

However, the difference between object cleft with clitic and object cleft with gap was not significant (p = .56, p > .05), object cleft with clitic was not statistically different from object cleft with gap (p = 1.000, p > .05), and the difference between object cleft with resumption and object cleft with gap was not significant (p = 1.000, p > .05).

The effect of age on processing cleft in L$_1$

The second null hypothesis predicted that age has no significant effect on Persian language processing of Iranian children. In order to test this null hypothesis, the Between-Subjects Effects ANOVA for the effect of age was used. Table 4 clarifies the related results.

Table 4

Tests of Between-Subjects Effects for Effect of Age on L1 Processing of Pseudo-clefts

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	1521.375	1	1521.375	206.040	.000	.869

Age	15.143	3	5.048	.684	.571	.062
Error	228.900	31	7.384			

ANOVA failed to detect any statistically significant effect for age ($F = .68$, $p = .57$, Effect size $= .06$) in which p value ($p = .57$) was more than .05 level of significance; consequently, the second null hypothesis was not rejected. Thus, with high degree of confidence, we can assert that age has no significant effect on English language processing of Iranian children.

The effect of word order on processing cleft structures in L$_2$

The third null hypothesis predicted that word order (cleft type) has no significant effect on English language processing of Iranian children.

In order to analyze the data to investigate null hypothesis three, first the participants' processing performances on the English subject cleft and object cleft items were assessed. Table 5 provides us with the related statistical information.

Table 5

Descriptive Statistics for Participants' Performances on Two Sentence Types

	Age group (in month)	Mean	Std. Deviation	N
	156-167	8.46	.967	13
	168-179	8.73	1.555	11
Subject	180-191	8.78	1.302	9
	Total	8.64	1.245	33
	156-167	8.15	1.625	13
	168-179	6.64	3.139	11
Object	180-191	7.33	1.732	9
	Total	7.42	2.292	33

The average mean score of participants to process the English items that were subject cleft (M = 8.64, SD = 1.24) was considerably more than processing the English items that were object cleft (M = 7.42, SD = 2.29) (See Appendix B for the raw results). Figure 2 below illustrates a graphical demonstration of the result.
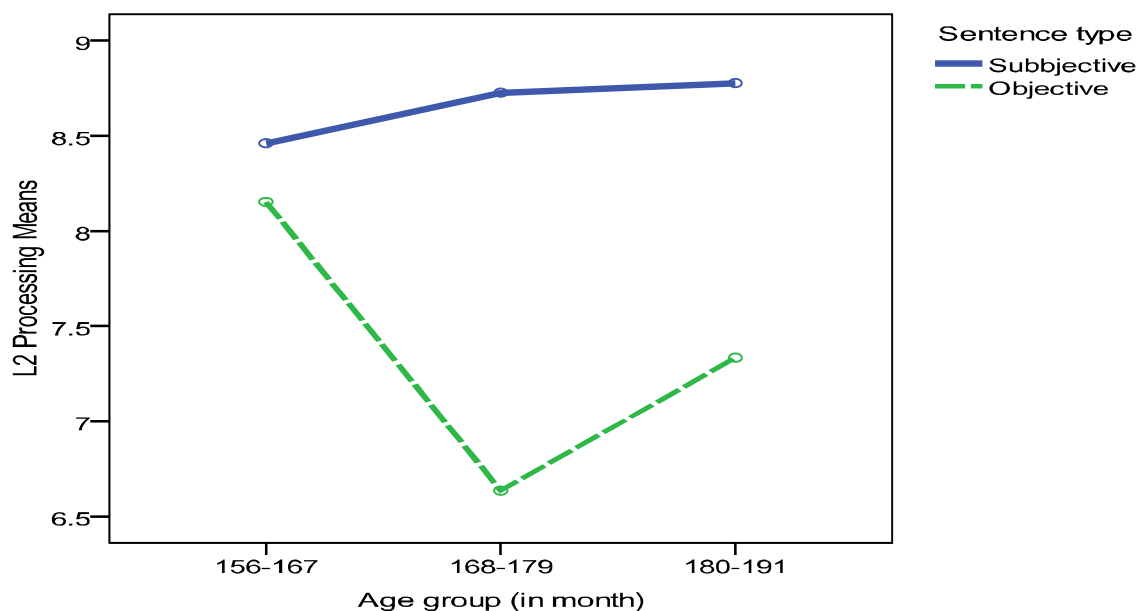

Figure 2. Mean L2 processing on four Sentence types in different age groups

In order to test the third null hypothesis, a repeated measure ANOVA was performed with sentence types as within-subject factor and age as between-subject factor. Table 6 clarifies the results.

Table 6

ANOVA Results for L2 Processing of Pseudo-clefts on two Sentence Types

Effect	Lambda Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Sentence type	.813	6.911	1.000	30.000	.013	.187
Sentence type * Age	.921	1.280	2.000	30.000	.293	.079

ANOVA results revealed statistically significant effect for sentence type ($F_{(1, 30)}$ = 6.91, p = .01, $p < \alpha$) in which F ratio (F = 6.91) was greater than F critical (F = 4.17), and p value (p = .01) was less than .05 level of significance.; as a result, the third null hypothesis which stated that celft type (word order) has no significant effect on English language processing of Iranian children was rejected. So it can be claimed that word order has a significant effect on English language processing of Iranian children.

In addition, the interaction effect between the within and between-subject factors, i.e. sentence type* age effect was not significant (F = 1.28. p = .29, $p > \alpha$).

Even though we have observed a statistically significant difference between the four sets of scores, we also need to assess the effect size of this result. The value we are interested in is Partial Eta squared. Based on result in Table 6, the value attained in this study is .18 for the effect of sentence type and .07 for the effect of the interaction between sentence type and age.

The effect of age on processing cleft structures in L_2

This null hypothesis predicted that age has no significant effect on English language processing of Iranian children. In order to examine this null hypothesis, the Between-Subjects Effects ANOVA for the effect of age was used. Table 7 clarifies the related results.

Table 7

Tests of Between-Subjects Effects for Effect of Age on L2 Processing of Pseudo-clefts

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Intercept	4145.396	1	4145.396	1409.110	.000	.979
Age	4.684	2	2.342	.796	.460	.050
Error	88.256	30	2.942			

ANOVA did not reveal any statistically significant effect for age (F = .76, p = .46, Effect size = .05) in which p value (p = .46) was more than .05 level of significance; so the fourth null hypothesis was not rejected.

VI.DISCUSSION AND CONCLUSION

Discussion of the Results from Study 1

The current study investigated the acquisition of cleft in Persian-speaking children aged 8–15-years. Persian has typological features that make it an interesting data point in the context of debates about RC complexity. Like Indo-European languages such as English and German, it has post nominal RCs; however, like East Asian languages such as Japanese and Korean, it is a pro-drop language and has SOV word order. These two broad language categories have been argued to differ in experiments investigating RC complexity, making Persian a potentially interesting middle ground. We specifically tested the predictions of three theoretical approaches to sentence complexity, which we evaluate with reference to our data below.

Generally speaking,a significant difference among the cleft structures was found.The results of the study confirm the previously documented asymmetry in comprehension of clects and relative clauses. The prediction that Persian-speaking children would experience more difficulty processing object clefts than subject clefts was supported by the results, which is in keeping with the predictions of the NPAH and the findings of a number of studies on a variety of languages (Frauenfelder et al., 1980; Gibson, 1998; Gibson & Schutze, 1999; Schriefers et al., 1995). A number of studies have shown that children tend to rely on resumption in their early RCs. Resumptive strategies are often the first strategy acquired by children (Labelle, 1990 on Canadian French, Goodluck & Stojanovic, 1996, on Serbocroatian). Thus, it can be claimed that resumption is a coping strategy that compensates for processing complexity.

Thus, the first major finding was that the children found subject clefts easiest to interpret. This prediction is consistent with all of the theoretical approaches to structural complexity.

There are some broad theoretical issues that are raised by these results. The first concerns the question as to why non-canonical word order causes difficulty for the children. Numerous studies of language acquisition have shown that children experience difficulty with non-canonical structures (e.g., Bates & MacWhinney, 1982, 1989; Bever, 1970; Slobin & Bever, 1982). Such results clearly show that children's processing systems, like those of adults, are attuned to the frequency distributions of their input language (Townsend & Bever, 2001). That is, upon segmenting a series of nouns and verbs in the speech stream, children

prefer to assign grammatical roles according to how they are most frequently assigned given their history speaking and listening to the language.

What the results also suggest, however, is that children prefer this strategy over attending to local cues to interpretation (i.e., resumptive pronouns). This is inconsistent with arguments in the literature that suggest that local cues are privileged in acquisition (e.g., Slobin, 1982), but consistent with results reported by Dittmar, Abbot-Smith, Lieven, and Tomasello (2008), who showed German-speaking children prefer to use word order to interpret sentences over and above case marking until the age of 7-years. Since nouns in German are marked for case on determiners, the cue is local and, in general, fairly reliable. Despite this fact, children do not use it as a cue until they are school-age. Why might this be the case? It so happens that although case marking is a reliable cue to interpretation, the case system is rather difficult for children to acquire because it is fairly complex, owing to the fact that there are three noun genders and different case paradigms for each. Therefore, although reliable the cue of case marking is not as readily available to children as is word order. As such, since word order is both reliable and available to children, they appear to rely on the cue that will provide them with the best chance at pursuing correct interpretation, or, in other words, they pursue the strategy that has been most successful for them in the past. Coming back to the Persian data, it is likely that the strength of canonical word order as a cue to interpretation, and potentially the low perceivability (due to their status as clitics) or availability of resumptive pronouns (due to the fact that object clefts are in general rarer than subject clefts), result in young children choosing word order as their preferred comprehension strategy.

The results from the present study suggest that Persian patterns like Indo-European languages in that subject clefts were found to be easier to process than object clefts, despite Persian being typologically different in some crucial respects. Recent findings in English and German have shown that object RCs are not always more difficult than subject RCs. In particular, Kidd et al. (2002) have shown the subject-object asymmetry disappears when children are tested on object RCs that conform to the discourse conditions that generally lead to object RC use: when they contain (i) an inanimate head noun, and (ii) a pronominal RC subject, as in *This is the pen that I used yesterday* (cf. *This is the boy the girl chased yesterday*). Since we only tested animate NPs in this study, a similar effect is yet to be established in Persian. Furthermore, it is unclear at what age Persian-speaking children become sensitive to the role of the resumptive pronoun in both object and genitive RCs. This would be valuable information to know, because resumptive pronouns can potentially

alleviate the complexity associated with non-canonical word order in these two structures. These issues await further research.

Gibson's (1998) Dependency Locality Theory (DLT) can account for the difficulty the participants in this study faced in processing Persian object clefts. DLT describes this difficulty in terms of integration and storage costs. Since the linear distance between the head and the resumptive clitic in object cleftsis greater than that between the head and the gap in subject RCs, the cost of integrating a new head into the structure is higher. Also maintaining earlier information in memory as the distance between the head and the clitic increases is more challenging which increases the storage cost**.**

According to the WDH (Bever, 1970; MacDonald & Christiansen, 2002), highly frequent structures are easier to process due to the processor's prior experience. It is assumed that the more frequently a grammatical construction occurs in the input, the more easily it is processed (Bybee & Hopper, 2001). There is, to date, unfortunately no data on the frequency of different cleft types in Persian-speaking children's spontaneous speech or the input they receive from their parents or peers. With the availability of such corpora, one could interpret these results from the frequency viewpoint as well.

The prediction that Persian-speaking children would experience more difficulty processing object clefts than subject clefts was supported by the results, which is in keeping with the predictions of the NPAH and the findings of a number of studies on a variety of languages (Frauenfelder et al., 1980; Gibson, 1998; Gibson & Schutze, 1999; Schriefers et al., 1995). But contrary to the predictions of structurally-based hypotheses, object clefts with resumptive elementswere as difficult as gapped object clefts. As the results show, structural accounts like Linear Distance Hypothesis (LDH) proposed by Hawkins (1989) and Tarallo & Myhill (1983) and O'Grady's (1999) Structural Distance Hypothesis (SDH) cannot account for the equal processing complexity observed in our study for object clefts with gap and object clefts with resumptive elements.

Clitics are always used in genitive constructions and this invariant clitic gives the children a processing advantage, because it has high reliability as a cue to interpretation. In contrast, in the object clefts, which optionally allow a clitic, there is lower reliability, because the clitic is not always there. Thus, as the results show, it does make sense to attempt to explain the results in purely structural terms, because such explanations can never adequately capture the processing complexity of object clefts with gap and resumptive elements for Persian-speaking children. Instead, the result must be explained by appeals to other aspects of

language that are crucial to parsing - frequency of structure, the reliability of the cue to interpretation, and the semantic complexity associated with different constructions.

Thus, based on the findings of the present study, the findings as to the processing of Persian RC structures by Persian speaking children can be summarized as follows: 1) Subject focus clefts are easier than object focus clefts. 2) Word order canonicity makes a difference in processing RCs.

Discussion of the Results from Study 2

The most obvious finding of the study is that subject focus clefts are easier than object focus clefts, a finding in line with the predictions of the difficulty order by both Keenan and Comrie's (1977) Noun Phrase Accessibility Hierarchy and Keenan's (1975) Relativized Subject Accessibility. Thus, the claim that subject clefts are more accessible than object clefts is supported by the findings. In addition to basic differences between Persian and English RCs noted by Karimi (2001), there is a sharp difference between them in that branching does not exist in Persian. Persian is a language with SOV word order, and therefore, the final constituent in Persian declarative sentences and subordinate clauses is a verb phrase. Consequently, RC structures are always embedded within the matrix clause and right-branching is not allowed. Considering this difference, one would expect that the Persian EFL learners participating in this study who are familiar with the concept of embedding in their first language and whose native language does not allow right-branching would face less amount of difficulty processing these structures in the L2 they are learning. This may account for the contrast between the finding of the present study and the finding of some researchers who have reported greater difficulty with embedded RCs (e.g., Slobin, 1973; Correa, 1995) in languages which are not verb-last.

Thus, based on the results of the present study, the findings as to the processing of RC structures by Persian EFL learners can be summarized as follows: 1) Subject focus RCs are easier than object focus RCs. 2) Persian EFL learners opt for a linear parsing strategy in processing RC structures. 3) Word order canonicity makes a difference in processing RCs. 4) Distance-based hypotheses can account for the difficulty order of RC processing. 5) Certain features in EFL learners' L1 seem to aid or impede their comprehension of English RCs.

Although at the level of speculation, the reason why Persian speaking EFL learners face great difficulty in comprehending English object clefts may lie in their first language transfer effects as Persian allows a personal or clitic pronoun within the RC and such a resumptive pronoun is absent in English clefts to aid comprehension. This difficulty can be

justified by the possibility of a linear parsing strategy on the part of Persian EFL learners which is partly due to their previous experience with the canonical word order in English.

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