Acquisition of English Relative Clauses by Adult Persian Learners: Focus on Resumptive Pronouns

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Abstract

Tsimpli and Dimitrakopoulou (2007) observed that uninterpretable features are unavailable in second language acquisition after the critical period. In this paper, we verify this claim by providing evidence from Persian speaking learners of English as an L2 on the status of resumptive pronouns (RPs) as uniterpretable features. Unlike English which does not allow RPs, Persian shows various behaviors across different relative clauses (RCs). In Persian, RP is ungrammatical in subject, optional in object, and required in object-of-preposition RCs. To examine the status of RPs in these learners' interlanguage, a grammaticality judgment test and a translation test were developed and administered to 111 adult Persian learners of English at four proficiency levels and 18 English native speakers. Repeated measures ANOVA results, tracing the effect of proficiency on different RC types, suggest that as their proficiency improves, learners become more native-like in rejecting RPs in English. However, in comparison with the native speakers, even advanced learners show marked performance deficits notably in object and object-of-preposition RCs. These results are in line with the predictions of the Interpretability Hypothesis proposed by Tsimpli and Dimitrakopoulou. The findings also provide some implications for the age-related issue in L2 teaching.

Keywords: relative clause, resumptive pronoun, interpretability hypothesis**,** persian EFL learners, consistency analysis

1. Introduction

The status of resumptive pronouns in the interlanguage of second language (L2) learners has been extensively studied (Gass, 1979; Hyltenstam, 1984;

1990; Pavesi, 1986; Rezai, 2011; Tarallo & Myhill, 1983; among others) which shows the importance of these pronouns in the process of second language acquisition (SLA, henceforth). This study investigates the acquisition of three types of English RCs (subject, object, and object-of-preposition), by Persian speaking learners, focusing on the status of RPs in their interlanguage. Persian, as a null-subject language with SOV word order, has distinctive syntactic features which make it a good data point for cross-linguistic studies. Like English, Persian RCs are NP initial and are always introduced by an "invariant complementizer *ke*" (Taghvaipour, 2004, p. 276). Persian shows various behaviors across different RCs: RPs are not possible in subject RCs (1), optional in object RCs (2), and obligatory in object-of-preposition RCs (3) (Taghvaipour, 2005). (In all the Persian restrictive RCs, -i represents relative particle (REL, henceforth) which is attached to the head noun and OM stands for object marker.)

(1) Subject RC (only -RP)
Anha mærd-i [ke ⸺ /*u inja zendegi mikærd] ra peyda kærd-ænd.
They man-REL [that ⸺ /he here life do-PAST] OM find did-3pl
They found the man [who (⸺ /*he) lived here].
(2) Object RC (both -RP and +RP)
Mæn mærd-i ra [ke anha ⸺ /u ra ferestad-ænd] peida kærd-æm.
I man-REL OM [that they ⸺ /he OM send-PAST-3pl] find did-1sg
I found the man who they sent.
(3) Object-of-preposition RC (only +RP)
Mæn mærd-i ra [ke šoma æz *⸺ /u pul qærz gereft-id] didæm.
I man-REL OM [that you from ⸺ /him money borrow get-PAST-you] see-PAST-1Sg
I saw the man [who you borrowed money from (⸺ /*him)].

RPs are pronominal variables occurring in positions from which movement has taken place. Whereas in some languages RPs and traces alternate freely, in English, "their distribution is very limited and appears to be influenced by linear distance, depth, and extractability (i.e., whether a trace is acceptable)" (McKee & McDaniel, 2001, p. 114). In other words, the larger the distance between the relativized position and the head noun, the more likely an RP would occur in place of a gap.

As noted above, unlike English, which only allows gaps in one-level embedded RCs, Persian allows both gaps and RPs in these structures depending on the relativized position. So, English possesses the narrower grammar and is a subset to Persian regarding this syntactic element. In this

way, when Persian learners start learning English, they already have access to a wider grammar and, based on the Subset Principle (Berwick, 1985; Wexler & Manzini, 1987), may   accept RPs in their L2.

Tsimpli and Dimitrakopoulou (2007), referring to the difference between LF-interpretable (features with semantic import, hence visible at LF (Logical Form) interface) and LF-uninterpretable (features having no role at LF with just syntactic import and possibly PF (Phonetic Form) realization) features, proposed the Interpretability Hypothesis (IH henceforth). This hypothesis argues for the unavailability of uninterpretable features in SLA after the critical period. In other words, pointing to resistance against resetting the parametric values related to the uninterpretable features in, they claim that because of "persistent, maturationally-based L1 effect" acquiring the uninterpretable features of L2 input is very difficult for adult learners, but the interpretable features are highly accessible (p. 217). Of course, this claim has not been unchallenged. Another group of researchers claim that L2 learners have access to all features in the L2 input (e.g., Lardiere, 2009).

Tsimpli and Dimitrakopoulou (2007) proposed that because of the inaccessibility of uninterpretable features after the critical period, L1 parametric values associated with these features cannot reset. Méndez and Slabakova (2012) argue that this may cause the L2 learners to use "morphology of L2 with the feature specifications of their L1" and develop a grammar different from native speakers (p. 2). There is no such problem for LF-interpretable features and they are accessible regardless of the age of acquisition.

RPs are among the uninterpretable features (Chomsky, 1995; Kong, 2011; Rezai, 2011; Tsimpli, 2006; among others) and, based on IH, not available to adult learners in SLA (Tsimpli & Dimitrakopoulou, 2007). The IH has been appraised by some researchers (Kong, 2011; Mendez & Slabakova, 2012; Rezai, 2011) investigating the status of RPs in the interlanguage of L2 learners mostly focusing on the acquisition of interrogative structures. But there is not any research on the appropriateness of this hypothesis for the acquisition of RCs by Persian learners. Based on obvious differences between Persian and English, if the IH holds true, the prediction is that Persian adult learners would not be able to set the appropriate parameter for RPs in English RCs.

Most of the hypotheses of language acquisition have studied acquisition focusing on the role of single factors and elements (Filipović & Hawkins, 2013). For instance, Pienemann (1998 & 2003) in his Processability Theory associates acquisition with the architecture of the processing capacity; or Tsimpli and Dimitrakopoulou (2007) in their IH refer to the unavailability of uninterpretable features after puberty. But, some researchers believe that

language acquisition cannot be explained by a single factor without considering the role of other factors at the same time. For instance, Gell-Mann (1992) points to the interaction of multiple factors in producing different kinds of interlanguage; and Filipović and Hawkins (2013) arguing for the role of multiple factors in SLA introduce CASP (complex adaptive system principles) model containing multiple interacting principles. They claim that to investigate SLA, factors such as "typological relationship between L1 and L2, general principles of learning and critical ages, general principles of language processing (production and comprehension), social factors . . . , as well as pedagogical factors including teaching methods and materials and types of assessment" (p. 146) should be taken into consideration.

CASP explains different levels of SLA based on four general principles: a. Minimizing learning efforts; b. Minimizing processing efforts; c. Maximizing expressive power; and d. Maximizing communicative efficiency. It asserts that negative transfer can keep on as far as it does not impede expressive power and communicative efficiency and can be tolerated by the hearer. Based on CASP, we can make some predictions about the results of the present study. Based on **a** and **b**, the learners tend to use structures which need the least amount of effort. Thus, we predict that Persian learners frequently use RPs in their interlanguage especially at low levels. Because of the ungrammaticality of RPs in subject RCs in both languages the prediction is that they face less difficulty in recognizing the ungrammaticality of RPs in this RC type than object and object-of-preposition RCs. Based on principles **c** and **d**, the more proficient learners who are more concerned about optimal communication are predicted to use fewer RPs.

The aim of this study is to scrutinize the interlanguage of Persian learners of English focusing on the status of RPs in their L2 RCs. The data obtained from two developed tests are analyzed to assess some theories such as the Interpretability Hypothesis, Subset Principle, Multiple Factors in Language Acquisition, etc. To do this, Persian speaking English learners at different proficiency levels and a group of English native speakers are compared regarding the use of RPs in three English RC types (subject, object, and object-of-preposition). Specifically we are investigating the effect of L1 at lower proficiency levels and whether this effect will disappear at a more advanced level of L2 proficiency.

2. Method

2.1 Participants

The participants included 221, male and female, randomly selected L2 learners studying English literature, nursing, architecture, and physical education at different universities in Iran (Islamic Azad University, Sabzevar School of Medical Sciences, Shahid Rajaee Technical and Vocational College of Kashan, and University of Tehran). Their mother tongue was Persian and had started learning English after the age of 13. Their ages ranged between 18 and 35. Eighteen adult native speakers of English from Oklahoma State University and University of Kentucky serving as the control group participated in this study. The only language these participants knew was English and just three of them reported that they have some familiarity with another language, such as French or Spanish.

The L2 learners were given the Oxford Quick Placement Test (OQPT; developed by Oxford University Press and University of Cambridge Local Examinations Syndicate) to determine their level. The outliers were excluded. Different filters were used to select only those participants who had taken the tests seriously. In this way, there remained 111 L2 learners plus 18 English natives. The L2 learners were divided into 4 levels. In the long run, there were 36 participants in the elementary, 26 ones in the lower-intermediate, 31 in the upper-intermediate, and 18 in the advanced level, along with 18 English native speakers who knew no language other than English

2.2 Instruments

2.2.1 The grammaticality judgment test

The grammaticality judgment test (GJT, henceforth) included 65 sentences with two options in front of each: grammatical and ungrammatical; the participants were asked to select one of the options based on the grammaticality status of the sentences. The first five sentences served as warm ups. Half of the remaining 60 sentences were test sentences and the other half were fillers. The 30 test sentences were divided into three sets; each set had ten sentences allocated to each RC type: five with RPs and five without RPs. As for the 30 fillers, half were grammatical and half ungrammatical. To control for the animacy effect, all NPs in subject and object positions were animate. In all the test sentences, RCs modified the direct object of the matrix sentences and the relative pronoun "who" was used for all the RCs. The reliability of the test turned out to be .88 based on KR-20 formula. Examples are provided below.

Subject RC

     (4) a. I know the man who drives the car.[-RP]

       b. *I know the man who he drives the car.[+RP]

Object RC

     (5). a. She loves the boy who we met yesterday.[-RP]

       b. *She loves the boy who we met him yesterday.[+RP]

Object-of-preposition RC

     (6) a. They arrested a man who she worked with.[-RP]

       b. *They arrested a man who she worked with him.[+RP]

To control for the ordering effect, three versions were provided with different orders of the test sentences. The test sentences were distributed randomly. The vocabulary used in the test was selected from words familiar to the participants and they were allowed to ask the meaning of the words they did not know.

2.2.2 The production test

The production test was a translation test which required the participants to translate some Persian sentences. The test had 20 sentences (12 test sentences and 8 fillers) randomly distributed. The test sentences included three [-RP] SRCs, three [-RP] ORCs, three [+RP] ORCs, and three [+RP] OPRCs.

To control for the ordering effect, the test was prepared in three versions. The production test was rated quite objectively (see the scoring system below). The reliability of the test turned out to be .89.

For each sentence the first part of the English translation, up to the RC, was provided and the participants were asked to complete it. An example is provided below:

<div dir="rtl">(7) من پسری را که شما با او بحث کردید ملاقات کردم.</div>

I met the boy…

2.3 Procedure

First, the GJT and the production test were developed and their reliability rates were determined through a pilot study conducted on 30 L2 learners at different proficiency levels. In order to make sure that the tests could validly measure what they were aimed for, easy and familiar vocabulary and structures were used and the participants whose performances were not stable on the tests were excluded through different filters: 18 through Rasch model analysis and 61 who judged both grammatical and ungrammatical RCs as incorrect.

The tests were administered by the learners' own professors who were given instructions about test administration. The first test was the OQPT test

for which 30 minutes were allocated. The GJT was given to them the next session and they had about 30 minutes to complete it. The production test was given in another session; they were given 30 minutes to translate the sentences. They were told that these tests made up part of their final score. The native group took only the GJT.

2.4 Scoring system

To determine the acceptability rate of each structure, the number of the sentences selected as grammatical by each participant for a certain RC type was considered as the acceptability rate for that structure. Each sentence selected as grammatical (correctly or incorrectly) was given a score of one and those selected as ungrammatical (correctly or incorrectly) zero. For example, the acceptability rate of subject RC with RP for student X was 2 if he selected two out of five sentences containing RP as grammatical. So the higher the acceptability rate of a structure, the more acceptable the structure is from the viewpoint of that participant. Regarding the production test, each translation without RP in the RC was scored one and each with RP, zero.

3. Results
3.1 Results obtained from the GJT

Table 1 presents the percentage of responses for each RC type with and without RP across the levels. As can be seen, whenever there is an RP in the RC, the advanced group rejects it; that is why the means are so low. But for the other groups, the means indicate that they do not consider RCs with RP as ungrammatical and the means are so high, quite like the means for RCs without RP.

Table 1. Descriptive statistics for the percentage mean of RCs with and without RP across levels

		Subject RC		Object RC		Object of prep. RC	
		[-RP]	[+RP]	[-RP]	[+RP]	[-RP]	[+RP]
Elementary	Mean	73.4	65.00	68.33	75.00	48.33	63.89
N=36	SD	22.93	28.83	19.92	24.08	29.62	26.11
Lower Int.	Mean	76.15	66.38	68.46	79.23	50.77	71.54
N=26	SD	20.1	20.83	22.75	19.17	30.58	22.03
Upper Int.	Mean	78.06	47.74	74.84	77.42	60.00	70.32
N=31	SD	20.88	34.12	23.07	26.20	29.21	31.78
Advanced	Mean	87.77	17.77	84.44	27.77	74.44	24.45
N=18	SD	21.84	29.01	22.29	41.81	24.55	36.66
Native	Mean	95.55	4.44	93.33	6.7	86.66	8.88
N=18	SD	10.96	10.96	13.71	11.88	15.34	19.67

3.1.1 Within group analysis

Repeated measures ANOVAs were performed at each proficiency level on mean percentages of responses, treating RC and RP as the within group variables. The analysis of the data from the elementary level participants showed a main effect of RC type ($F_{(2, 70)}$=13.146, *p=.000*); no main effect for RP ($F_{(1, 35)}$=1.299, *p=.262*). But the interaction between the two was significant ($F_{(2, 70)}$=3.778, *p=.028*).

The significant interaction means that RP has different effects across different RCs. Further analysis showed that RPs developed acceptability of object-of-preposition RCs (t $_{35}$=3.154, *p=.038*). This effect was not observed for subject and object RCs (*ps>.05*).

In the lower-intermediate level, the RC type had a significant effect ($F_{(2, 50)}$=5.9, *p=.000*). Quite like the elementary level, RP had no main effect ($F_{(1, 25)}$=2.345, *p=.138*). But the interaction was significant ($F_{(2, 50)}$=7.391, *p=.002*). This means that there was an asymmetry in the way RPs affected acceptability of different RCs. Further analysis showed that quite like the elementary participants, they accepted object-of-preposition RCs with RPs significantly more than those without (t_{25}=2.717, *p=.012*). But the presence of RP did not affect the acceptability of subject and object RCs (*ps>.05*).

For the upper-intermediate level, RC type showed a significant effect ($F_{(2, 60)}$=5.93, *p=.004*). RP type had no effect ($F_{(1, 30)}$=1.009, *p=.323*). But the interaction between the two tuned out to be significant ($F_{(2, 60)}$=12.319, *p=.000*). Further analysis showed that RPs reduced acceptability of subject RCs (t_{30}=3.72, *p=.000*), not object or object-of-preposition RCs (*ps>.05*). Generally speaking, the deleterious effect of RP is not uniform across different RCs, rather it adversely affects the acceptability of subject RCs only.

In the advanced level, the type of RC had no effect on the participants' performance ($F_{(2, 34)}$=1.569, *p=.223*). RP had a main effect ($F_{(1, 17)}$=30.828, *p=.000*). But the interaction turned out not to be significant ($F_{(2, 34)}$=1.597, *p=.172*). As the means clearly show, RCs with RPs across the board are less acceptable for the advanced participants.

Analysis of the English native speakers' data showed that RC had no main effect ($F_{(2, 34)}$=.418, *p=.661*), but RP had a main effect ($F_{(1, 17)}$=744.445, *p=.000*). This group's means were significantly higher when RCs had no RP. The interaction between RP and RC turned out not to be significant ($F_{(2, 34)}$=3.95, *p=.063*).

3.1.2 Between-group analysis

At this stage, the participants' performance on each of the RC types was compared. The results of the one-way ANOVAs showed that groups are different from each other in all RC types (in all analyses *P* was less than

.005). Post-hoc LSD test results showed that in RCs without RP, advanced L2 learners, though significantly better than the elementary, lower-intermediate, and upper-intermediate levels, performed similar to the native speakers. But as far as RCs with RP are concerned, advanced L2 learners' performance is similar to native speakers only in subject RCs. In object RCs with RPs, advanced L2 learners' acceptance is significantly more than the native speakers.

3.1.3 Consistency analysis

To determine the status of RP in each participant's inter-language, a consistency analysis was run. In the GJT, there were ten test sentences for each RC type divided into two sets: five with RP and five without RP.

As some variations were observed in each participant's answers to the sentences in each set, it was necessary to set a criterion based on which to determine the consistency each participant showed for a particular RC type. Thus, to determine the type of grammar each participant had regarding the status of RPs in RCs, two criteria were used. The first criterion was the consistency in their judgments for at least three out of five tokens ($\geq$60% consistency) of each set of RC types. The second criterion was stricter and was based on consistent judgments for at least four out of five tokens ($\geq$80% consistency) of structure sets. The second criterion was set because the first one may be criticized as a weak one (See Hamilton, 1996; Wakabayashi, 1996). In this way, different possibilities emerged, each having an implication about the status of RP, including:

1. The participants consistently judged a certain RC type containing RP as ungrammatical and the same RC type lacking RP as grammatical. This performance implies that they considered RPs **forbidden** in that RC type.

2. The participants consistently judged a certain RC type as grammatical, whether it had or lacked RP. It implies that they believe in **optionality** of RPs in that structure.

3. The participants consistently judged a certain RC type containing RP as grammatical and the same RC type lacking RP as ungrammatical. This performance implies that they considered RPs **required** in that RC type.

4. The participants consistently ($\geq$60%) judged a certain RC type as ungrammatical, whether it had or lacked RP. The implication was that, these participants **had not acquired English RCs**. These participants (61 participants) were excluded from the analysis.

5. As for the second criterion, some participants were not consistent enough in their judgments for one or both sets of sentences. These participants were labeled **uncertain**.

Table 2 summarizes these possibilities and their implications across both consistency criteria.

Table 2. Type of judgment and the implications

[+RP]	[-RP]	Consistency Criteria	Status of RP
U	G	(≥60%) & (≥80%)	forbidden
G	G	(≥60%) & (≥80%)	optional
G	U	(≥60%) & (≥80%)	required
U	U	≥60%	not acquired
		<80%	Uncertain
		(only for the second criterion)	

Note: G: grammatical, U: ungrammatical

3.1.3.1 RPs in subject RCs

Table 3 presents the number and percentage of participants regarding the status of RP in their grammar across levels in subject RCs through both 60% and 80% criteria. Regarding the former criterion, at all levels the percentage of those who think that RP is required is the least, compared to all the other possibilities. Moreover, there is a great difference between lower and higher proficiency groups regarding the two other possible judgments. The majority of the participants at lower levels considered RP optional but most of those at higher levels considered it forbidden. Besides, results of the stricter criterion (i.e. 80%) showed that most of the participants at first three levels were uncertain about the status of RPs in SRCs and only the advanced level participants confidently rejected all subject RCs containing RPs and accepted the ones containing gaps. Excluding these uncertain participants, the results of this criterion are in line with the former one.

Table 3. The number (percentage) of RPs in subject RCs

60% consistency criterion				
	N	Required	Optional	Forbidden
Elementary	36	6(16.7)	20(55.6)	10(27.8)
Lower Int.	26	3(11.5)	19(73.1)	4(15.4)
Upper Int.	31	3(9.7)	12(38.7)	16(51.6)
Advanced	18	1(5.6)	1(5.6)	16(88.9)
Native	18	0(0.0)	0(0.0)	18(100)

80% consistency criterion					
	N	Required	Optional	Forbidden	Uncertain
Elementary	36	3(8.3)	9(25.0)	4(11.1)	20(55.6)
Lower Int.	26	0(0.0)	9(34.6)	1(3.8)	16(61.5)
Upper Int.	31	1(3.2)	5(16.1)	10(32.3)	15(48.4)
Advanced	18	1(5.6)	1(5.6)	15(83.3)	1(5.6)
Native	18	0(0.0)	0(0.0)	16(88.88)	2(11.12)

3.1.3.2 RPs in object RCs

Table 4 shows the number and percentage of participants with different possible views regarding the status of RPs in object RCs through both criteria. As the table shows, based on the first criterion, there is a great difference between the advanced level and the other ones. Most of the participants at first three levels considered RP optional and the least percentage considered it forbidden, whereas those in the advanced group mostly considered it forbidden. Like the previous structure, the second criterion (80% consistency) showed that most of the participants at first three levels were uncertain about the status of RP in this RC type, whereas the majority of those who were certain enough pointed to no difference between the presence and absence of RP in object RCs, i.e. they considered it optional. It was just the advanced participants who confidently rejected object RCs with RPs and accepted just the ones without it. Excluding the uncertain participants, the results of this criterion are in line with the former one.

Table 4. The number (percentage) of RPs in object RCs

60% consistency criterion				
	N	Required	Optional	Forbidden
Elementary	36	7(19.4)	24(66.7)	5(13.9)
Lower Int.	26	4(15.4)	21(80.8)	1(3.8)
Upper Int.	31	5(16.1)	22(71.0)	4(12.9)
Advanced	18	1(5.6)	4(22.5)	13(72.2)
Native	18	0(0.0)	0(0.0)	18(100)
80% consistency criterion				
	N	Required	Optional	Forbidden	Uncertain
Elementary	36	1(2.8)	14(38.9)	1(2.8)	20(55.6)
Lower Int.	26	1(3.8)	9(34.6)	1(3.8)	15(57.7)
Upper Int.	31	0(0.0)	14(45.2)	2(6.5)	15(48.4)
Advanced	18	1(5.6)	2(11.1)	13(72.2)	2(11.1)
Native	18	0(0.0)	0(0.0)	15(83.34)	3(16.66)

3.1.3.3 RPs in object-of-preposition RCs

Table 5 depicts the reaction of the participants towards the status of RPs in object-of-preposition RCs. As it is clear from numbers and percentages obtained from 60% consistency criterion, great differences were observed among levels. Those at the lower levels judged RPs both required and optional with a tendency towards the former. Those at the upper-intermediate level considered RP as optional. But there is a great shift in the judgments of the advanced group compared to the other groups. They mostly rejected object-of-preposition RCs with RP and accepted the ones without it. Quite like the other two structures, the results of the analysis

based on the stricter criterion reveal that most of participants in lower levels were uncertain about the status of RPs and only those in the advanced level confidently rejected RPs. Excluding these uncertain participants, the results confirm the ones from the former criterion.

Table 5. The number (percentage) of RPs in object-of-preposition RCs

60% consistency criterion				
	N	Required	Optional	Forbidden
Elementary	36	17(47.2)	11(30.6)	8(22.2)
Lower Int.	26	13(50.0)	11(42.3)	2(7.7)
Upper Int.	31	8(25.8)	18(58.1)	5(16.1)
Advanced	18	1(5.6)	3(16.7)	14(77.8)
Native	18	0(0.0)	2(11.12)	16(88.88)

80% consistency criterion					
	N	Required	Optional	Forbidden	Uncertain
Elementary	36	6(16.7)	4(11.1)	2(5.6)	24(66.7)
Lower Int.	26	5(19.2)	5(19.2)	1(3.8)	15(57.7)
Upper Int.	31	3(9.7)	8(25.8)	5(16.1)	15(48.4)
Advanced	18	1(5.6)	3(16.7)	13(72.2)	1(5.6)
Native	18	0(0.0)	0(0.0)	18(72.23)	5(27.77)

3.2 Results obtained from the production test

From the 111 participants of the study, 95 took the production test. Table 6 presents the percentage of correct translations given by each level for each of the four structures. As mentioned before, both gaps and RPs are acceptable in Persian object RCs. As can be seen, the highest percentages of correct translations belong to the advanced learners. Besides, regarding the RC type, the highest percentages belong to the subject RC.

Table 6. Descriptive statistics for percentage mean of the correct
translations of RCs across levels

		Subject RC	Object RC		Object of Prep. RC
		[-RP]	[-RP]	[+RP]	[+RP]
Elementary	Mean	88.00	70.33	31.00	27.33
N=28	SD	27.33	30.33	33.66	30.00
Lower Int.	Mean	91.00	79.66	29.00	24.66
N=23	SD	22.33	27.66	23.00	35.00
Upper Int.	Mean	93.00	70.00	44.66	40.33
N=29	SD	22.33	31.00	44.66	43.00
Advanced	Mean	100	100	97.66	97.66
N=15	SD	00.00	00.00	08.33	08.33

3.2.1 Within group analysis

Repeated measures ANOVA results for the elementary level showed that the type of RC had a main effect ($F_{(3, 81)}$=33.39, *p=.000*). The pair-wise comparisons showed that subject RCs are significantly better than object RCs; and both are significantly better than object RCs with RP and object-of-preposition RCs. In other words, SRC>ORC>ORCRP=OPRC.

At the lower-intermediate level, too, RC type had a main effect ($F_{(3, 66)}$=44.67, p =.000). And pair-wise comparisons showed the same results as for the elementary level, i.e., SRC>ORC>ORCRP=OPRC.

RC type showed a main effect even at the upper-intermediate level ($F_{(3, 84)}$=22.335, *p=.000*). The pair-wise comparisons revealed exactly the same finding as for the elementary and the lower-intermediate levels.

However, at the advanced level, RC type had no effect ($F_{(3, 42)}$=.651, *p=.583*). The advanced participants produced all RC types at the ceiling level.

3.2.2 Between-group analysis

To see if different levels performed differently on each of these RC types, and to have a picture of the developmental pattern in learning RCs, one-way ANOVAs were conducted. No significant difference was observed among the groups in subject RCs ($F_{(3, 91)}$=.928, *p=.430*). But for all the other RC types, the level of proficiency played a significant role (all *Ps<.005*).

Post-hoc LSD results showed that in object RCs without RP, the advanced level was significantly better than all the other levels. But the other groups performed similarly.

In object RCs with RP, the same pattern arose; the advanced level had a significantly higher mean than the other levels, but there was no difference between the other levels. In other words, at the advanced level, the participants were highly accurate in translating Persian object RCs both with and without RPs into [-RP] English RCs.

As for the object-of-preposition RCs, those in the advanced level performed significantly better than the other groups. No significant differences were observed among the other groups in their performances on this RC type.

3.2.3 Consistency analysis

In the production test, there were three tokens for each possible structure of these three RC types in Persian regarding the use of RPs. To determine the status of RP in the inter-language of each participant, two criteria were used. The first criterion was based on their consistency in at least two out of three translations (about 70% consistency) of each of these RC types regarding the use of RPs. The second criterion was based on consistent translations of all

the tokens (100% consistencies) of each RC type. There were three possibilities:

    a. The participants consistently used RPs in their translations of the RC. This performance implies that they considered RPs required for that RC type.

    b. The participants did not consistently use RPs in their translations of the RC, implying that they considered RPs forbidden for that RC type.

    c. There were some participants who were not consistent enough in their translations and were considered as uncertain about using RPs in the structure. This possibility just occurred in the case of the stricter criterion and those whose consistency was less than perfect ($<100\%$) were considered uncertain.

Table 7 summarizes all of the possibilities mentioned above.

Table 7. Implications based on participants' translation of Persian RCs

Translations	Consistency Criteria	Status of RP
[+RP]	($\geq70\%$) & (=100%)	RP required
[-RP]	($\geq70\%$) & (=100%)	RP forbidden
	$<100\%$ (only for the second criterion)	uncertain

Because in Persian, object RCs are acceptable both with and without RPs, in the production test there were three tokens of each condition. So there were six sentences containing object RCs in the test. The same criteria were used to determine the consistency, i.e. consistency in 70% (four out of six) and 100% (six out of six) of their translations. Because there were six object RCs in the test, the status of RP in the inter-language of participants who used RPs in half of their translations and not in the other half, was considered as optional.

3.2.3.1 RPs in subject RCs

Table 8 shows the number and percentage of participants based on their use of RPs in subject RCs. As it is obvious from both criteria, the highest percentage of participants in each level belongs to those who consistently rendered their translations without RPs and considered it forbidden. The results of the stricter criterion also show that there are some participants at each level who are not certain about the ungrammaticality of RPs in this RC type.

Table 8. The number (percentage) of RPs in translation of Persian SRC

	70% consistency criterion		100% consistency criterion		
	Required	Forbidden	Required	Forbidden	Uncertain
Elementary N=28	2(7.1)	26(92.9)	2(7.1)	22(78.6)	4(14.3)
Lower Int. N=23	1(4.3)	22(95.7)	1(4.3)	20(87.0)	2(8.7)
Upper Int. N=29	2(6.9)	27(93.1)	1(3.4)	26(89.7)	2(6.9)
Advanced N=15	0(0.0)	15(100)	0(0.0)	15(100)	0(0.0)

3.2.3.2 RPs in object-of-preposition RCs
Table 9 illustrates the number and percentage of participants with different options for the status of RP in object-of-preposition RCs. The first criterion shows that the majority of the learners at all levels except the advanced level considered RP required in this RC type. But there is a great change from upper-intermediate to advanced; and all the learners at this level considered RP forbidden which is more native-like. The second criterion confirms the first one and just adds the number of uncertain participants at each level which shows a decrease from low to high levels. The large number of uncertain learners at lower levels shows the difficulty they face in producing correct translations of the L2 structure which is different from their L1.

Table 9. The number (percentage) of RPs in translation of Persian OPRC

	70% consistency criterion		100% consistency criterion		
	Required	Forbidden	Required	Forbidden	Uncertain
Elementary N=28	23(82.1)	5(17.9)	12(42.9)	2(7.1)	14(50.0)
Lower Int. N=23	19(82.6)	4(17.4)	13(56.5)	3(13.0)	7(30.4)
Upper Int. N=29	18(62.1)	11(37.9)	13(44.8)	8(27.6)	8(27.6)
Advanced N=15	0(0.0)	15(100)	0(0.0)	14(93.3)	1(6.7)

3.2.3.3 RPs in object RCs
As mentioned above, the classification of data from the consistency analysis of translations of object RCs regarding the use of RPs is different from the other RCs. Because there were six tokens of object RCs, the term Optional in the table refers to those who had three translations with RP and three

without. Table 10 shows the number and percentage of the participants regarding their options for RPs in object RCs through both criteria. The results of the stricter criterion show that most of the participants in each group, except the advanced group, were uncertain about the status of RP. Their uncertainty is also confirmed by the weaker criterion. On the other hand, the high performance of the advanced learners shows that they have acquired the structure.

Table 10. The status of RP in translation of Persian ORCs

70% consistency criterion				
	N	Required	Optional	Forbidden
Elementary	28	10(35.7)	8(28.6)	10(35.7)
Lower Int.	23	4(17.4)	10(43.5)	9(39.1)
Upper Int.	29	12(41.4)	3(10.3)	14(48.3)
Advanced	15	0(0.0)	0(0.0)	15(100)

100% consistency criterion					
	N	Required	Optional	Forbidden	Uncertain
Elementary	28	0(0.0)	8(28.6)	3(10.7)	17(60.7)
Lower Int.	23	0(0.0)	10(43.5)	1(3.8)	13(56.5)
Upper Int.	29	1(3.4)	3(10.3)	7(24.1)	18(62.1)
Advanced	15	0(0.0)	0(0.0)	14(93.3)	1(6.7)

4. Discussion
4.1 Grammaticality judgment test
Participants at the elementary and lower-intermediate levels consider RP mandatory in object-of-preposition RCs but optional in the other two RC types. It seems that the learners at these levels treat different English RCs differently. If they were transferring the L1 features to L2, they should not have accepted subject RCs with RP. But the optionality feature observed in object RCs seems to have its roots in their L1. The requiredness of the RP in object-of-preposition RCs also seems to have its roots in Persian. Generally speaking, the elementary and lower-intermediate participants have transferred the RP feature to their L2, irrespective of RC type. This finding is in line with the Subset Principle.

The participants at the upper-intermediate level have abandoned the use of RPs in the subject RCs but still deem it optional in object and object-of-preposition RCs. Of course, in contrast to the lower levels, they have abandoned the "requiredness" of RP in object-of-preposition RCs. As the IH predicts, they have not yet dropped the uninterpretable feature.

At the advanced level, RPs highly reduce the acceptability of all RC types. Contrary to the lower levels, the advanced learners were successful in dropping the L1 uninterpretable feature.

Comparison of the advanced participants with the native speakers shows that despite their significant difference from the lower levels, they are not as accurate as the native speakers in rejecting RPs, especially in object and object-of-preposition RCs. This is in line with the IH, and shows that even advanced learners did not completely abandon the RP.

The results of consistency analysis showed that most of the lower level participants considered RP optional in subject and object RCs, and those at advanced level had a more native-like behavior (88.9% for subject RCs and 72.2% for object RCs) but still not as well as the native speakers (100%). Regarding the object-of-preposition RCs, the lower levels considered it either required or optional (with a tendency toward requirement at first two levels and a tendency toward optionality at upper-intermediate level). Those at advanced levels again mostly rejected RPs in this RC type (77.8%) but not as well as the native speakers (88.88%).

Results of the consistency analysis through a stricter criterion revealed high levels of variation and uncertainty in lower-level participants in their judgments on the status of English RPs in all RC types. It seems that the first consistent view the learners have about the status of RPs in subject and object RCs is the optionality status. This might be due to the conspicuousness of object clitic pronouns in Persian and the learners' mistake in taking English RPs as the representation of these syntactic features. The high consistency the advanced learners showed in their rejection of RPs in these two RC types indicates that they have noticed their inaccuracy. Comparing them with the native speakers, we see that they are not treating RPs in a native-like manner (83.3% vs. 88.8% in subject RCs and 72.2% vs. 83.3% in objet RCs).

As for the object-of-preposition RCs, the trend is somehow different. Here the first consistent judgment the lower level learners make is the uncertainty of RPs; very few of them consider RP forbidden. In Persian, prepositions are never used alone and always an NP or an object clitic follows them. So, the direct transfer of this property of Persian prepositions may be the main cause of their behavior. At the upper-intermediate level, the majority of the learners notice this point and consider RPs as optional and some still deem RPs as required and it is at the advanced level that the majority of the learners (72.3%) consider them forbidden. We see the same treatment from the part of the native speakers.

4.2 Production test

At the three lower levels, [+RP] object and object-of-preposition RCs were mostly translated into English incorrectly, using an RP in the L2 counterparts. But the translation of subject and [-RP] object RCs had less RPs. This might be due to different reasons: L1 effect or just the test effect, i.e. the presence of RP in their translations is because of word by word translation.

On the other hand, the advanced learners showed 100% accuracy in their translations of [-RP] RC structures but their translations of [+RP] RCs were not perfect (97.66%).

In consistency analysis of the production test regarding subject RCs, the results of the strict criterion show that the majority of learners at all levels abandon RPs in their translations. This finding is compatible with the predictions based on the L1 effect.

Regarding the object RCs, lower level participants are uncertain about the status of RPs in RCs but at the advanced level, 93.3% of the participants consider RPs forbidden.

The results of the translation of object-of-preposition RCs showed that most of the participants were either uncertain about using RPs or considered them required which can be the result of direct L1 transfer. But at the advanced level, 93.3% considered RPs forbidden.

Since, unlike the GJT, we don't have data from the native speakers in the translation task, direct comparison with them is not possible. But the finding that the advanced learners' performance in the translation of subject RCs is 100% accurate, the 93.3% accuracy for the object and object-of-preposition RCs needs explanation. Based on IH, they have not been able to reset the parameter.

4.3 Theories
4.3.1 Interpretability hypothesis

Tsimpli and Dimitrakopoulou (2007), investigating the inter-language of Greek learners of English, proposed that resetting of the language parameters related to LF-uninterpretable/PF interpretable features cause learnability problems for L2 learners and prevent them from achieving a native-like syntax of L2 beyond the critical period. Denying the parameter resetting of RPs in the learners' inter-language, they associated learners' L2 performance with the accessibility of interpretable features, such as animacy and d-linking. Unlike Greek, Persian is quite like English regarding the interpretable features of animacy and d-linking in RCs. Animacy is distinctive in Persian personal pronouns (*u* vs. *an*). Besides, Persian uses a special wh-question word (*kodam*) for discourse-linked wh-phrases. So we cannot claim that these two interpretable features can help Persian learners

in acquiring the uninterpretable features represented by RPs. Moreover, in all the token sentences, the complex NP was the direct object of the matrix sentence and all NPs in subject and object positions were animate. So their possible effects were completely controlled in this study.

In spite of their high performance in rejecting RPs in all RC types, our advanced learners were observed to be significantly more tolerant than the English native speakers towards these pronouns in object and object-of-preposition RCs and only for subject RCs no significant difference was observed between these two groups. So their performance is compatible with the IH hypothesis and shows that they have problems in resetting the parameters represented by this un-interpretable feature. This learnability problem was also observed in the translation task. Although their performance could not be compared with that of native speakers' (native speakers only took the GJT), their performance in object and object-of-preposition RCs lagged behind the subject RCs.

4.3.2 L1 transfer

Regarding the similarities and differences between English and Persian and the role of L1 transfer in SLA, it was predicted that the Persian learners should reject RPs in subject RCs even at lower levels and accept RPs in the other two RC types, especially object-of-preposition RC. But the results of the GJT especially at lower levels are not in line with this prediction. Strangely enough, the first two levels have almost the same acceptability rates for subject and object-of-preposition RCs with RPs and the acceptability of the [+RP] object RCs are even more than these two RC types. The results of the upper-intermediate level are somehow better, and the acceptability of [+RP] subject RCs is significantly lower than the [+RP] object-of-preposition RCs. Moreover, at this level, [+RP] object RCs and [+RP] object-of-preposition RCs have almost the same acceptability rates which again is not compatible with the predictions of L1 transfer.

On the other hand, the results of the translation task are completely in line with the predictions of the direct L1 transfer i.e. there was significantly more accuracy in not producing RPs in subject RCs than the object-of-preposition RCs especially at lower levels.

4.3.3 Subset principle

Some behaviors of the Persian learners can be justified through the Subset Principle proposed by Berwick (1985) and Wexler and Manzini (1987). Considering the two languages, it can be predicted that Persian learners facing positive evidence for the presence of the gap in English RCs will know it is correct, and because of lack of negative evidence for ungrammaticality of RPs, they transfer this into their L2 and overgeneralize it to all structures even to subject RC which has gaps in their L1 and L2. The results of the GJT completely verify this prediction and show the wrong use

of RPs in all RC types especially at lower levels. But as the learners develop their proficiency and receive more input, they notice this wrong overgeneralization and improve their L2 performance. But the high accuracy of lower level participants in the translation of [-RP] Persian RCs is not in line with this hypothesis. This incompatibility can be due to task effect; they may have translated the sentences word by word and if there were an RP, they translated it and if not, there was no RP in their translation.

4.3.4 Multiple factors in language acquisition

Based on CASP model (Filipović & Hawkins, 2013) , at initial stages, minimizing the learning and processing efforts, the learners look for the easiest ways to acquire the L2. Thus, the easiest way for Persian learners of English to acquire L2 RCs is the direct transfer of L1 rules. As noted before, unlike English which only permits gaps, Persian permits both gaps and RPs in RCs. Obviously, using an RP in the RC decreases the load on memory and is easier to process, so the Persian learners generalize this rule and use RPs for all RC types, even subject RCs which allow RPs neither in English nor in Persian. But at the higher levels, to maximize their expressive power and communicative efficiency, the Persian learners notice the ungrammaticality of RPs in English RCs and gradually abandon them.

5. Conclusion

The present study was an attempt to investigate the status of RPs in three English RC types (subject, object, and object-of-preposition) in the inter-language of Persian learners of English at different proficiency levels. The data obtained from the two self-developed tests illustrated that the Persian learners at lower levels used RPs more in object than object-of-preposition RCs, a finding which is against L1 transfer effect. The learners at lower levels accepted RPs in English RCs, even when their use is forbidden in Persian, i.e. subject RCs. However, the findings suggested that as their proficiency improves, they become more native-like in rejecting RPs. The comparison of the advanced learners with the native speakers showed that they fail to achieve native-like language in all the RCs except the subject RC. In other words, they seem to be significantly more tolerant than the native speakers towards the RPs in object and object-of-preposition RCs, which supports the predictions of the Interpretability Hypothesis proposed by Tsimpli and Dimitrakopoulou (2007).

Though there is no agreement concerning the problem of the starting age for teaching L2, the findings of this study may have implications for language educators. Starting to learn a language beyond a certain age will not lead to native-like attainment.

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