

Competing grammars in language acquisition: the case of resumption in Persian relative clauses

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Abstract

Roeper (1999), Yang (2002), and Amaral and Roeper (2014) propose that all learners develop competing, even incompatible analyses of input as they work towards the target grammar. Using the term universal bilingualism, Roeper (1999) posits the existence of such Multiple Grammars (MG) and explores their role in first language acquisition. This paper discusses this proposal in the context of Persian children's acquisition of resumption. In Persian, resumption is obligatory in object-of-preposition and genitive relative clauses (RCs) (Taghvaipour, 2005) and can be used optionally in subject and object RCs (Windfuhr, 2010). This behaviour makes it an appropriate construction to study the MG approach. Data from three Persian children (ages 1;11 to 4;2) in the CHILDES database (MacWhinney, 2000) were investigated for the frequency of RCs to see if there is a preference for resumption or gap in RCs. Results show that, in spite of variation in the received input, children prefer not to use resumption in subject and object RCs. However, 100% use of resumption in object-of-preposition and genitive RCs in their production data was observed. Despite optionality as a property of the input, children's grammars appear to be categorical. Thus, children do not seem to be sensitive to variation in the input, which does not completely support Yang's (2002) claim about the role of frequency of different forms in their dominance. The results confirm the presence of competing sub-grammars (resumption & gap) in both input and output from the early levels of language exposure and production.

Key words: relative clause, resumption, multiple grammars, Variational Learning Model

1 Introduction

Roeper (1999), Yang (2002), and Amaral and Roeper (2014) propose that all learners develop competing, even contradictory analyses of input as they work towards the target grammar. The main idea of the Multiple Grammars (MG) theory (Roeper, 1999) is that the grammar of human language is composed of subsets of rules (sub-grammars). Using the term universal bilingualism, Roeper (1999) points to the co-existence of multiple incompatible rules (i.e. multiple grammars) in adults' grammar and explores their role in first language (L1) acquisition. In the process of language acquisition the grammar which is more frequent in the input dominates the competing grammars and it is ultimately more successful in analyzing input (Amaral & Roeper, 2014). In this paper, this proposal is discussed in the context of Persian children's acquisition of resumption.

Resumptive elements are pronominal elements which can occupy the gap positions left by syntactic movements in some structures. Whereas in some languages these resumptive elements and gaps 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 original position of the dislocated element and its surface location, the more likely a resumptive element would occupy the gap position. This can be related to the weakness of human short-term memory in sentence processing. For instance, sentence (1a) shows the possibility of resumptive pronouns in two-level embedded relative clauses (RCs) in English, which does not allow resumption in normal RCs (1b).

- 1) a. That's the girl who everybody thinks that I don't know that Bill likes ?-/?**her**.
b. That's the girl that Bill likes -/***her**.

Persian is a null-subject language with SOV word order. Persian RCs are NP-initial and they are obligatorily preceded by the complementizer *ke* 'that' (Karimi, 2001; Mahootian & Gebhardt, 1997; among others). Despite the somewhat unstable behaviour of Persian towards the availability of resumption in the position of displaced elements in RCs, "a personal or clitic pronoun co-indexed with the head of the relative clause" as a resumptive element can occur in almost all RC types (Abdollahnejad & Marefat, 2018). In Persian, while resumption can freely occur optionally in subject (2) and object (3) RCs in the case of emphasis on the relativized element (Windfuhr, 2010), it is obligatory in object-of-preposition (4) and genitive (5) RCs (Taghvaipour, 2005).¹ As the following example sentences show, resumption can appear as pronouns or as pronominal clitics in Persian RCs.

- 2) *nevisande-i* [*ke* -/**un** *komita=ro* *motaajeb kard(-esh)*].
writer-DEM [COMP RP:3SG committee=OM surprised did-(RESclitic:3SG)
(The writer who surprised the committee.)

¹ Abbreviations used in this paper: COMP = "complementizer element *ke* preceding Persian RCs", DEM = "demonstrative *-i* sometimes attached to head DPs of RCs", DUR = "durative aspectual prefix *mi-* attached to verb", EZ = "*Ezafe* particle *-e/-ye* connecting two nouns or a noun and an adjective", OM = "specific object marker *ra/ro/o*", PL = "plural", RESclitic = "resumptive clitic", RP = "resumptive pronoun", SG = "singular".

- 3) nevisande-i [ke komite -/**un**=ro entexab(-**esh**) kard].
 writer-DEM [COMP committee RP:3SG=OM selection(-RESclitic:3SG) did
 (The writer who the committee selected.)
- 4) nevisande-i [ke komite az *-/**un/ash** taqdir kard].
 writer-DEM [COMP committee from RP:3SG/RESclitic:3SG appreciation did
 (The writer who the committee appreciated.)
- 5) nevisande-i [ke komite ketab-e *-/**un/sh** =ro entexab kard].
 writer-DEM [COMP committee book-EZ RP:3SG/RESclitic:3SG =OM selection did
 (The writer whose book the committee selected.)

Roeper (1999) claims that, while acquiring their L1, children acquire sub-grammars all of which are compatible with Universal Grammar (UG). These grammars are manifested overtly in other languages even if they are not presumed to be typical of the target L1 grammar. Thus, the principle idea is that the child may create a grammar which is not equivalent to the adult system, but it is always consistent with UG. According to the Minimalist Program (Chomsky 1995), optionality ought not to be a property of adult grammars. However, minimalistically speaking, “access to two sub-grammars within a grammar” would be less complex and more economical than “rules with subcategories and complex exceptions” (Amaral & Roeper, 2014, p. 5). Therefore, it seems that concepts such as transfer and optionality can be accounted for by MG.

The variable behaviour of Persian RCs in terms of the resumption rule makes it an appropriate construction to study the MG approach. In this paper, the proposals regarding the co-existence of multiple grammars in L1 acquisition will be discussed in the context of Persian children’s acquisition of resumption, starting with a discussion of the notion “language” itself in Section 2. Section 3 will move on to a discussion of the fact that children receive input which is not homogeneous with respect to some learning problems. The present study and its methodology will be explained in Section 4. Sections 5 and 6 will elaborate on the results of the study and some discussion of the results. Finally, Section 7 provides the concluding remarks.

2 Language acquisition: endowment and environment

Language as a species-specific phenomenon has been viewed from different perspectives. It has been looked at as a cultural/social construct and also as the outcome of an endowment that enables humans and only humans to acquire it. From a generativist point of view, language is a natural object biologically present in human beings’ minds. Arguments from the poverty of the stimulus (Chomsky, 1986) have been the major motivation and primary logic for postulating an innate linguistic knowledge.² However, Chomsky (1981) in his Principles and Parameters Framework suggests that along with a small number of parametric choices causing morpho-syntactic variation among languages, there are a set of universal and tightly constrained principles shared by all languages. Taken together, principles and parameters can provide a deterministic account of language development,

² Specifically, the poverty of the stimulus argues that knowledge of something in “the absence of learning experience” indicates its innateness (Yang, 2002, p. 2).

where little might be left to environmental influence and children acquiring language in the sense of making use of associate-, distribution-, statistical- or rule-based-learning.

According to Yang (2002), despite the fact that children are endowed with innate linguistic knowledge, they still must acquire language through interaction with the environment (p. 4). In fact, this is the real reason why different languages are not uniform and there is variability in the acquisition of different languages and different aspects of a single language. From a biological point of view, as Yang (2002) points out, quite similar to any other organic system, language development must happen as a result of the interaction of the internal (i.e. the endowed knowledge of linguistic structures) and external factors (i.e. linguistic experiences received from the environment). Therefore, Yang tries to lay out a model of acquisition which provides an explicit description of the learning mechanisms with the relation between what is innate (UG), what is received from the environment (input), and what is acquired. Specifically, he embeds a theory of linguistic knowledge (UG) in a theory of learning from the environmental experience. Yang's (2002) Variational Learning Model considers language acquisition by postulating the existence of a set of competing grammars to match the externally received linguistic experience. Thus, Yang (2002) uses the model in (6) to represent language acquisition. In this model, S_0 is the initial state of the language learner. After exposure to enough linguistic experience from the environment (E), and through the learning mechanism (λ), this initial state changes into the final state (S_T).

$$6) \lambda: (S_0, E) \rightarrow S_T \quad (\text{Yang, 2002, p. 5})$$

Yang (2002) criticizes domain-general Generalized Statistical Models of language acquisition for minimizing the role of the initial (S_0) state and putting more emphasis on statistical distribution mechanisms which analyze the received input (p. 14). Generativist approaches, on the other hand, focus more on the properties of UG and the natural endowment (S_0) aspect of the language acquisition process. However, from the Variational Learning Model perspective both initial level (S_0) and the learning process through the received input are prominent.

Yang (2002) states that a good model of language acquisition must be compatible with what happens in reality (p. 6). Despite the claims about the role of frequency in language acquisition, particularly in the context of instance-based learning and usage-based models of language (Bybee, 2007; Ellis, 2002), it seems that there is no direct relation between the frequency of a structure in the environment and its speed of acquisition. In this regard, Yang points to the acquisition of the verb-raising rule (placement of finite verbs before negation and adverbs) by French children and the constraint on obligatory subjects in English where, in each case, children appear to be insensitive to the frequency of patterns in parental speech. Although sentences like (7) are not so frequent in adult-child speech (7-8%, in Yang's estimation based on the CHILDES database), French children, as Pierce (1989) points out, show signs of its acquisition from a very early age (18 months).

$$7) \text{ Jean voit souvent/pas Marie.} \\ \text{ Jean sees often/not Marie} \\ \text{(John often sees/does not see Marie.)} \quad (\text{Yang, 2002, p.7})$$

On the other hand, the obligatory-subject rule is acquired very late by English- and German- learning children. Despite the robust frequency of overt subjects in adults' speech to children, sentences such as (8a) and (8b) are very common in children's language in the period between 2 and 3 years of age (Yang, 2002, p. 7). In fact, as pointed out by Valian (1991) and Wang et al. (1992), about 30% of the sentences at the age of 2 have dropped subjects and children do not completely acquire the adult constraint requiring overt subjects until the age of 3.

- 8) a. (I) help Daddy.
 b. (He) dropped the candy. (Yang 2002, p.7)

According to Yang's Variational Learning Model, a child's grammar is composed of a collection of potential adult languages. Specifically, he claims that the difference between child and adult language is in their competence. This claim is quite in line with the Continuity Hypothesis (Macnamara, 1982; Pinker, 1984) which states that the cognitive system of children and adults are identical.³ Yang believes that the differences between child and adult languages are caused by "differences in the organization of a continuous grammatical system", because they both are constrained by the same principles and rules (UG) and "every utterance in child language is potentially an utterance in adult language" (p. 12). Therefore, the finiteness of possible human grammars (Principles and Parameters Framework) and the accessibility of UG-defined grammars to the child from the first levels of acquisition (the Continuity Hypothesis) are the main assumptions of this grammar competition model to describe the "non-uniformity and the gradualness in child language" (Yang, 2002, p. 26).

According to Yang's model, the child begins with a grammar G_i with the weight or value of P_i and analyzes the input element with this grammar. If successful, G_i will be rewarded by increasing P_i , and if not, G_i will be punished by decreasing its weight. Based on the model, all the UG-defined grammars (G_i to G_n) are in competition to gain more prominence. The reward and punishment of different grammars will continue until these P values for all options are stabilized and there is no change of values anymore. These P values can be anything from zero to one, in which zero means the grammar is totally absent in the input and one means that we have an idealized input situation that all the structures totally match the grammar option G_i . Additionally, there is the term "penalty probability (c_i)" in this model which points to the probability of failure of each grammar to analyze a structure presented by the input. Specifically, the penalty probability (c_i) is the percentage of the input sentences incompatible with G_i .⁴

³ Accordingly, differences in acquisitional or cognitive mechanisms cannot be the cause of possible language differences between the grammars of children and adults.

⁴ In his Variational Learning Model, Yang (2002) also proposes the concept of *signature* as the frequency of unambiguous evidence of a parameter in proportion to the input (p. 39). This means that the more frequent unambiguous tokens of a rule in the input will result in earlier acquisition. Through this construct, he justifies the late acquisition of the V2 rule by German children. Since the only unambiguous evidence for V2 in the input are the cases where the verb is followed (non-locally) by the object or some other VP-constituent and precedes (locally) the subject of the sentence and because such forms are not so frequent in the child directed speech (1.2%) its acquisition will be delayed.

3 Heterogeneity of input in L1 acquisition

In this section, the fact that children receive input which is non-homogeneous with respect to some learning problems will be discussed, raising questions such as: How do they identify relevant input? For instance, children acquiring English as their first language will likely hear lots of utterances without an overt subject, but they also hear utterances with subjects; and children acquiring Persian will encounter utterances with and without resumption. How does a child decide which utterances matter when determining whether subject or resumption is required? In other words, how is the relevant input set determined?

Recall that the MG theory proposes that the child builds multiple sets of rules (sub-grammars) during the process of language acquisition. Amaral and Roeper (2014) claim that the child facing “contradictory information” in the input cannot make “a uniform set of rules that captures all of the information” (p. 5). Therefore, the child must first notice the different possible options then decide which cluster of properties to select. Accordingly, children “keep track of multiple options” which means that they compute multiple analyses of a single input (Amaral & Roeper, 2014, p. 10).

Almost all languages contain some properties in their grammar which cannot be captured by a single set of non-contradictory rules. Roeper (1999) claims that the co-existence of such properties implies that development cannot be captured by a model in which one stage (one grammar) is replaced by a completely different grammar at a subsequent stage. Instead, learners retain memory for early stages as partial grammars. It is this presence of multiple systems which Roeper (1999) calls *Theoretical Bilingualism*. He points to the simultaneous use of incompatible features of grammar by children as evidence that there is no total substitution of different stages during the acquisition process. As he states, in the case of early levels of L1 acquisition, the child uses the Language Acquisition Device (LAD) to build the Initial Grammar. This simple and primary set of rules built by UG is called the Minimal Default Grammar. The structures produced by this grammar can be different from the adults’ language, but they are UG-constrained. With exposure to input, the child can modify this grammar to make it similar to adult language. According to MG, this modification does not mean that the previous forms are removed from memory, but instead may stay there indefinitely. Yang (2002) believes that among the infinite number of possible grammars, the child selects the grammar (complex or simple) that is most consistent with the available input (the most frequent and productive grammar). This means that different children could acquire unique grammars if their input is sufficiently different.⁵

The pro-drop parameter and the behaviour of L1 learners regarding this parameter have interesting implications for the possibility of multiple grammars in L1 acquisition. In the case of pro-drop languages (e.g. Spanish, Persian, etc.), it can be assumed that children starting with the assumption that an overt subject is mandatory will modify their hypothesis after encountering pro-dropped tokens in the input and will come to the conclusion that the overt subjects can be dropped in their language. In the case of non-pro-drop languages (e.g. English, German, etc.), since there are lots of token sentences without

⁵ This claim is similar to the Motherese Hypothesis (Snow & Ferguson, 1977) and in contrast to the idea that with UG, language acquisition is “deterministic” (see Grimshaw, 1981).

an overt subject (e.g. *wanna go*) in the input, children might also make the same modification. However, input sentences containing semantically vacuous expletives (e.g. *there*) in subject position cue to the child that the language is non-pro-drop. Additionally, since the pro-drop forms are not as common as the non-pro-drop structures in the input for a language like English, the child notices that the latter is more productive. Therefore, in both cases of pro-drop and non-pro-drop languages, children are exposed to both forms simultaneously. Regardless of whether pro-drop or non-pro-drop is the default grammar, it seems that the claims regarding the co-existence of multiple grammars can sufficiently explain the L1 acquisition process.

4 This study

This paper investigates the acquisition of resumption rules in RCs by Persian-speaking children. Unlike English, which generally does not allow resumption in single-clause RCs, Persian sometimes does and sometimes does not show resumption depending on the RC type. Resumption is optional in object RCs, and obligatory in object-of-preposition and genitive RCs (Taghvaipour, 2005). Although resumption is not so commonly used in subject RCs in Persian, it can be used in cases of emphasis on the relativized element (Windfuhr, 2010).⁶ Thus, both gap and resumption are acceptable in subject and object RCs in Persian, while only resumption (not gap) is grammatical in object-of-preposition and genitive RCs. It should be noted that resumption can appear as pronoun or pronominal clitic in Persian RCs.

According to the Noun Phrase Accessibility Hierarchy (NPAH) proposed by Keenan and Comrie (1977), subject and object RCs are more accessible and easier RC forms to be acquired by children. Since in Persian both of these structures can optionally have either resumption or gap (Windfuhr, 2010), investigation of the order in which children acquire these structures can help us to have a clearer view of the possibility of the presence of multiple grammars and their acquisition order. Considering that resumptive elements in Persian appear to be optional in some cases and obligatory in others, resumption is an appropriate construction for studying the MG approach which, recall, is trying to eliminate optionality as a property expressed in lexical entries. The goal is to see whether Persian L1 children begin with resumption or gaps in their RC structure production.

4.1 Methodology

Data from three Persian children (Family, 2009) in the CHILDES database (MacWhinney, 2000) were investigated for the frequency of RCs. Table 1 shows the information about the children: their sex, age at the beginning of the study and at the end, as well as the number of speech recordings the number of people speaking to the child or in the presence of the child.

⁶ This is actually in line with the data of the three children discussed in this paper in which cases of subject RC with resumption were observed. Therefore, in this paper resumption in subject RCs is considered optional, quite like object RCs.

Table 1: The information of the children in the study

	Sex	Age (start)*	Age (end)*	No. of recordings	People talking to the child
Child 1	Female	1;11.21	2;10.21	31	Parents and babysitter
Child 2	Male	5;7.29	6;6.17	31	Parents
Child 3	Female	4;1.12	4;2.28	14	Parents

*year; month, day

Four different types of RCs are focused on in this study, i.e. subject, object, object-of-preposition, and genitive RCs. All the transcripts of the child-parent speech were looked at for all forms of these four RC types. Among them, the tokens containing resumption (pronoun or clitic) were identified as the resumption cases and the rest as instances of gap. Since all Persian RCs begin with the complementizer *ke* 'that', the transcripts were searched for this element to spot the instances of RC. However, because RCs are not the only structure in Persian which contain the word *ke*, the researcher as a near native speaker of Persian scrutinized the texts carefully to determine the RC forms.

Child 1 was selected to see the status and frequency of resumption in the child directed speech at the early levels of speech production, although she could not make complex structures such as RCs, yet. Children 2 and 3 with the age span of 4 to 6 were selected to investigate the status of RCs at early levels of complex structure production. It should be noted that data from a child between the ages of 3 to 4 are not available in the corpus to compare with the performance of the selected children. Accordingly, no information on the earliest stages of RC use can be provided in this paper.

5 Results

The cases of all four RC types with and without resumption (pronoun and/or clitic) were observed in the dataset (input and/or output) of the three targeted children in this study.⁷ Example sentences (9) to (12) below are some of the RC tokens containing forms of resumption (i.e. resumptive clitics) from the observed data of the three children of interest in the CHILDES database. As mentioned before, in Persian, subject and object RCs can optionally have resumption (9 & 10, respectively) or gap, while object-of-preposition (11) and genitive (12) RCs require resumption. The resumptive element is bolded in each example sentence.

- 9) taromar-eshun kard afrad-esho [ke (ham-**ashun**) div budan].
 extermination-3PL did members-3SG that all-RESclitic:3PL monster were
 (She/He exterminated all her/his team members who were monsters.)
- 10) un maqale [ke man tarjom(-**ash**) kard-am]
 that essay that I translation-RESclitic:3SG did-1SG
 (That essay which I translated.)

⁷ It needs to be mentioned that any possible differences between the acquisition and availability of resumptive pronouns and resumptive clitics are not the focus of this study and both cases are counted as resumption tokens for the purposes of this study.

- 11) ahanroba faqat be chiz-a-i [ke tu-**shun** ahan dar-an mi-chasb-e].
magnet only to thing-PL-DEM that in-RESclitic:3PL iron have-3PL DUR-stick-3SG
(A magnet only sticks to things which have iron in them.)
- 12) hamun film-e [ke xod-emun dastan-**esh** =o goft-im]
same movie-DEM that self-1PL story- RESclitic:3SG =OM told-1PL
(The same movie that we told the story of)

All the RCs in the input or produced by these three children (output) were counted and the percentages of those containing resumption or gap were calculated (Table 2). Because Child 1 was very young and could not make complex sentences (e.g. RCs), there is no output data for her. Children 2 and 3 have both input and output data which are depicted separately in the table. As the table shows, subject and object RCs have the highest frequencies (140 & 96 tokens, respectively), a few of which contained resumption (2 & 3 tokens, respectively).

Table 2: Percentage (token count) of different RC types with gap or resumption in the input and output data

			All RCs	Subj RC	Obj RC	Obj-of-prep RC	Gen RC
Child 1	Input	Gap	92.78 (77)	100 (44)	97.06 (33)	0	0
		Resump	7.22 (6)	0	2.94 (1)	100 (1)	100 (4)
Child 2	Input	Gap	97.73 (43)	100 (28)	93.75 (15)	NA	NA
		Resump	2.27 (1)	0	6.25 (1)	NA	NA
	Output	Gap	87.18 (34)	100 (16)	100 (18)	0	0
		Resump	12.82 (5)	0	0	100 (1)	100 (4)
Child 3	Input	Gap	76.82 (53)	94.12 (32)	95.46 (21)	0	0
		Resump	23.18 (16)	5.88 (2)	4.54 (1)	100 (7)	100 (6)
	Output	Gap	72.73 (24)	100 (18)	100 (6)	0	0
		Resump	27.27 (9)	0	0	100 (5)	100 (4)
Total	Gap		86.2 (231)	98.58 (138)	96.88 (93)	0	0
	Resump		13.80 (37)	1.42 (2)	3.12 (3)	100 (14)	100 (18)

As the table shows, only 7.22% of the input RCs for child 1 contained resumption. It contains 2.94% of all the object RCs plus all the presented object-of-preposition and genitive RCs (not quite as frequent in the input, i.e. 1 and 4 tokens, respectively). None of the subject RCs spoken to Child 1 contained resumption which may indicate a penalty probability of 100 for resumption in subject RCs in the child's grammar.

In the case of Child 2, the data show that 2.27% of the input contained resumption among all types of RCs. No evidence of object-of-preposition and genitive RCs were observed in the input and all the cases of resumption were only in object RCs (6.25%). This child used resumption in 12.82% of his RC production, all belonging to the RC types requiring resumption, i.e. object-of-preposition and genitive RCs. For Child 3, resumption was present in almost a quarter of all the RC tokens in the input. Again, all object-of-preposition and genitive RCs contained resumption and each of the subject and object RCs were used with resumption in almost 5% of the cases (5.88% & 4.54%, respectively). Child 3's output, on the other hand, shows 27.27% of resumption in all RC types together. Quite

like Child 2, she also uses resumption in all her object-of-preposition and genitive RCs and no use of resumption was observed in her production of subject and object RCs.

Additionally, the total data show that subject and object RCs in the majority of the cases were used without resumption (98.58% & 96.88%, respectively) and no case of ungrammatical object-of-preposition and genitive RCs (i.e. without resumption) was observed, neither in the input nor in the output.

6 Discussion

In this paper, the acquisition of resumption in Persian RC structures is discussed in terms of data from three Persian children from the CHILDES database. In the input of the second child, only 2.27% of all the received RCs contain resumption. The third child has a more adult-like condition and has 23.18% probability of resumption among all forms of RC types in the input. This indicates the heterogeneity of the input and the presence of multiple (at least two) grammars. Although there were no object-of-preposition and genitive RC tokens in the recorded input of the second child, he used resumption in all his productions of these RC types. It shows the acquisition of the resumption rule. Since this study has considered the input only in a very limited time frame, no claims can be made about the previous input this child might have received. However, the important conclusion which can be made about the second and third children is that, regarding their production, it seems that despite the presence of both gaps and resumption in the input (i.e. heterogeneous input), they have both acquired the resumption rule and noticed the necessity of resumption in object-of-preposition and genitive RCs.

The results show that the frequencies of subject and object RCs were higher than for object-of-preposition and genitive RCs. Since the use of resumption in subject and object RCs is optional in Persian (i.e. it is used more to emphasize the subject or object, respectively), not many cases of resumption were observed in the whole data (13.80% total and only 4.52% in subject and object RCs together). For Child 1, only about 7% of all RCs in recorded input contain resumption. Therefore, it can be concluded that gaps in RCs are the dominant form with a penalty probability of only 7% in the case of this child. Now the question is whether this relatively small amount of resumption tokens is enough for the child to notice and acquire resumption in Persian RCs, especially for the RC types where resumption is required. Although all the tokens of object-of-preposition and genitive RCs in her input were grammatical (with resumption), the number was so small (only 5 tokens) that it does not seem to be enough to acquire this form. Considering her young age and that she could not produce RCs yet, no claims can be made about the acquisition of resumption by this child. However, the presence of both resumption and gap in the input confirms the claims of Multiple Grammars theory and Variational Learning Model regarding the co-existence of incompatible forms in the input.

Another important thing which must be noted here is the significant difference in the age of the children in this study. The first child who is almost three years old did not produce any RC types (at least in the limited time frame considered in this study), but Children 2 and 3, who were in the age frame of about 4 to 6, showed the ability to produce the difficult RC types of object-of-preposition and genitive with the accurate use of resumption. Thus, it seems that the Persian children start the production of different RC

types between the ages of 3 and 4. Despite only 2% of resumption in the input, Child 2 uses resumption in about 13% of his RC productions. He may have already received more evidence of resumption helping him to notice that the possibility of resumption is more than just 2%. In the case of Child 3, the percentages of resumption in input and output are very similar, 23.18% and 27.27%, respectively. This can be used to confirm Yang's ideas about the *P* value or weight of each grammar which is determined by the received input. Here again, the dominant form is using gaps instead of resumption, but in about one fourth of the cases the child uses resumption which is quite in line with the percentage of resumptions they receive in the input.

According to the Noun Phrase Accessibility Hierarchy (NPAH) proposed by Keenan and Comrie (1977), there is an accessibility order of RCs based on their relativized position, i.e. grammatical function of the relative pronoun in the RC. (13) depicts the order of RC accessibility based on NPAH. Based on NPAH, if in a language a noun phrase can be relativized in a given grammatical position in the hierarchy, then the noun phrases in any position higher in the hierarchy can also be relativized (Hyltenstam, 1990). Regarding NPAH and its predictions on the acquisition of RCs, Gass and Selinker (2008) argue that "considering the Accessibility Hierarchy (AH) from the point of view of learnability, if difficulty is at the base of this universal, we would expect learners to learn to relativize according to the ordering of the AH positions" (p. 377). Based on their empirical studies, Gass (1982) and Eckman et. al. (1988) point out that because the knowledge of more difficult structures must involve the knowledge of easier ones, if a learner acquires a specific type of RC, they would also acquire the higher RCs in the hierarchy (i.e. the easier RCs). In other words, generalizations occur from the more marked (i.e. more difficult, less accessible) to the less marked (i.e. less difficult, more accessible) RCs (Croteau, 1995, as cited in Gass & Selinker, 2008). Therefore, according to the NPAH and considering 100% accuracy in the performance of Children 2 and 3 on object-of-preposition and genitive RCs, it would be concluded that they have already acquired subject and object RCs and the optionality of resumption in these forms, because the latter are higher in the hierarchy proposed by NPAH.

13) Order of relative cause accessibility in the NPAH:

Subject RC > Direct Object RC > Indirect Object RC > Object of Preposition RC >
Genitive RC > Object of Comparison RC (> means more accessible than)

In spite of the optionality of resumption or gap in Persian subject and object RCs, generally the preference is not to use resumption in these forms, especially in one-level embedded RCs. Both input and output data of our participants clearly show this point. The frequency of resumption in these two RC types is between 2 to 6 percent in the input for the children. Despite few samples of resumption in these RC structures, no evidence of resumption in subject and object RCs were observed in the output of Children 2 and 3. It seems that children prefer not to use resumption when they think it is not required despite its presence in the received input. This implies that despite optionality being a property of adult input to children, their grammars appear to be more categorical. Once the sentences are broken into sub-categories (i.e. subject & object RCs vs. object-of-preposition & genitive RCs), categorical analysis is suggested and the children are treating the variation within the first category as noise. Specifically, regardless of the variation within subject and object RCs

in the input (gap vs. resumption), children do not categorize this variation and always use gap in them. Thus, children do not seem to be sensitive to this variation in the input which does not support Yang's (2002) claim on the role of frequency of different forms in their dominance. All in all, the results of this study confirm the presence of competing sub-grammars (resumption and gap) in both input and output from the early levels of language exposure and production.

7 Conclusion

In this paper, two acquisition models (i.e. Theoretical Bilingualism/Multiple Grammars, and the Variational Learning Model) which propose the co-existence of multiple sub sets of grammars instead of one complex grammar with several options were discussed. The acquisition of resumption as a case of optionality by Persian children was investigated and discussed through the MG and Variational Learning Model models. Results show that, despite the presence of resumption in the received input, the children notice its optionality in normal cases of subject and object RCs lacking emphasis on the relativized element and prefer not to use resumption in such cases. However, 100% use of resumption in object-of-preposition and genitive RCs in the child production data was observed, which points to the presence of both resumption and gaps in the grammar of the Persian children and is in line with MG. Despite optionality as a property of adult input to children, their grammars appear to be categorical. Once the sentences are broken into sub-categories, categorical analysis is suggested and the children are treating the variation within the category (including subject and object RCs) as noise, i.e. linguistic information that is not vital to their interpretation of the input. Yang's (2002) frequency claims are not entirely supported however, as children are not shown to be sensitive to the variation in the input. All in all, the results of this study confirm the presence of competing sub-grammars (resumption and gap) in both input and output from the early levels of language exposure and production.

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