Wh-acquisition: A Cross-linguistic Comparison of Persian and English

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ABSTRACT

This research aimed to provide insights into L1 acquisition with respect to the formation of Wh-questions by a Persian and an English child. Similarities and differences concerning the variety of patterns produced (both adult-like and non-adult-like) and the frequency and emergence order of each pattern/ Wh-word were taken into consideration. Based on the findings, it is argued that the Persian grammar licenses a wider range of Wh-questions patterns. Besides, unlike the prevalent in-situ state of the Wh-structure in Persian, the present study indicated it to be mostly Wh-fronted in the data production of the child at the specified developmental stages. Moreover, the English child exhibited more instances of non-adult production which can be justified by the higher complexity of the structure in English, as it demands both dislocation of the Wh-word and inversion. The findings of this study can help speech therapists and parents develop more understanding of the children's language development process.

KEYWORDS: Acquisition; Wh-words; Persian grammar; English grammar

1. Introduction

The way that a child acquires a language has always been a fascinating topic for research in different fields of study, particularly enjoying a specific focus on linguistics. Concerning the Persian language, a number of textbooks on Persian grammar have been published (e.g. Bateni 1995, Gholam-Alizadeh 1995, Lazard 1992, Mahootian 1997, Vahidian Kamyar & Emrani 2000) or the description of the Persian grammar has been provided through the analysis of adult Persian speakers (e.g. Dabir Moghaddam 1982, 1985; Rezaie & Zareifard 2016, Shahsavari & Dabir Moghaddam, 2016). In addition, an abundance of research has addressed the effects of Persian, as the first language, on the acquisition of a second or third language (e.g. Heidari Darani, 2012; Jabbari, 2018; Khany & Bazyar, 2013; Mollaie, et al., 2016; Youhannaie & Shoushtari, 1999). However, little is known about first language acquisition in Persian. To fill this gap, the present study aimed to provide an analysis of first language development in Persian, with a specific focus on the Wh-question formation.

As with other grammatical aspects, literature on Wh-structure involves providing a description of the structure in Persian (e.g. Kashefi, 2014; Karimi & Taleghani, 2007; Sadat Tehrani, 2011; Shiamizadeh, et al., 2017, 2018; Toosarvandani, 2008), a comparison of the structure in English and Persian (e.g. Abedi, et al., 2012; Gorjani, et al., 2012; Heidari Darani, 2015), or research on the effect of L1 on the acquisition of the structure in L2/L3 (e.g. Galbat & Maleki, 2014; Jabbari, et al., 2018; Mollaie, et al., 2016). However, research on how children acquire this structure is lacking. Hence, this paper aimed to

provide an analysis of the acquisition of the Wh-question formation and how variant it can be especially in the early stages. To provide more insightful information, a cross-linguistic comparison is also made with the process of Wh-structure acquisition in English.

2. Literature Review

2.1. A syntactic analysis of the structure of Wh-questions in English

According to Chomsky's minimalist program (Chomsky, 1995), questions are formed as a result of the syntactic presence in C-position of a strong question affix. According to Chomsky, Q is a strong affix, which requires checking via phonetic form. Accordingly, Q demands an overt head, which is realized by Subject- Auxiliary Inversion. In addition, Q carries a strong [+wh] specifier feature which must be checked by specifier-head agreement, forcing the movement of a Wh-operator to spec-CP. Hence, in English, object and most adjunct Wh-question formations go through three grammatical transformations. Initially, the object or adjunct of the declarative sentence (e.g. *Mary will buy the car*) is replaced by the Wh-word (e.g. *Mary will buy what?*). Next, the Wh-word moves to the beginning of the sentence (e.g. *what Mary will buy?*). Finally, there is the subject *(Mary)* and the auxiliary *(will)* inversion to produce the well-formed Wh-question (e.g. *what will Mary buy?*). In the case of subject Wh-questions, there is only the requirement for Wh-fronting and the subject-replacement by the Wh-word (e.g. *who bought the car?*).

2.2. A syntactic analysis of the structure of Wh-questions in Persian

Modern Persian, which belongs to the Indo-European family, is recognized as a pro-drop language. In Persian, pronominal subject omission is prevalent, and mostly subject is realized in the form of a verb suffix (Vaez Dalili, 2009). As an example, see the following sentence:

(1)

  Ketabha ra avardand.

  Books (Object marker) bring(Past).

  They brought the books.

  In this sentence, the subject (*anha* = they) is omitted, however it is easily identified by the native speakers from the verb ending *"and"*. This pro-drop feature is also true about the interrogatives. That is, when constructing a Wh- or yes/no question, the subject can be dropped and the verb can act as the subject indicator, too.

  Persian is generally categorized as a Wh-in-situ language (Lazard, 1992; Mahootian 1997; Youhanaei & Shoushtari, 1999). In Wh-in-situ languages, the Wh-element remains where it is produced in the deep structure. See the example (2) below:

(2)

  Ali be madrese raft.

  Ali to school went.

  Ali koja raft?

  Ali where went?

  However, the state of Wh-structure in Persian being recognized as a Wh-in-situ language has been controversial. Some linguists, such as Kahnemuyipour (2001) and Adli (2010), believed that Farsi should not be considered solely as an in-situ language in the case of question formation. Persian permits two possibilities for some Wh-structures, and in some cases, it must move to the front position of the structure (immediately after or before the subject). See the example below:

(3)

  Ali be madrese naraft chon mariz bud.

  Ali to school did not go because he was ill.

  Ali be madrese naraft, chera? *

  Ali to school did not go, why? *

Deletion of the clause (chon mariz bud) and its replacement with the corresponding Wh-expression (chera) will result in an incorrect structure. In this example, the Persian grammar does not allow the Wh-word (chera) to remain in situ and triggers movement to the front or immediately after the subject.

(4)

      Chera Ali be madrese naraft? (Why Ali to school did not go?)

      Ali chera be madrese naraft? (Ali why to school did not go?)

Thus, in Farsi, it seems that Wh-movement to the front of the structure or after the subject is necessary in some cases. For Kahnemuyipour (2001), Persian cannot be considered either a language with syntactic Wh-movement or a Wh-in-situ language; rather, it is a language in which Wh-structure needs to undergo focus movement. According to Kahnemuyipour, in Persian, post-verbal Wh-arguments and Wh-adjuncts need to move to a pre-verbal position. Kahnemuipour held that as [+wh] feature is weak in Persian, it must be triggered by an optionally realized strong [+focus] feature. As such, in Persian, the strong [+focus] feature is realized in Foc position, which is generated below CP and above TP. Consistent with this claim, Adli's (2010) study suggested that although Persian is claimed to possess a Wh-in-situ formulation, it presents a variety of word orders.

To add more into research on the formulation of the Wh-structure in Persian, the present study focused on how children acquire the structure. Other intricacies of Wh-question formation were also focused, and a comparison was made with the acquisition of the structure in English. In fact, the research aimed to set out the picture of an English and a Persian child's language development at approximately equal Mean Length of Utterance (MLU) values in the early stages (Brown, 1973), with a specific focus on detecting the patterns of correct use and errors in Wh-question acquisition, the type and frequency of the Wh-expression at each stage, and the sequence of the emergence of the variants across the two languages. More specifically, it was decided to:

1. What are the correct patterns of Wh-question structure in the production data of the? Persian and English children in general and at the specified developmental stages?

2. What is the frequency of Wh-words/variants at each specified stage and in what sequence do they emerge?

3. What are the two children's patterns of non-adult-like production, produced in their process of the acquisition of the WH structures?

3. Methodology

The data for this research came from the CHILDES database (http://childes.talkbank.org). The Persian data came from the Family Corpus, Lilia file. Lilia was a girl living in Tehran who was recorded at ages 1.11 to 2.10. The recordings were based on her mother and caretaker's interactions with Lilia, mostly in playtime activities at home. The English data were chosen from the English UK Corpus, Lara file. Lara was a girl living in England who was recorded at ages 1.09 to 3.03. Her grandmother and mother's interactions with Lora in their everyday activities were focused.

We used MLU (Mean Length of Utterance) as a simple way of making the two children's language production data comparable. In first language studies, MLU is a metric used to analyze and measure the complexity and development of a child's language skills. It provides valuable insights into how children acquire and progress in their native language. MLU is calculated by dividing the total number of morphemes (the smallest meaningful units of language) by the total number of utterances produced by the child. Morphemes can include words, prefixes, suffixes, and other grammatical elements. Utterances refer to complete statements or phrases made by the child. MLU is often used to assess various aspects of language development, such as vocabulary growth, grammatical complexity, and syntactic structures.

By analyzing MLU, researchers can track a child's language development over time. As children acquire language skills, their MLU tends to increase. This increase reflects their ability to produce longer and more complex utterances. MLU is also a valuable tool in language studies as it provides a quantitative measure to track and compare language development across different children and age groups. It helps researchers gain insights into the typical patterns of language acquisition, as well as identify any deviations or challenges that may require further attention or intervention.

In the present study, MLUs were calculated using the MLU function of the CLAN program (MacWhinney, 2000). The transcripts with MLU between 2 - 3.80 were analyzed for the purpose of the study. The data were categorized into stages based on Brown's (1973) criteria as it is presented in Tables 1 and 2.

Table 1. Brown's (1973) Classification of the stages for language development

Stages	Stage I	Stage II	Stage III	Stage IV
MLU	1.00-1.99	2.00-2.49	2.50-2.99	>3

Table 2: Classification of the research data into stages based on Brown's criteria

Child	MLU range (Stage II)	MLU range (Stage III)	MLU range (Stage IV)
Lilia (Persian)	2.020-2.460	2.60-2.830	3.520-3.820
Lara (English)	2.008-2.035	2.53-2.74	3.26-3.81

The data accessible were consistent with the second, third and fourth stages of Brown's criteria.

Repetitions, imitations, and incomprehensible structures were excluded from the analysis. The various patterns/variants were identified using content analysis. To address the reliability of coding and categorizations, inter-coder reliability (the author and a colleague) was performed. An initial analysis ensured a substantial kappa coefficient of agreement (k = .91). Double checking, further discussions between the two coders, and expert consultation were employed to come to an agreement on the points of discrepancy.

4. Results and discussion

4.1. Patterns of correct use

The first research question aimed to identify the patterns of correct use in the Wh-question acquisition of both children. Regarding the Persian data, for the questions to be correct, the Wh-word needed to be in preverbal position. The differences could be in the linear order of the direct object and the Wh-word and the position of subject, which can be either preverbal or post-verbal. As Persian, to some extent, follows a free order, various patterns of Wh-structures were predicted to be produced by the child. To categorize the Wh-question variants in Persian, the position of the Wh-word, the subject, and the object were focused upon. Taking these positions into consideration, the Wh-patterns were classified into *wh-in-situ* and *wh-word-fronted*. In this categorization, the single-word Wh-question variants –*e.g., chi* (what) or *koja* (where)– and the single-word Wh-questions preceded by a proposition –as in *Az koja?* (From where?) – or by an adverb –as in *Pas chi?* (So what?)– were categorized as Wh-fronted. According to Toosarvandian (2008), the single Wh-word question, also referred to as "sluicing", is "an elliptical construction in which all of a constituent question goes missing except for the interrogative phrase" (P. 677). This movement-plus-deletion process is nearly identical in English and Persian; however, according to Toosarvandian (2008, p. 677), "in Farsi sluicing escapes deletion not by Wh-movement as in English but by a type of focus movement."

For the English data, in the case of the copula questions, the choice and placement of the Wh-word, copula, and subject needed to be correct. for the structures including auxiliaries, the accuracy of the choice and placement of Wh-word, auxiliary, main verb, and subject was required. Hence, compared to the Persian data, due to more constrains on word order in the Wh-structure, fewer patterns were predicted for the English data. The predictions came out to be true. Different patterns and their associated frequencies/percentages for both Persian and English variants are presented in Tables 3 and 4.

Table 3. Frequency and Percentage of the Wh- variants for the Persian data

Variant	Examples	frequency	Percentage%
Wh-fronted			
Wh (single word)	Chi? (what?)	44	33.08
PrepW/AdvWh	Az koja? (from where?) / pas chi? (therefore, what?)	6	4.51
Wh~V(single word, v=be)	Kodume?(which one is?)	8	6.01
WhV	Chi shod? (what happened?)	23	17.29
WhSV	Chera in mikhore?(why this fits?)	2	1.50
Wh~VS	Kie esmesh?* (what is name-EZ her)	3	2.25
WhS~V	Kodum ahange? (which song is?)	2	1.50
WhVO	Ki dad behesh?(who gave to her?)	3	2.25
Wh(OM)V	Chera ina ro nemibare? (why these(OM) does not take?*	2	1.50
WhO(OM*)V	Chera inaro mizari?(why these put(2ⁿᵈ SIG)?)*	7	5.26
WhSO(OM)V	Chera khale niloufar mobilesho var nadasht?(Why aunt Niloufar mobile-her did not take?	2	1.50
Embedded wh	Bezar bebinam ke chi shode? (let see-1ˢᵗ SIG what has happened?)	11	8.27
	Total(Wh-fronted)	111	83.45
WH-in-Situ			
Variant	Examples	frequency	Percentage
SWh	To chi? (you what?)	4	3.00
SWh~V	In kie? (this who is?)	10	7.51
SWhV	To chi mikhori? (you what eat?)	2	1.50
AuxWhV	Mikhstim chi bokhorim?(want what eat?)	4	3.00
O (OM) Wh	Mami ro chi? (Mami (OM) what?)	1	0.75
	Total(Wh-in-situ)	21	15.78
	Total Wh-question	133	100

Table 4. Frequency and percentage of the Wh-variants for the English data

Variant		Example	frequency	Percentage(%)
Wh-fronted (Ex-situ)				
Wh(single word)		Who?/why?	11	12.22
WhAuxS		What's that? Where's daddy?	45	50.00
WhAuxSV		Where does she go?	17	18.88
WhPP		What about this one?	5	5.55
embedded clause	SV(Wh+to+V)	I don't know how to make…	6	6.66
	SV(WhSV)	You know why it is really hard?	4	4.44
Wh-Fronted (In-situ)				
WhV		Who wants that?	2	2.22
	Total		90	100

As the tables indicate, both the English and the Persian child used various types of Wh-questions; nevertheless, the Persian child seemed to produce more variable language than the English child. The single Wh-word and WhV were the most frequently used variants by the Persian child. Data also indicated the Persian[1] child's remarkably higher disposition to use Wh-fronted (83.45%), compared with the Wh-in-situ pattern (15.78 %). This seems contrary to the use of the structure by adult

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[1] * EZ stands for EZAFE; OM stands for Object Maker; SIG stands for Singular

language users, which is more frequently in the form of the Wh-in-situ structure. As such, it might be concluded that in the early stages of language acquisition, Wh-words are mostly produced in initial position.

The WH-question production of the English child, all Wh-fronted, were categorized into the *Wh-in-situ* questions –in the case of subject question– and *Wh-ex-situ* –in the case of object and adjunct questions. Wh-in-situ questions in English can also be produced by having the Wh-word in post-verbal position as in "you did what?"; however, no instances of such variant were observed in the production data of the English child studied in this research. The WhAuxV pattern, in which auxiliary is the copula *be*, seemed to be the most repeated variant produced by the child.

4.2. Frequency and emergence order of different variants at each stage

Two issues were of interest in analyzing the data at each specific stage of the children's language development. The first was the issue of determining the dominant pattern/s of Wh-structure at each stage. The second was whether Wh-words/patterns are acquired in a particular order. Results for the frequency of each pattern are presented in Tables 5 and 6.

Table 5. Frequency of the Wh-variants at different stages for the Persian data

Variant	Wh(single)	prep/AdvWh	Wh~V	WhV	WhSV	Wh~VS	WhS~V	WhVO	WhSOV	Wh(OM)V	WhO(OM)V	Embedded wh	SWh	SWh~V	SWhV	AuxWhV	
Stage II	13	2	3	8	0	0	0	0	0	1	2	2	2	4	0	0	0
Stage III	13	1	5	10	0	0	0	2	0	0	3	3	1	3	0	2	1
Stage IV	18	3	8	5	2	3	2	1	2	1	2	6	1	3	2	2	0

Table 6. Frequency of the Wh-variants at different stages for the English data

Variant	Wh(single word)	WhAuxS	WhAuxSV	WhPP	WhV	Embedded Wh	
						Wh+to+V	WhSV
Stage II	2	32	0	0	0	0	0
Stage III	1	8	5	3	0	2	0
Stage IV	8	5	12	2	2	4	4

In the case of both children, the Wh-question variations increased steadily in number along the data points. In the case of the Persian child, single Wh-word and WhV were found to be the most frequently-used variants at all stages investigated. WhV pattern in Persian is possible for both object and subject questions; however, the pattern in English is only used to produce subject question. Single Wh-word question enjoyed a constant frequency of occurrence in the production data of the Persian child at different stages with the single Wh-word *"chi"* (what) frequently used at all stages and *"chera"* (why) at the third and fourth stages. There seemed to be an increase in the number and complexities of the embedded clauses at later stages, as well.

In the case of English, the second stage was predominantly characterized by the WhAuxS pattern, though including just a few fixed expressions (e.g. *what's that, where is...?)*. This is in line with the Persian child's production at this stage. This can be explained via the pragmatic function of the Wh structure, which seems to be mostly aimed at obtaining information at earlier ages. In stage III, she seemed to produce a variety of questions but she occasionally omitted auxiliaries and/or did not have subject-auxiliary inversion. This stage was mostly characterized by the use of *be*, *do,* and *does* auxiliaries. By stage IV, more auxiliaries appeared and longer and more complex structures –including more embedded clauses were produced. As Table 6 indicates, embedded clauses at the third stage were mostly in the form of SV (how +to +V) as in *"you know how to make it".* At stage IV, we also see instances of SV (Wh SV) structure, e.g., "*you know why it's really hard".*

Concerning the second issue, i.e., the sequence of the emergence of the Wh-words (see Table 7), the Persian Child seemed to produce *chi* (what), *koja* (where), and *kodum* (which one) from the beginning of the data available. *Chera* emerged at the end of the second stage but seemed to be, along with *chi*, the most frequently used Wh-word in the following stages (i.e., stages III & IV). *Ki* (who) was used in all stages, but rarely. Other Wh-words were produced very rarely or not at all.

Table 7. Frequency of the use of Wh-words at each stage for the Persain data

Wh-word	Chi (what)	Chera (why)	Koja (where)	Ki (who)	Ku (where is)	Kodum (which one)
Stage II	28	2	2	3	0	3
Stage III	17	12	4	0	1	1
Stage IV	13	8	8	2	0	9

For the English child, in stage II, only *what* and *where* were used. *Why, How*, *When* and *Who* occurred very rarely in stage III, though, with the exception of *Who*, the other ones were more frequently used in stage IV (see table 8).

Table 8: Frequency of the use of Wh-words at each stage for the English data

Wh-word	what	why	where	who	how	when
Stage II	27	0	7	0	0	0
Stage III	7	1	5	1	2	2
Stage IV	3	8	14	1	6	3

4.3. Patterns of non-adult-like production

Another issue of interest in this study was to analyze the non-adult-like Wh-question production. Almost all such violations committed by the Persian child seemed to be related to the choice of the appropriate Wh-word. Examples are provided below:

(5)

a. kie* esmesh?

  Who is name her?

b. mami , mæge nemiduni emruz [/] emruz koja* *(be jaye chandom)* Shæhrivære ?

  Mami, don't you know today where (instead of what day of the month) Shahrivar

  is?

As mentioned earlier, Persian does not allow the placement of the Wh-word in post-verbal position. No instances of such error and other Wh-related syntactic errors were found in the data.

In the case of the English child, both lexical (Wh-word choice) and syntactic violations were observed

4.3.1. Wh-word Choice Errors.

Most of the lexical violations were pertinent to the misapplication of the Wh-word *What* instead of *Who*. See examples *a, b,* and *c,* below:

(6)

a.

  CHI: what'*s that?

  MOT: who is it?

MOT: It's Ronald McDonald.

b.

CHI: what*'s that?

MOT: who is it?

CHI: what*'s that ?

MOT: a little girl.

c.

CHI: what*'s that ?

MOT: what's what?

CHI: that boy

As mentioned in the previous section, *Who* emerged later in the child's acquisition process of Wh-words and even in later stages, it was used rarely. An interesting point is that in stage III, the child did the other way around and misplaced *what* with *who*. See example *d*, below:

(7)

CHI: who* are you doing?

       I'm doing Cesca. MOT:

This might indicate that the child is having challenges with the structure.

4.3.2.Syntactic Errors.

The following types of syntactic error were found in the production data of the English child.

4.3.2.1. Auxiliary omission

Auxiliary omissions refer to the violations in which the auxiliary is dropped. In such cases, tense is not overtly marked on the main verb. See the examples in the production data of Lara.

(8)

a.

CHI: when after finished we go?

MOT: pardon?

CHI: when [/] when after finished this apple I go?

MOT: go where?

CHI: go and get daddy

b.

MOT: my poor sheep.

CHI: where [?] mummy's poorly sheep gone?

MOT: you've destroyed it.

c.

MOT: you want to do this page?

MOT: right.

CHI: where it gone?

d.

CHI: who drink my tea?

CHI: who drink my tea ?

4.3.2.2. Inversion errors

(no subject and auxiliary/copula inversion). For example:

(9)

MOT: oh no.

MOT: so then they have some dinner.

CHI: what [//] why he hasn't got any dinner?

MOT: he's not hungry (be)cause he's sad.

4.3.2.3. Agreement errors

For example:

(10)

a.

CHI: who want [*] to go up the ladder?

CHI: let me make bigger than...

CHI: that's bigger than sky.

b.

CHI: where's [*] lights?

CHI: know where the lights is?

CHI: lights.

Dad: we've gotta ask mummy

There were also instances of violation for which a particular pattern could not be specified. See the example below:

(11)

MOT: they're going to bed.

CHI: who?

MOT: monkey's going to bed.

CHI: what he's [*] bed?

Taken together, based on the results obtained from the analysis of the two children's non-adult-like production, it can be concluded that in the case of Persian, the child was able to produce correct (adult-like) questions from the very beginning of the multi-word speech stage. However, this was not equally true of the English child who seemed to produce more syntactic errors even at the later stages of her language development. This is not surprising as forming English Wh-questions are more demanding as they should go through obligatory movements and require inversion, agreement, and auxiliary checking. Patterns of such violations in the English data seemed to agree that the acquisition of WhAuxS (the most frequently used pattern from

the first stage) was the easiest acquired Wh-structures. Besides, the data indicated only sporadic instances of inversion errors in their production data, that is, the child produced both un-inverted and well-formed structures throughout the same period. Such errors were observed even at later stages meaning that there was no evidence of a specific un-inversion stage. The same was true for auxiliary omission errors.

5. Conclusion

This research aimed to provide a picture of the acquisition process of the Wh-structure in Persian and English. Through the study, we compared the data production of the two children in terms of type and frequency of the correct patterns in general and at comparable stages. Non-adult-like forms of Wh-expressions were also analyzed. Different patterns for both languages were found; however, the data suggested Persian to be more variant compared to English. Another interesting finding was that unlike most claims in literature concerning the Wh-in-situ status of Wh questions in Persian, the present study indicated it to be more Wh-fronted in the case of the studied child. Preferable patterns and Wh-words at each stage were compared. The data also suggested that the Persian child had an easier path to acquire the structure compared with the English child who seemed to have more challenges and produced more syntactic violations. Findings can contribute to the existing body of knowledge on English/ Persian language acquisition and bilingualism, as well. Besides, this study can help speech therapists and parents develop more understanding of the children's language development process. However, caution should be taken in making generalization about children's acquisition of Wh-question structure for two reasons: first, the sampled data analyzed in this study comprises just a small portion of the child's speech and second, the characteristics observed might be merely individual. Hence, future studies employing larger data sets at various developmental stages and comparing sample data from more children are suggested.

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