International Academic Institute for Science and Technology

International Academic Journal of Humanities Vol. 2, No. 1, 2015, pp. 126-134.
ISSN 2454-2245

International Academic Journal of Humanities

www.iaiest.com

Asymmetry between Production and Comprehension: The Case of Subject-Verb Agreement in the Acquisition of Persian Language

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Abstract

This study is a linguistic investigation of subject-verb agreement in comprehension and production with the aim of analyzing performance of 60 Persian kindergarten children aged between 4-6. To conduct the study, series of pictures in the form of elicitation and selection tasks with a focus on animate subjects were used to examine the degree to which comprehension and production overlap in the use of language. The results of t-test indicated that almost all children's comprehension lagged behind their production. In fact, in spite of their earlier command in production, some degrees of sensitivity were spotted in their comprehension of subject-verb agreement as well. Additionally, 6 year olds were more successful in elicitation tasks with an accurate analysis of subject-verb agreement compared with the four and five year olds. The analysis of the comprehension and production patterns in typically developing children shows an asymmetry according to which it can be claimed that the relationship between these two processes is not perfectly straightforward.

Keywords: Asymmetry, Subject-verb agreement, production, comprehension, selection task, elicitation task

Introduction

A central question in the study of child language acquisition concerns the extent to which accuracy is reflected through children's production of their native language grammar. As stated by Freudenthal, Pine and Gobet (2006), children acquiring their native language face considerable complexity in understanding the system that is based on syntactic rules and categories which define those rules. An outstanding achievement is reached when a child has acquired the basic syntactic relation called subject-verb

agreement (Morgan, Barriere, & Wool, 2006) which is known as an intricate phenomenon. For languages like Persian, which are morphological agreement oriented, children are required to relate a verb and its subject to produce grammatical sentences in which features of the subject (person-number) need to be matched with the verb.

It is generally believed that mastering the native language enables the child to speak and understand a language and there is somehow a perfect asymmetry between a first language user competence in production and comprehension (Hendriks & Koster, 2010). It implies that understanding precedes producing language. This perspective is conceptualized by Eve Clark as "Comprehension must precede production. How else can speakers know which words to use to convey a particular meaning?" (as cited in Hendriks & Koster,2010, p. 2). There is a complicated dilemma related to the fact that children's ability in production falls behind their comprehension (Smolensky, 1996). Correct production of syntactic forms by children implies that they possess the appropriate grammatical rules in their production as well. However, there is sometimes a kind of divergence in children's performance both in production and comprehension, indicating an asymmetric grammar (Hendriks, Hoop & Lamers, 2005). This suggests that children's knowledge of grammar may not be as simple as it seems. Precedence of production over comprehension highlights the possibility of a reverse pattern which is generally considered to be the norm. In recent years, some studies have been published in favor of this claim. For instance, Grinstead (2000) indicated that Spanish speaking children start to produce verbal agreement at about the age of 2.5. On the contrary, studies on their comprehension revealed that the Spanish-speaking students were unable to detect verbal agreement with subject until they reached the age of 5. Other studies on asymmetry such as verb inflections have been reflected in Johnson, Villiers, and Seymour (2005) which further supported the idea that production prevail over the correct comprehension.

Asymmetry in language acquisition is not limited to verbal agreement. In testing 15 children between the ages 1.8 – 2.8, Chapman and Miller (1975) found that the children followed sub-obj order in their production by producing sentences such as "boy hit girl" rather than "girl hit boy" (in the context in which "the boy" was the subject of the sentence). However, they scored significantly less in the comprehension task where they could have used sub-obj order as a cue for answering the questions. Another area where production overrides comprehension is third person singular /s/ (Johnson et al., 2005). In their study, 62 children were examined for their comprehension and production of sentences with singular and plural verbs. The results indicated that children's comprehension lagged behind their production. In English, third person singular is considered as an agreement marker between the subject and the verb, indicating the number of subjects in the sentence.

Further evidence on asymmetry comes from the analysis of comprehension and production of relative clauses in Italian children by Adani (2009) and Utzeri (2007). They showed an asymmetry between subject and object relatives in a sense that children mastered the production of subject relatives before the objective categories. In contrast to the previous studies discussed, Fraser, Bellugi, and Brown (1963) examined the differences between singular-plural marked by auxiliaries "is" and "are". They tested children's comprehension and production aged between 3.1-3.7 by using a picture selection task and found out that the former was ahead in a way that children got higher scores on the comprehension task.

To provide an explanation for the comprehension-production asymmetry, Prince and Smolensky (2004) proposed the Optimality Theory (OT) which accounts for the child's grammar. On the basis of optimization, learners are assumed to choose the best output for a stream of given input presented to them. Smolensky (1996, p. 3) further explained that: "In 'production' what is fixed is an input; what competes are structures that share this particular underlying form. The overt expression of a given input is the overt form contained within the maximum-Harmony or optimal structural descriptions of that input. In 'comprehension', on the other hand, what is fixed is a surface form, and what competes are structures that share this given overt form". In other words, in production, input functions as a unit of meaning and

output is considered as the optimal form for that meaning. In contrast, in comprehension it is the input that becomes form and the output as the ideal meaning for that form.

Miller and Schmitt (2004) proposed a possible way in which explanation can be given for production-comprehension discrepancy. Relying on Kramer's Non-Integration Hypothesis, the findings of these researchers related to children's interpretation of scrambled indefinites indicated that their comprehension was not target-like due to limited discourse integration. Following this, Kramer (2000) maintained that comprehension may fall behind production since reconstructing the speaker's intention is a more demanding task compared with the production of utterances in which joining various ideas is required.

Another methodological concern that accounts for production-comprehension asymmetry comes from a series of experiments by Hurewitz et. al (2000) who investigated restrictive modification in the acquisition of L1. They asserted that the discrepancy is the result of children's inadequate knowledge of parsing in a sense that their delay in comprehension originates form a delay in the acquisition of the appropriate cues and the problem in integrating them.

According to Hendriks and Koster (2010), asymmetry can be resulted from four factors. First, the characteristics of the task might account for this phenomenon. The authors believed that under an artificial situation, children make errors which are unlikely to happen in a more natural condition. There are two opposing explanations for the occurrence of errors. On the one hand, Conroy et al. (2009) found out that demands of the task cause a delay when children attempt to represent their actual knowledge of grammar. They further indicated that children have the relevant knowledge of grammar, even if some errors occur in their comprehension of the task. In fact, these asymmetries are made because of children's sensitivity to the artificial condition involved in the task. On the other hand, according to Cutler and Swinney (1987) children do not have the relevant linguistic knowledge even though their production might appear flawless.

Second, asymmetries happen due to the lack of pragmatic knowledge. Here, an explanation of asymmetries assumes that while the knowledge of grammar is innate, its use which is shown in pragmatic knowledge must be learned. However, there are some approaches to pragmatics (Relevance Theory, neo-Gricean pragmatics) which have argued the innateness of pragmatic competence. The third factor considers asymmetry as a result of cognitive limitation. It is conceived that children have not only the relevant linguistic knowledge but also the grammar and its use; however, because of their cognitive limitations, they are not able to use this knowledge. Children's appropriate performance in production can be the manifestation of their knowledge of grammar which is in fact similar to adults. In comprehension tasks, however, due to children's insufficient cognitive resources, their performance is different from adults. The last factor that accounts for asymmetries can be attributed to grammar. It is argued that some models of grammar can create different kinds of relationship between form and meaning which indeed depends on their use in production or comprehension (Smolensky, 1996). Considering the directions of the sensitivities which are different in various models of grammar, it is possible to conclude that production and comprehension do not necessarily move hand in hand in language acquisition.

Number agreement in Persian

Although number agreement is among the most complex subjects in language acquisition (Lotfi, 2006), it is still an underestimated issue. He further stated that Persian has three number values including gender, singular and plural. The general number is combined with the singular which can in turn result in the generation of a general/singular versus plural marking. The singular inflection is used with the general number to indicate one single category of the entity in which its number cannot be recognized by the form.

-Onja ye livane (singular)
-There a glass is

-"There is a glass over there"

-Onja livan hast (general)
-There glass is
-"There is a glass/There are some glasses over there"

In order to mark plurality, Persian speakers use nominal marking and verb inflection. On the other hand, plural marking does not reflect the semantic category of the nominals. However, there is an exception in the case of using two plural suffixes "ha" and "an" in formal Persian where using "ha" is accepted for the whole categories of nominals whereas "an" is only possible for animate subjects. Since "an" is not frequently used in informal verities of Persian, the plural marker "ha" is used in both formal and informal situations instead. This is shown in the examples below:

-dokhtarha/pesarha [animate]
-dokhtaran/pesaran

-ghamha/delha [inanimate]
-*ghaman/*delan

In case of verbs, both singular and plural forms are marked. The suffix is determined by the person feature of the subject in the sentence. For instance, plural animate subjects are marked with plural verbs, whereas the choice of verb for the plural inanimate subjects might be singular:

-bacheha raftan daneshga.
-guys go university (past-Pl)
-"the boys went to university".

-miveha dar sabad bood.
-fruits in basket was (past –Sg)
-"the fruits were in the basket".
Based on what has been said so far, this study is an attempt to shed light on the complexity of subject-verb agreement phenomenon in Persian. It aims to investigate children's comprehension and production of a couple of sentences to check whether any evidence of asymmetry can be detected. The researchers provided children with animate subjects in the examples, assuming that it would make task-completion easier for them.

Methodology

Participants

All participants selected for this study were monolingual native Persian speakers with the age range of 4-6 who were attending the kindergarten. The subjects were randomly chosen for this study. They were twenty 4 year olds, twenty 5 year olds and twenty 6 year olds. After consent was given by the parents as well as the children participating in the study, all procedures were performed accordingly.

Procedures

A pilot study was conducted on some other children in the same kindergarten and its results were used in the choice of appropriate procedures. The researchers asked some personal questions to create a friendly atmosphere and devoted 15 minutes to each interview. A brief introduction which was related to the

information needed to complete the tasks, was given to each child. The children were provided with two different tasks examining comprehension and production.

In the first phase of the study, three picture-elicitation tasks were given to each child to check the agreement between subject and verb in their production. Children were presented with pairs of pictures in which the same actions were performed by singular and plural subjects (see Fig. 1).The participants were asked to sit at about 50 cm from the computer screen and watch the pictures shown on the screen while listening to the researchers' questions. After a 10 second wait, children were asked to provide the required sentences. In the second phase of the experiment which was conducted five days later, children were tested by listening to three orally presented utterances, each describing a picture with different number of subjects for each verb namely, picture-selection task. Here, the same condition was set for the children; they were instructed to sit still and listen to the sentences uttered by the researchers while looking at the computer screen simultaneously. The time interval for students' response was the same as the previous task. In both stages, the responses of the participants were video-taped and recorded. It is worth mentioning that no clues for the correct answers were given to the participants during both phases. Meanwhile, children received some toys for their participation in the study.

In both sets of tasks, three singular and three plural subjects were chosen to elicit the correct responses from the participants. Sentences such as the followings were used in the tasks:

-Una daran dars mikhonan (they are studying)

-Un dokhtar dare to park bazi mikone (that girl is playing in the park)

-Bacheha daran bastani mikhoran (children are having ice-cream

Children's responses were recorded on a sheet with their names and ages written above. The responses were scored by checking their accuracy in identifying agreement between subject and verb.

Figure 1. An example of picture stimulus presented to the participants



Findings

A multivariate analysis was done to examine comprehension and production of sub-verb agreement among kindergarten Persian-speaking children. Age was considered as the independent factor and total scores of selection and elicitation tasks as the dependent variables. A maximum score of 6 was assigned to both tasks and each correct response received a score of 1. The findings of the statistical analysis

supported the existence of an asymmetry in production and comprehension with the former superior to the latter (Wilks' L = .972, F= .4, P= .808). The data resulted from ANOVA confirmed the same conclusion (P>.5.)

Table 1: Between-Subjects Factors

		N
age	4.00	20
	5.00	20
	6.00	20

Table 2: Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.918	312.916[b]	2.000	56.000	.000	.918
	Wilks' Lambda	.082	312.916[b]	2.000	56.000	.000	.918
	Hotelling's Trace	11.176	312.916[b]	2.000	56.000	.000	.918
	Roy's Largest Root	11.176	312.916[b]	2.000	56.000	.000	.918
age	Pillai's Trace	.028	.405	4.000	114.000	.805	.014
	Wilks' Lambda	.972	.400[b]	4.000	112.000	.808	.014
	Hotelling's Trace	.029	.396	4.000	110.000	.811	.014
	Roy's Largest Root	.027	.777[c]	2.000	57.000	.465	.027

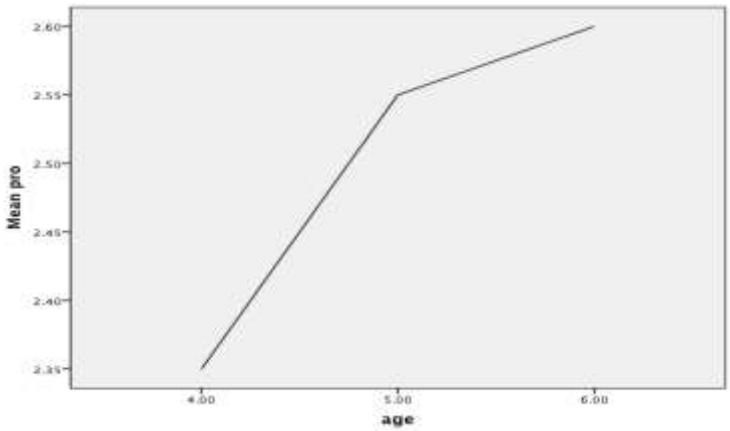
Table 3: tests of Between-Subject Effects

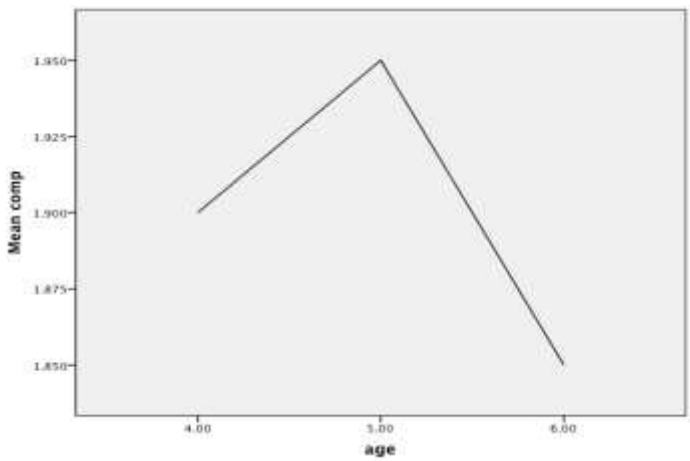
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	pro	.700[a]	2	.350	.582	.562	.020
	comp	.100[b]	2	.050	.048	.953	.002
Intercept	pro	375.000	1	375.000	623.178	.000	.916
	comp	216.600	1	216.600	208.199	.000	.785
age	pro	.700	2	.350	.582	.562	.020
	comp	.100	2	.050	.048	.953	.002

Error	pro	34.300	57	.602			
	comp	59.300	57	1.040			
Total	pro	410.000	60				
	comp	276.000	60				
Corrected Total	pro	35.000	59				
	comp	59.400	59				

The results can be observed in the following graphs as well.

Figure 2 & 3. Research Results





Discussion and Conclusion

In this study, the researchers conducted two experiments to test children's comprehension and production of subject-verb agreement. Effort was made to select tasks which match children's linguistic processing capacity. The findings revealed an asymmetry between the two which is comparable to the results of the previous studies that were discussed earlier in this paper (Pine & Gobet, 2006; Hendrik & Koster, 2010; Grinstead, 2000). Due to the rich morphological agreement system in Persian, there exists an independent marking system of number for each person. In spite of this fact, children experience difficulty in their early attempts in the comprehension of such structures. This vulnerability can be attributed to some linguistic variations including the complicated nature of morphological system in Persian which make it hard for children to capture the interpretation of subject-verb agreement. Meanwhile, it can be asserted that children can become competent in syntactic distribution of number marking without an optimum mastery of the comprehension of Persian morphological system.

The absence of morphological uniformity, which can be seen in inflections like "ha" and its allomorphs such as "an-jat" etc., contribute to the complexity of learning situation. Furthermore, a detailed analysis of data revealed that children's linguistic comprehension and production were at different stages of maturation with the 6 year olds outperforming the other two groups in the elicitation task. In fact, it takes more time for younger kids to understand the conditions in which subject can agree with its verb.

Our observation of children's non-adult-like performance in both picture selection and elicitation tasks leads to the assumption that the production of linguistic expressions precede their comprehension. In fact, it can be concluded that the asymmetry between comprehension and production can be used to assess children's grammatical development. Apparently as children age, their correct use of agreement increases gradually and they become more competent users of grammatical conventions used in language.

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