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An Amazing Conundrum in Children's Comprehension and Production of Verb Inflection

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Abstract: This paper aims at investigating the acquisition of third person singular/plural verb inflection in the comprehension and production of Persian sentences. It argues that children's comprehension lags several years behind their production. Seventy Persian children (4 to 6 years) attending kindergarten were selected to investigate their comprehension and production ability concerning third person verbal inflections. Employing an elicitation task, this study shows that almost all children regardless of their age range could correctly produce the correct inflected forms. Moreover, the results of the picture selection task proved that there was no significant difference in the performance of the children in their interpretation ability except in pro-drop plural sentences. In fact, most of the children, irrespective of their age, could successfully interpret the non-pro-drop singular and plural sentences, in addition to the pro-drop singular ones. However, regarding the pro-drop plural sentences, only the 6-year-olds could significantly recognize the difference between plural and singular inflectional markings on the verbs. The results show an asymmetric development of verb inflection in children's comprehension and production which means that the relationship between these two processes is not a straightforward matter.

Key words: Comprehension · Production · Asymmetry · Subject-verb agreement · Verb inflection

INTRODUCTION

It has long been a common wisdom that comprehension sets the stage for production. Accordingly, if children produce a particular form correctly, they must be aware of the basic grammatical rules. However, in recent years some studies have seriously challenged this claim and have proved that such a postulation does not hold true for all domains of language. For example, in several aspects of language acquisition, children's production precedes their comprehension: in pronouns, specifically in the Delay of Principle B Effect [1-4], in the acquisition of definite and indefinite NPs [5], in Spanish Perfective Aspect [6] and in word order [7, 8].

One major area where production surprisingly precedes comprehension is in verb inflections. Some studies found that Spanish-speaking children start to produce correct verb inflection by at least two years of age [9, 10]. A similar finding was reported for the English-speaking children. [11] found out that children begin producing /s/ markers between 24 and 36 months. Similarly, [12] analyzed language samples drawn from a longitudinal study carried out with 42 typically-developing children to find out the development of production of verbal-s. Children's language sample was collected at the age of 25, 29 and 35 months. The results revealed that in the earlier stages (25 and 29 months), children exhibited different performances. Most of them produced these structures when they were three years of old. It is worth noting that children's production pattern varies cross-linguistically. In the "Optional Infinitive Stage" children first produce the uninflected forms, but, as they reach two and three years old, their productive use of inflected forms gradually increases [13]. Pro-drop languages with their richer morphological system, lead to a much earlier production age starting at a year and a half [14]. Similarly, Spanish, Italian and Catalan are examples of inflectionally rich languages in which very young children seem to be capable of producing the inflected forms. Children speaking these languages showed less than 5% agreement error [15].

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Similar findings in the area of verb comprehension inflection using different methods in different languages have led to different results. [16]'s study on third person singular-s as a number agreement cue performed on African American English showed that out of 30 children between the ages of 4 and 6 years performing a picture selection task, only five showed sensitivity to this agreement marker in all tasks. She, further, found out that children's performance was at chance levels.

[17] investigated the comprehension of third person singular /s/ as a number agreement marker of children who speak Mainstream American English. They tested 62 children on their comprehension of sentences containing singular and plural verbs using pairs of similar pictures which differed in the number of agents. To avoid the children from relying on subject endings to recognize the correct picture and to ensure that they use their knowledge of number agreement, the subject ending was concealed by choosing verbs starting with an /s/ cluster. The results revealed that children's comprehension lagged much behind their production and only the 5-and 6-year olds paid attention to the third person singular /s/ as the only signal of subject number despite the fact that they seemed to have started producing verb inflections much earlier. They posited that understanding subject-verb agreement necessitates metalinguistic inference, which is too demanding for children younger than 5 years old.

[18] (p. 47) claimed that since the English agreement system lacks "semantic information," English speaking children resort to number marking on the noun instead of verb marking as a cue [p.47]. They used a picture selection task to investigate the comprehension of verb agreement as a cue to subject number in Khosa language with its rich system of agreement. To do so, they examined 38 children aged between 4 and 5 years old and found that these children didn't perform any better than English-speaking children in a similar age range. In other words, the probability of getting the singular or plural form correct for both 4 and 5 year olds is similar.

Some other researchers postulated that the nature of the task used in some research studies affects the results. [19]'s study was conducted on infants using the head-turn performance procedure to investigate their sensitivity to the verbal inflection-s. This proved that the nineteen-month-olds preferred to listen to sentences containing verbal agreement over those which mistakenly lacked this verbal inflection. This was taken as a signal of infants' early attention to the s-marker at the end of the verbs.

[20] investigated the acquisition of English number marking in nouns and discovered a later sensitivity time. It was found that the 24-month-olds' attention was attracted more to the matching screen in which, in addition to the nouns, verbal cues (there are some blickets vs. there is a blicket) were embedded. However, tasks with nouns signaling the number could attract the 36-month-olds' attention.

[21] adopted two methods of preferential looking and pointing in order to probe into children's ability to correctly comprehend verb agreement. The results contradicted previous findings regarding ability to comprehend subject-verb agreement occurring only around 5 years of age. In fact, the results of the two methods showed that very young French children (30 months old) could recognize the matching scene or picture. Their research, contrary to previous researchers' claim regarding "the increasing decisional and motor burden" of picture selection task, did not prove to be true even for the 30-month olds. In addition, there was no preference for either the singular or plural conditions.

Overall, the various justifications proposed by the different scholars for the research on comprehension and production in different domains of language fall under the following major categories: nature of experimental tasks [17], lack of pragmatic knowledge, cognitive limitations such as inability to reason and the limitation in working memory [3] and position of overt verbal agreement [21].

This phenomenon may have its root in the linguistic and morphosyntactic structure of different languages. Contrary to English, plural marking is not placed within a syntactic projection including noun phrases. "Generally, the kinds of affixes that correspond to syntactic nodes such as tense, case and number, are inflectional." Accordingly, "it is worth noting that plural marking in Persian meets some of the criterion for being a derivational rather than inflectional affix" [22] (p.56).

Plural Marking in Persian

Nominal Marking: Singular nouns do not have any markings (Cobett-not in reference list, as cited in 23) but there are a variety of inflections which are used as plural marking in Persian including those for denoting animate entities such as-ha,-an (e.g. [1]mærd 'man', mærd-an 'men') and those which can also be used for signifying inanimate nouns such as-an (eg. deræxt 'tree', deræxt-an 'trees' (Lazard-not in reference list, as cited in 22). It is worth noting that the morphemes-an and-at have many

allomorphs including-an,-gan,-yan,-van,-at,-jat and-yat that mark plurality [24]. In formal language, the words which have their origin in Arabic, adopt a variety of ways to show plurality (e.g. mosafer 'traveller', mosafer-in, 'travellers'; heyvan 'animal', heyvan-at 'animals'; tæræf 'side', ætraf 'sides'; ?axs 'person' æ?xas 'people') (Lazard-not in reference list as cited in 22). The variety of factors that can influence the choice of marking make the choice of plural marking complex.

Verb Inflection: Both plural and singular verbs are marked.

Mikhoræm, mikhori, mikhore, mikhorim, mikhorin, mikhoræn

I eat, you eat, she/he eats, we eat, you eat, they eat

No overt article signifies definiteness. Excluding the case of generic nouns, bare nouns in subject position are always interpreted as definite. Plural definite nouns always take plural verbs (22).

- bæt∫eha ræftæn
  the children went. PAST-3SG
  'The children went'

For the objects, the case marker-ra makes a distinction between definite bare nouns and the non-referential nouns (22):

- ketab khundæm
  book read.PAST-1SG
  'I read books'

- ketab-o khundæm
  book-OM read.Past-1SG
  'I read the book'

In other words, bare plurals in both subject and object positions are interpreted as definite (22).

- bæt∫eha gerye= kærdænd
  child-PL cry=do.PAST.3PL
  'The children cried.'

On the whole, plural marking occurs with bare nouns if the noun is definite [22].

The definiteness impact of plural marking is further proved by the predicate nominals which are mainly singular despite having a plural subject [22]:

- Anha daneshju ænd
  They studentSG-be.3PL
  'they are students'

Similarly, plural marking occurs with noun phrases incorporating numerals if they are definite, otherwise a singular noun will be used:

- Se-ta ketab khæridæm
  Three-CL book buy.PAST-1SG
  'I bought three books.'

- se ta ketab(ha) ro khæridæm
  Three-CL book (-PL)-OM by.PAST-1SG
  'I bought the three books.'

The only exception to this is the indefinite marker ye (k), which corresponds to the indefinite clitic-I, generally used with both plural and singular marking [22]. Plural marking can also be used with the indefinite enclitics in both subject and object positions:

- bæt∫e-ha-ye bahushi unja bazi mikærdæn
  child-PL-EZ clever there play=CONT-do.PAST-3PL.
  'The clever children were playing there.'

- Ketab-ha-ye jaleb-i khundæm
  Book-PL-EZ interesting-IND read.PAST-1SG
  'I read (some) interesting books.'

The present research aims at exploring children's number comprehension in Persian which is a morphologically rich language. The research also intends to provide some justifications for the way they behave. The main incentive for the inclusion of both pro-drop and non-pro-drop sentences was to explore the claim that children resort to number marking on the nominals.

The research questions under investigation are:

- Do children successfully interpret single and plural pro-drop sentences?
- Do children successfully interpret single and plural non pro-drop sentences?

Methodology: Participants: A total of 70 kindergarten children with the age range of 4 to 6 years were randomly chosen for this study. They were from similar socio-economic backgrounds. There were 20 four-year-olds, 25 five-year-olds and 25 six-year-olds. Three four-year-olds were also tested. However, they were excluded from

ASCCI phonetic alphabet

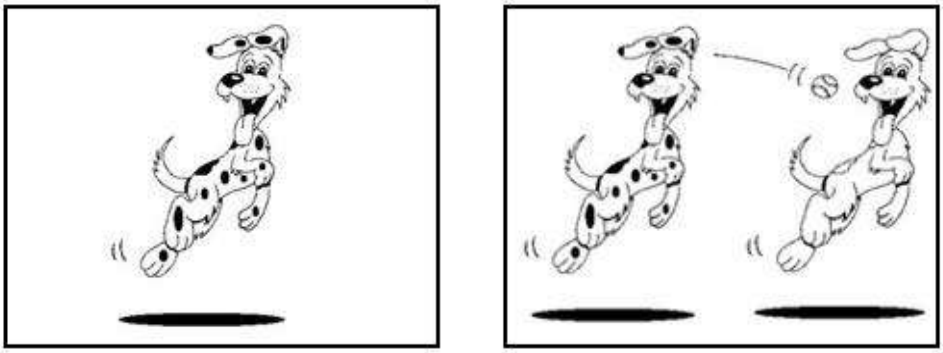

Fig. 1: Examples of visual material presented to the children:

the study because they did not answer all the questions. All children were monolingual speakers of Persian and did not suffer from any language disorders as reported by their teachers.

Procedures: Based on the results of the pilot test done on some other children, the choice of stimuli and procedures were decided. The test was carried out in a quiet room with a researcher. The researcher sat to their immediate right. Each interview lasted for about 10 minutes. With the aim of establishing a friendly relationship with the children, they were first asked some personal questions such as name, last name and age. Then they were provided with some information regarding the tasks. The children took part in two different tasks: production and comprehension. In the first phase of the experiment on production, each child was presented with 8 pictures which elicited verb inflections. One week later, the same children were asked to listen to an orally presented utterance describing a picture and point to the relevant picture. For each sentence, a pair of similar simple colored drawings was presented which differed only in terms of the number of the agents depicted. It is worth noting that 2 different sets of pictures were employed in the production and comprehension tasks.

'Sag toop bazi mikone' (the dog plays with a ball)/ 'sag ha toop bazi mikonan' (the dogs play with a ball)

The testing procedure started with 3 warm-up trials. The children received encouragement and feedback without taking into account the accuracy of their answers. The responses were recorded on a piece of paper by an undergraduate student. Then, each child was presented with sentences containing the subject (5 singular and 5 plural condition), in addition to sentences devoid of any subject (4 singular and 4 plural). It is important to point out that the warm-up sentences were not scored and were just included to familiarize children with the test.

The following are some examples of the sentences in the test:

- Non Pro-Drop:
  dokhtær be ayne negah mikone
  The girl at the mirror looks PRESENT-3SG
  'The girl looks at the mirror.'

- una be gola ab midæn
  They the flowers water. PRESENT-3PL
  'They water the flowers.'

- Pro-drop:
- hendoone mikhore
  Water melon eats. PRESENT-3SG
  'He eats watermelon'

- ghaza mipæzæn
  Cook food. PRESENT-3PL
  'They cook food'

All subjects in this experiment were animate. The order of presentation of the different subject-verb agreement items was randomly chosen by the researcher and the side of the matching picture was counterbalanced within participants for each visual stimulus.

RESULTS

The main purpose of this study was to explore Persian-speaking children's comprehension and production of third person inflection. A multivariate analysis was performed with the age as the independent factor and total scores of plural, singular, pro-drop plural and pro-drop singular as the dependent factors. In the production test, each child was assigned a maximum score of 8 for both singular and plural sentences.

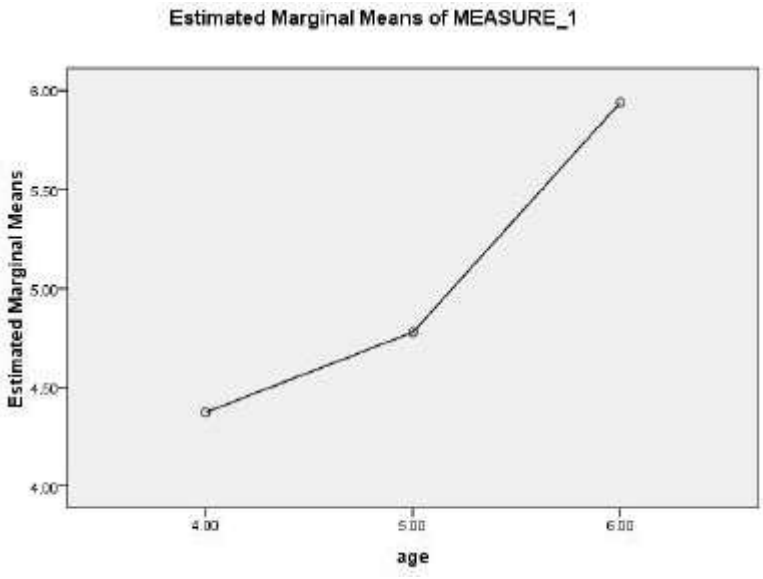

Fig. 2: Children's comprehension of pro-drop plural sentences

On the whole, less than 5% agreement error was found in both plural and singular sentences produced by children. In comprehension, each child's responses were recorded by the researchers together with an undergraduate student. Each correct response was awarded a score of 1 if the child was successful at matching the correct picture based on the oral stimulus. On the whole, each child received a total score of 0 to 5 for each group of non-pro-drop plural and singular sentences and 0 to 4 for each group of pro-drop plural and singular sentences respectively. Zero score was allocated in cases of facing unscorable responses in which the child either pointed to both pictures or did not clearly point to the specific one. Out of the 70 children, four performed perfectly (one 4-year old child and 3 6-year olds). The result of the multivariate analysis revealed a significant multivariate main effect for age (Wilks' L =.630, F(8, 128)= 4.15, p=.000, partial eta squared= 0.20).

Given the significance of the overall test, the univariate main effects were examined. The results showed that significant main effects belonged to pro-plural (F (2, 67)= 10.52, p=.000, η =. 24) indicating a difference in the level of children's comprehension of verb inflection for plural sentences lacked any overt subject. However, the F tests for sentences with subject (plural: $F(2,67)=0.73, P=0.48, \eta=.22$),(singular $F(2,67)=0.77, P=0.46, \eta=.23$) and the pro-singular sentences were not significant ($F(2,67)=1.62$, $P=0.204$, $\eta=.04$).

Significant age pair wise differences were then obtained in the comprehension of pro-plural verbs between the 4-and 6-year olds and between the 5-and 6-year olds indicating that the 6-year olds outperformed the two age groups in pro-plural sentences. The results revealed that children could successfully interpret non-pro-drop singular and plural sentences together with pro-drop singular. As for the pro-drop plural sentences, only the 6-year-olds successfully recognized these sentences (Figure 2).

DISCUSSION AND CONCLUSION

The findings of this study suggest an asymmetry between the comprehension and production of verb inflection in Persian. This is in line with the Spanish data provided by [25] and the English data offered by [26]. Similar to Spanish, which has a rich morphological agreement system [25], Persian, with its robust agreement system, doesn't seem to prevent the late comprehension development in comparison to production.

It is possible that structural differences among different languages contribute to difficulty in parameterization in number in different languages at diverse age range. In fact, in Persian there is a rich and complex verbal agreement in which there is an independent marking of number for each person. Initially, this might seem to lead to children's earlier correct interpretation. However, the results of the present study on Persian with its rich agreement system together with the Spanish data provided by [25] cast doubt on this claim. In Persian this can be attributed to some various linguistic factors. First, the complex morphological inflections in Persian including-ha, the allomorphs

like-an,-gan,-yan,-van,-at,-jat and-yat, together with the Arabic origin inflections (-in,-at, a-) all have created a quite complex situation for the child to deal with and they, therefore, contribute to the difficulty in the interpretation of verb inflections. In reality children produce the inflection (-a) as an umbrella term to cover all these inflections which is quite acceptable in informal language.

What makes it more demanding for the child is the fact that certain conditions must be met in order for the Persian nouns to undergo pluralisation: "Plural marking is not possible on bare nouns in Persian nor on nouns appearing with numerals unless, in both cases, the resulting noun phrase is definite" [22], (p.66). Yet, the indefinite nouns can only be pluralised if they are attached to enclitics.

Besides, the bare count nouns in object position allow coerced reading in Persian. To be more specific, singular nouns are sometimes construed as plural nouns [22]. The opposite might also hold true in certain situations where a universal sorter reading can occur in which count noun is interpreted as a mass noun. In conclusion, the findings of the study account for the asymmetry in children's comprehension and production of verb inflection.

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