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Evidence of Developmental Patterns in the Acquisition of a Language:

A study of prepositions and particles' early acquisition

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Abstract

This study explores the early developmental patterns during the acquisition of language and specifically the acquisition of prepositions and particles for a one year-old monolingual Arabic-speaking child over a period of 2 years. The study's hypothesis states that there exists a pattern where children tend to use while acquiring prepositions and particles in Arabic, and specifically there is precedence in the order that particles and prepositions are acquired. A sub-hypothesis of this study states that children tend to acquire spatial prepositions before temporal prepositions. The data compiled for the subject during this study consisted of a transcript of conversational dialogue between an adult and the subject, as well a summary of some actions performed by the child. Evidences indicated that at an early-stage, there was a lack of prepositions and particles. Then at the later stage, there were some evidences of the use of words that act as particles and prepositions. Lastly at the final stage, the child started to use words that act as prepositions. In addition, results showed one use of temporal preposition, which explained that spatial prepositions were easily acquired than temporal prepositions.

Over the latest years, language has been a major concern in linguistics and cognitive science. The ability of infants to acquire a language since birth, their ability to produce babbles, small phrases, and incomplete sentences as they grow, and then filling the missing parts shows an evidence about how our brain acquire and produce language. Furthermore, it is also important to study the linguistics point of view of such development, which could educate the parents about the different stages of such development and therefore the parents would be capable of teaching each grammatical feature at its specific acquisition stage.

After few weeks of experience with language, infants begin to vocalize and they generally begin to coo at about one month of age (Shaffer, 1999). At around 3 or 4 months, infants start to produce consonant sounds to their cooing, and they begin to babble at between 4 and 6 months of age. First, they practice their vowels more precisely, starting with the round, back vowels (oo, oh, ah...) and working their way to the un-rounded front vowels (ee, eh, ay...) (Boeree 2003). The first consonants are h, m, and b, which can be combined with the vowels to make syllables. By reaching 10 months, on average, most infants understand between 5 and 10 words (Boeree 2003).

The one-word stage consists from the period of 1 year to 1 year and 6 months, which consists of producing one-word sentences. These produced first words are also called by "holophrases" because children's productive vocabulary usually contains only one or two very simple words at a time, and they seem to utter single words to represent the whole meaning of an entire sentence (Shaffer, 1999). By 1 year, most children's vocabulary size consists of 3 or 4 words, and could understand from 30 to 40. By

reaching 1 year and 6 months, most kids can produce 25 to 50 words on their own, and understand hundreds (Boeree 2003).

In the initial stage of the production of one-word, children produce words slowly. However, once they achieve a productive vocabulary of ten words or more, children begin to add new words at a faster rate, called "vocabulary spurt" (Barrett, 1985). From 1 year and 6 months to 2 years, children start to develop what is called "the two-words sentences". Some common examples, showing a variety of grammatical functions taken over by simple conjunction of the two words (Boeree 2003):

> want milk
> that doggy,
> momy shoe (i.e. momy's shoe)
> allgone juice (numbers and quantities)
> want more (making a request)
> put book (verb-object "sentences," i.e. you put the book over here)

After the age of 2 years, children begin to use grammatical constructions of various types. Some usual order of such development can be shown with the following examples (Boeree 2003):

> in basket, on floor (prepositions)
> three balls (the plural) , dad's ball (possessive *'s*)
> There it is (the verb *to be*)
> A ball, the ball (articles)
> It is going (the progressive formation of verbs)

As children construct their mental dictionary from their exposure to the environment, they start collecting meaningful words (content-words) such *as water, daddy, more* and so on. Then as they start having a clear image of objects, people and places around them, they start utilizing functional words such as *the, on, or under.* As Berk explained that those children's first sentences contain mainly the essential content

words, such as verbs and nouns, but omit the function words, such as articles, prepositions, and pronouns, auxiliary verbs (Berk, 2000). It is also important to view how children add the function words to the content words phrases.

In summary, children tend to use the most needed vocabulary at a younger age such as milk, water, more, and daddy, for instance. As they grow older their vocabulary span extends to include other needed vocabulary. On the other hand, as illustrated above, children tend to produce less-complex grammatical sentences to more-complex ones by age. Therefore, it is important to study the stages where children acquire a certain grammatical feature in order to understand any linguistics pattern available during such acquisition. Such understanding will then enable parents to emphasize more on the corresponding grammatical feature corresponding to a particular stage of acquisition in order to prevent errors.

Therefore, the current study was made to explore the development of prepositions and particles' acquisition for a 1-year-old Arabic speaker child over a period of two years. For this study, the hypothesis is that there exists a pattern where children tend to use while acquiring prepositions and particles in Arabic. Specifically, children tend to produce holophrases, as they are exposed to their living environment, then as they learn new words they add them to their holophrases taking in consideration the word-order of sentences in Arabic (either SVO or VSO).

On the other hand Tomasello observed and studied prepositions' acquisition for his daughter from age 1 to 2 years old and concluded that spatial prepositions are acquired before non-spatial ones (Tomasello 1987). It could be the case that the spatial

prepositions are acquired and used before temporal prepositions due to the fact that the spatial prepositions are easy to recognize and thus understood, whereas the temporal ones deal with time which is a complex concept to children at a younger age. Therefore, a sub-hypothesis that is proposed for this study states that children tend to acquire spatial prepositions (i.e on, on, above, under…) before temporal prepositions (until, about…). To target both hypotheses, conversational transcripts along with a summary of actions performed while playing a game with prepositions, were collected over the period of 2 years (from 1 year-old to 3 years) and then evaluated.

Since the data collected for this study were in Palestinian Arabic, which is a dialect of formal Arabic that is spoken by people originally from Palestine. Formal Arabic was a dialect spoken by the tribe of Quraish in Saudi Arabia before the revelation of the Quran (the Muslims holy book), which then was labeled as Formal Arabic due to the fact that it is the language of the holy Quran. On the other hand, Palestinian Arabic is similar to formal arabic, with the exception to some features. These features are found sometimes in the vocabulary of a language for example the use of the word *handbag* is *haqibat-yad* in Formal Arabic and *shanta* in Palestinian Arabic, and other times while using grammatical features. In this case Palestinian Arabic uses and emphasizes more on a subset of the grammatical features of formal Arabic. In such a way, it focuses more on a subset of the Formal Arabic's particles and prepositions, adverbs, and word order (the SVO form is more often used then the VSO form). Throughout this study, we will point out the important grammatical structures found in formal Arabic then we will point out the differences, if any, in Palestinian-Arabic.

In formal Arabic for instance, the word order of a sentence could be either (SVO) as in (2) or (VSO) as in (3). In some cases, when the verb takes a conjugation of the auxiliary "to be", it would be omitted and thus easily understood from the meaning of the sentence such as in (1), whereas in Palestinian Arabic the (VSO) form of a sentence is rarely used. Prepositional phrases in both formal and Palestinian Arabic could substitute the subject of the sentence, the object of the sentence, or it could be an adjunct of either one. In addition, as in English, prepositions in both formal or Palestinian Arabic, require an argument such as a noun to form a prepositical phrase, whereas particles do not require any arguments. Let us observe the following examples:

(1)

Al-tayr fouqa al-tawila

The bird above the table

The bird is above the table   (prepostion)

قــوف بهاذ اـن (2)

Ana dhahib fouq

I going above

I am going up   (particle)

(3)

yarssoum al-waladou kouratan

is drawing the boy a ball

The boy is drawing a ball

The preposition *above* takes the noun-phrase *the table* as its argument to form a prepositional phrase in (1). Whereas in (2) the particle *up* does not require any argument

and the meaning is thus understood from the sentence that *I am going up the stairs.* Notice that the Arabic word for both *up* and *above* is the same. In Arabic*,* the equivalent word for both *above* and *up* is considered to be a preposition when it requires an argument and a particle when it does not. In addition, all prepositions with the dual-functionality ones, share a common linguistic feature, which is changing the ending of its argument by suffixing *-i*. Bellow is a list of the most commonly used prepositions and particles in Palestinian-Arabic:

- min   *from*
- ila   *to*
- Aan   *away-from*
- Ala   on, above, over
- Jamb   *next-to*
- Maa   *with*
- Fee   *in, inside*
- Be   *tightly with, by*

  - Fouq   *above*
  - Tahet   *under*
  - Waraa   *behind*
  - Ouddam   *in-front*
  - jouwa   *inside*

Figure1: all words above are prepositions but words in the small box are particles as well.

Method

Subjects

The subject was a 1 year-old boy whose native language is Palestinian Arabic. The child was born and currently resides in the United States. He was raised by his grand mother who does not speak anything but Palestinian-Arabic due to the fact that his parents are working parents. The parents could only interact with him during late afternoons and weekends. The entire family of this child uses Palestinian-Arabic to communicate to him and only allows him to watch Arabic speaking TV channels or listen to Arabic songs. These conditions helped with choosing the subject in order to reduce any

foreign language interference such as English or Spanish, which could affect somehow the results of this study.

Data collection

Over a period of 2 years, from the age of 1 to the age of 3, transcripts of the child utterances whether in conversations or while playing games were collected from video tapes, audio tapes or with direct contact with the child. The conversational transcripts, in Arabic, were classified into 3 groups with respect to the period, which certain utterances were collected. In each group, there were 60 utterances of the child. The first group's utterances occurred from age 1 year to 1 year and 6 months. Then, the second group's included utterances occurred between age 1 year, 9 months and 2 years, 3 months. Lastly, the third group's utterances included the utterances that occurred from age 2 years, 6 months to 3 years. In overall, there was a 3 months gap between each group in order to avoid, to a certain extent, having repetitive utterances.

In addition actions performed when the child was asked to change the location of a toy, were summarized. There were three cases as for recording these actions. In case 1: the child was 1 year-old, case 2: the child was 2 years old, and case 3: the child was 3 years old. For each case, the subject was asked to place a toy in, on, above, inside, under, next to, in front of, in the back of a box. Furthermore, the child's resulting actions were summarized for each case and will be later discussed.

Procedure

The subject was often encouraged to produce utterances by asking him to locate a certain object or person, talk about a specific toy, describe what another person is doing, or sometimes while playing games such as hide-and-seek, playing games such as building

blocks, constructing train rails, or even putting specific shapes in its corresponding location. All these actions, while preformed, utterances that were produced by the child were recorded by videotapes and audiotapes, and then transcribed in Palestinian Arabic into three transcription sets. In addition, there were few times where some utterances were transcribed on site. The subject's utterances were highlighted in pink (to illustrate the subject's utterances in the first set), in yellow (to illustrate the subject's utterances in the second set), and in purple (to illustrate utterances the subject's utterances in the third set). In the case of a missing particle or preposition, the missing word was quoted in the sentence when the child was uttering the sentence while performing an action or a gesture. Such quoting was important to study any misuse of either the prepositions or particles and thus study any available errors. In addition, tables were made by the right of each utterance in all the sets for results' scoring purpose.

Results

Scoring

For the three sets of transcripts, next to each utterance, a mark was written in the table in order to illustrate whether the preposition or particle was missing, correctly used, or incorrectly used, using the following symbols: "∅", "✓", "✕" respectively. Then these marks were counted and grouped into resulting tables. Other specifications such as observing temporal prepositions vs. spatial prepositions and dual functionality prepositions vs. mono-functionality ones were taken in consideration summarized in the resulting tables and discussed later in this paper.

Analysis

The case of observing the data from the transcripts, showed a lack of prepositions at the first stage (i.e from 1 year to 1 year, 6 months). At this stage, there were 20 utterances out of 60 that were missing prepositions in them. At the second stage (i.e from 1 year, 9 months to 2 years, 3 months), there were 30 utterances that used either prepositions or particles correctly and 23 utterances that lacked them. Finally, at the third stage (i.e from 2 year, 6 months to 3 years), there were 30 utterances that used correctly both the prepositions and particles, and 9 utterances that lacked either ones. Throughout the 3 stages there were no errors made using either prepositions or particles. They were either used correctly or were lacked in the sentences. A detailed results table is demonstrated bellow:

	Available		**Missing**	
Stage 1	**Particles**	**Prepositions**	**Particles**	**Prepositions**
1 year to 18 months	None	None	None	20 (2 *fouq*, 5 *be*, 3 *jamb*, 7 *ala*, 3 *maa*)
Stage 2 21 months to 27 months	8	22	None	23 (2 *be*, 6 *maa*, 1 *fouq*, 4 *ala*, 1 *tahet*, 2 *waraa*, 5 *fee*, 1 *jamb*)
Stage 3 30 to 36 months	6	24 (1 temporal-prep)	None	9(4 *fee*, 3 *maa*, 2 *ala*)

Table1: illustrates the results extracted from the 3 sets of transcripts. In the "Missing" column and at the prepositions sub-column, the list of Arabic missed prepositions were shown.

For the second part of data collected for this study, there was a set of actions recorded of the child while asking him to perform actions on a toy *fee (in), ala (on), fouq (above), jouwa (inside), tahet (under), jamb (beside or next to), ouddam (in front), waraa (on the back of)* a box. The results of each case is as follow:

Case 1: at 1 year old

When the child was asked to perform an action with the toy when asked to put it in, on, or under a box, the child tends to put the toy inside the box. However when the child was asked to put the toy above or inside, he would perform them accordingly and correctly. For the case of next to, the child would put it to the right of box, noting that the child is right-handed. For the case of in front of, or in the back of, the child was confused and always puts it in the back of he box, which is relatively in front of him.

Case 2: at 2 years old

When the child was asked to perform an action with the toy when asked to put it in, on, or under the box, the child tends to put the toy correctly in and on the box, however for the case of under, he would put the toy next to the box. However when the child was asked to put the toy above, inside, or next to, he would perform them accordingly and correctly (as case 1, he would still put the toy to the right of the box). For the case of in front of, or in the back of, the child successfully could perform them accordingly, however he would put the toy in front of the box that is relatively in front of him in the sense that the box will end up between the toy and him. Then in the case of "in the back of" he would put the toy behind himself so that he would be between the toy and the box.

Case 3: at 1 year old

When the child was asked to perform an action with the toy when asked to put it in, on, above, inside, next to or under the box, the child tends to put the toy correctly for all them (as case 1 & 2, he would still put the toy to the right of the box). For the case of in front of, or in the back of, the child successfully could perform them accordingly, however he would put the toy in front of the box that is relatively in front of him in the sense that the box will end up between the toy and him. Then in the case of "in the back of" he would put the toy in front of himself so that it would be between the box and him.

All three cases are summarized in the following table:

	Prepositions							
Case 1	*fee*	*ala*	*fouq*	*jouwa*	*taht*	*jamb*	*ouddam*	*waraa*
1 year old	Inside	Inside	above	inside	inside	Next (right)	at-the back	at-the back
Case 2 2 years old	Inside	on	above	inside	under	Next (right)	Treats them as opposites	
Case 3 3 years old	Inside	on	above	inside	under	Next (right)	Treats them as opposites	

Table2: demonstrates the summary of the 3 cases' actions

Discussion

From Table1, we can note that throughout the three stages all of the prepositions either available or missing in utterances were spatial preposition except for one.

Therefore, this proves that our sub-hypothesis is valid and therefore, according to our study, the subject tended to produce sentences either lacking spatial prepositions, which in this case could be explained by the fact that the child is thinking about prepositions that are related to the space surrounding him, or including spatial preposition whish is an evidence that the child does indeed understand their meaning and how to use them in a sentence.

From the results shown by table1 and the summary from the interactive game, we can notice, first regarding particles, that the child never missed a particle in a sentence. This could show that as the child was acquiring particles, he was employing them in a sentence, which eventually shows that particles were easier to grasp than prepositions because as soon as he recognizes and distinguishes the functionality difference between them it might seem easier to him to use particles especially due to the fact that they do not require any argument.

As the child was getting older, we note the number of utterances missing a preposition decreased from 20 at stage 1 to 9 along with the result that the number of utterances containing a preposition increased from 0 to 24. This could explain that, as the child's use of preposition is getting better by age. The fact that in table1 the number of utterances containing particles decreased from stage2 to stage3 could be explained by the fact the child is employing more prepositions than particle. Let us note again that in Arabic, the set of particles is a subset within the set of prepositions. Therefore if we look at the types of preposition that were missed at stage 3 for example, we notice that they are belonging to the preposition with non-dual functionality. This could explain that, since to the child it was easier to acquire particles, then it was easier for him to understand their

meanings and remember them and thus he would employ them more often then employing the ones that always acquire argument. For example, in Arabic the prepositions *fouq* and *ala* both could mean *above*, however *fouq* could be a preposition as well as particle. So if a child remembers the word *fouq* when it is a particle, he must know its meaning, and thus he would not need to employ the preposition *ala* and would just use *fouq* instead. In Arabic, however, there is a small difference in the functionality of both preposition *fouq* and *ala,* which is that *ala,* takes a definite noun as an argument whereas *fouq* does not most of the time. However it is easy for a native speaker to distinguish when to or not to use each with experience. From Table2, as well, we could note that from the age of 1 till 3, the child used the preposition *fouq* meaning above correctly, whereas he made a mistake using *ala* at the age of one, which later on he corrected it.

As conclusion, there are some patterns illustrating that in Arabic, according to this study, there is a precedence in the acquisition of dual-functioning preposition than prepositions that cannot act as particles. There is also precedence in the acquisition of spatial preposition than temporal ones. However, there should be further studies and researches in this subject. There should be a larger data to explore from. May be having recorded and transcribed 60 utterances during 3 stages over 2 years is not a sufficient number to conclude such conclusion. Results could have been different if we had a large data collection over 4 years.

There also should be further studies on more than one subject either to prove or disprove such hypotheses. A study by Littlefield on data of two girl subjects showed that,

adverbs are acquired first due to its less complexity content then particles are acquired just before lexical prepositions (Littlefield 2003).

On the other hand, one needs to explore data from a girl subject and compare and contrast the result to have a clearer vision on how children acquire either particles and prepositions or temporal vs. spatial prepositions. Studies regarding brain size showed that the male brain is larger than the female brain. Experimentally, a major study in the field of magnetic resonance imaging (MRI) was conducted by Gur et al. (1999). Gur et al's study revealed that the male brain contains more white matter and cerebrospinal fluid (CSF) than the female brain, and that the female brain contains a relatively greater proportion of gray matter. Gur concluded that increases in white matter might enable men to transfer information to further regions within the brain, therefore contributing to their spatial mental contribution, while the increased gray matter in women's brains may contribute to the efficiency and the greater capacity for processing. This evidence suggests a physiological gender difference in language processing abilities. The findings of Gur et al (1999), Kimura (1992), and Shaywits et al (1995) concluded that due to some physical differences in the human brain, females ten to efficiently process information while having higher verbal abilities including a better performance at verbal tasks, whereas, males tend to have higher visual-spatial abilities. Therefore, it is crucial to explore data of a female child as well and see the patterns involved in such acquisition.

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