Does Turkish child-directed speech predict the acquisition order of wh-questions?

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1. Introduction

Studies done on mothers' input to their children have accumulated findings indicating probable effects of child-directed speech on children's language acquisition recently. The input frequency account that this study is based on is about wh-question words.

1. 1. Background

The very early studies about children's acquisition of questions have provided a cognition-based rationale. They claim that "why" and "when" are acquired later than "what" and "where" because of their cognitive constraints. According to Ervin-Tripp (1970) and Tyack & Ingram (1977), "why" and "when" are related to more abstract schemes when compared to "what" and "where". That's why; children acquire "what" and "where" earlier than "why" and "when". However; in the follow-up studies, it is found that as well as cognitive complexity account, there are other explanations, which have been regarded within the scope of linguistic complexity. To this account, the reason why "what" and "where" are acquired earlier is based on the syntactic view. Bloom et al. (1982) investigated the sequence of question acquisition in first language development. Firstly, they categorized wh-words into three groups as wh-pronominals (what and where), wh-sententials (when, how and why) and wh-adjectivals (which and whose). They said that wh-pronominals are the first question words to acquire as they mostly encode identity questions in children's early language growth. Then, children use wh-sententials. Different from easiness of referring function of wh-pronominals, wh-sententials require answers with a reason, manner or time, so they are secondly learned in the order of question acquisition. Lastly, wh-adjectivals are acquired as they entail more specific responses (Bloom et al. 1982). In addition to this categorization of wh-words in acquisition, based on a study with seven children from 1;10 to 3;00, Bloom et al. (1982) propose a syntactic complexity sequence in explaining the trajectory of wh-word acquisition. According to this account, "what", "where" and "who" are firstly acquired through the copula. Secondly, they are used with semantically general verbs (pro-verbs). Following that, wh-sententials –when, how and why- are used with descriptive verbs. Lastly, wh-adjectivals are learned by children. In short; Bloom et al. (1982) presented an acquisition order combining linguistic and cognitive accounts in question acquisition.

The developmental order offered by Bloom et al. (1982) has been challenged by the findings of the studies based on the frequency account in caregiver speech. Clancy (1989) in Korean and Forner (1979) in German and Serbo-Croatian found that syntactically simple wh-words and early acquired pro-verbs were also the patterns which were the most frequent in child-directed and adult speech (in Rowland et al. 2003). In addition to this, recent studies showing a frequency correlation between children's language productions and caregiver speech regarding different parts of speech such as nouns, verbs and morphology (Türkay, 2005; Naigles & Hoff-Ginsberg, 1998) may have led to a probable relation between mothers' and children's speech in terms of wh-words. Rowland et al. (2003) found out that frequency of wh-words in caregiver speech is a more significant predictor than complexity in revealing the children's acquisition order of questions.

When broadening the issue of wh-question acquisition, another significant point has been considered in recent studies: the type of the verb used with wh-words. According to Rowland et al. (2003), wh-complexity was also determined through the verb used with that

wh-word. They claimed that the verbs frequently used with wh-words are mainly semantically general verbs in caregiver speech, so children firstly acquire wh-words with these verbs.

In summary, main studies given above investigate the order of acquisition of wh-words, taking into account the syntactic complexity and verb semantic generality in line with input frequency effects. In the light of these discussions, the present study had two overall objectives: to investigate the frequency of wh-words in the speech of mothers whose children were grouped as in the early and late periods and to show the developmental uses of these wh-words across time and secondly; to see what kind of syntactic structures wh-words are mostly used with and what verbs they are mainly used with in the mothers' speech.

1.2. Operational Definitions

A revision on the related studies about question acquisition also highlighted some disagreements on key terms of this study: complexity and semantically general verbs. Complexity account, in its broader definition, can be used in various senses such as mothers' utterance length and child's conceptual level etc. (Rowland et al. 2003). However, in this study, the term "complexity" was only used at the syntactic level of wh-question formation. Next, another vague term in directly relevant studies is about the definition of semantically general verbs. Theakston et al. (2004) also shed light on this issue and in their study, they speculated on Ninio's (1999) and Pinker's lists of semantically general verbs and followed the lists offered by them (in Rowland et al. 2003). However, it is clear that there is no consensus in the field about which verbs can be regarded as semantically general. We also considered Theakston et al. (2004)'s, Ninio's and Pinker's lists of these verbs but in order not to ignore the language-specific characteristics of Turkish, we revised related resources about which verbs to regard as a semantically general verb. In addition to Aksan (1998), we took into account Uçar's lists of Turkish semantically general verbs (Uçar, 2009) and we checked the frequency entry of these verbs from the TDK dictionary as well. Finally, it was decided to take into account the verbs which were categorized as light bu Uçar (2009). These light verbs are at- 'throw', al- 'take', çek- 'pull', et- 'do', ol- 'happen', ver- 'give', yap- 'do/make'.

1.3. Wh-question formation in Turkish

Wh-question formation in Turkish is quite simple when compared to English. In English, it is required to invert the subject and the auxiliary verb in addition to the use of wh-question words in English. However; in Turkish, the mostly preferred position for a wh-word is just before the predicate as seen in the example below (1). Wh-phrases are also used in a position that their answers occupy in the response (example 2). In addition, a wh-phrase can be used in a subject complement as a predicate (example 3) and wh-question phrases can be combined with all inflectional suffixes which are attached to nouns.

Example
(1)

Semra'lar artık nere-de otur-uyor?
        where-LOC live-IMPF
"Where do Semra and her family live now?"

Example
(2)

Kim onları okuldan kaçarken görmüş?
Who they-ACC school-ABL run away-AOR-CV see-EV/PF?

"Who saw then running away from school?"

Example
(3)

Soruları dağıtacak olan kim-di?
Question-PL-ACC distribute-FUT be-PART person who-P. COP?
"Who was the person that was supposed to distribute the questions?"

<div align="right">(Göksel and Kerslake, 2005)</div>

1.4. Studies on wh-question acquisition in Turkish

Studies done on the acquisition of wh-question words in Turkish are quite limited. Ekmekçi (1979), Ekmekçi (1990) and Sofu (1998) have investigated the wh-acquisition in longitudinal studies. In Ekmekçi (1990), a child's language development was observed from 15-month-old to 27-month old and it was found that *what* "ne" was used at the beginning of I. MLU period and *where* "nerede", *who* "kim" and *how many* "kaç tane" were used at the end of I. MLU period. At II. MLU period, *how much* "ne kadar", *to whom* "kime, *for whom* "kimin için" were produced and why "niçin" and which "hangisi" were used IV. MLU period. Turkish children's ways of answering what, where, from where, who, whose, how and why questions in Ekmekçi (1990). Next, Sofu (1998) focused on functions of wh-words used by the Turkish children and she found out that Turkish children used wh-phrases very early with many functions such as clarification, requesting and confirmation. Recently, Türkay et al. (2010) have analysed 9 Turkish children's acquisition of wh-words longitudinally and have mentioned that Turkish children acquire wh-words earlier than English children but in the same order that Bloom (1982) found out. However, no studies have been conducted about probable effects and trajectory of Turkish child-directed speech on the acquisition of wh-words.

1.5. Research Questions

This study was framed according to the research questions given below:
a) What is the trajectory in Turkish mothers' speech directed to their children in terms of the distribution of wh-questions; namely, wh-pronominals, wh-sententials and wh-adjectivals?
b) What is the syntactic trajectory of wh-questions in Turkish mothers' speech directed to their children?

2. Methodology

2.1. Data

Data of this study were based on a longitudinal database by Türkay (2005). Parallel to the aim of the research, only mothers' speech to their children was taken into analysis. The participants were four girls aged 1;04-2;03 and their mothers. The children were video-recorded in their routine interactions with their mothers. Each video-recorded session was nearly 45 minutes. The data transferred into written transcripts, following CHILDES, Clan conventions. 48 sessions from the database were considered for this study. These sessions were categorized into four time periods as: 1;04-1;06, 1;07-1;09, 1;10-2;00, 2;01-2;03.

2.2. Coding and Analysis

The mothers' speech was analysed in terms of wh-questions. All spontaneous wh-questions directed to the children were extracted from the mothers' speech across all transcripts. Wh-questions in frozen utterances such as songs or rhymes were not taken into

consideration. The analysis was conducted on tokens since we wished to know the frequency count of the number of times a child is exposed to wh-word question structures. As Turkish is a case-inflected language, all case inflected forms of wh-words were counted as tokens.

The first level of analysis was conducted to show the overall trajectory of each group of wh-questions; namely, wh-pronominals, wh-sententials and wh-adjectivals, throughout the longitudinal data. Following the criteria in Bloom et al. (1982) and Rowland et al. (2003), wh-words -*what* "ne", *who* "kim", *where* "nerede, hani"- were included in the wh-pronominals. Wh-sententials included -*when* "ne zaman", *how* "nasıl" and *why* "neden, niçin" and finally, wh-words in the adjectival group were *which* "hangi", *whose* "kimin", *what colour* "ne renk", *how many* "kaç tane", *how much* "ne kadar" etc. Not ignoring language-specific aspects of Turkish, wh-words were categorized accordingly. For that purpose, we followed Göksel & Kerslake's definitions of wh-phrases (2005).

The second level of analysis was conducted for syntactic purpose, borrowing the exact coding scheme by Rowland et al. (2003) and regarding the language-unique characteristics of Turkish. Each wh-question uttered by the mothers was given a code for whether the wh-word was used as a predicate (1), was used with a semantically general verb (2), was used with a descriptive verb (3), was used in an elliptic position (4), was used with an existential verb *there is/are* "var/yok"(5) and was used with an adjective or a noun (6).

3. Findings

The findings of this study were presented in two main parts. Firstly; the distribution of wh-words in the mothers' speech as a lexical item was given across early and late periods. In this analysis, wh-questions were considered as a lexical item (Figure 1). No syntactic or semantic criteria were taken into consideration. Secondly; the overall trajectory of three wh-word groups were shown in relation to their syntactic complexity. Each wh-question-group was analysed individually in Figures 2, 3 and 4.

Figure 1. Overall trajectory of wh-words across time in the mothers' speech
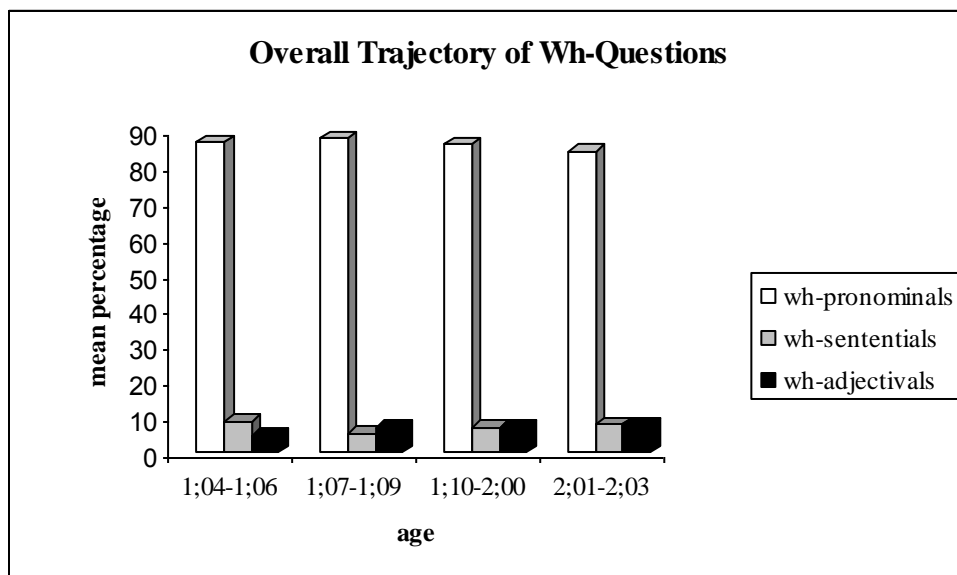

Figure 1 shows the overall trajectory of wh-question phrases in the Turkish mothers' speech through longitudinal data. It is clear that wh-pronominals are the dominant category over wh-sententials and wh-adjectivals across time. Starting from the first period (1;04-1;06), a very slight and continuous decrease is seen in wh-pronominals. On the other hand, the trajectory that wh-sententials go through is somewhat different from that of wh-pronominals. Wh-sententials exhibit a decrease from the first period into two but then, in the following periods,

they increase gradually. Lastly; wh-adjectivals show a consistent rise throughout the periods (from 4,6 % to 7,9 %). At that point, it is important to recall the findings of a study by Türkay et al. (2010) about Turkish children's acquisition of wh-phrases in the early period. They conducted their study on the same database that this actual research was based on. In their study, they observed that the Turkish children acquire wh-pronominals earlier than wh-sentials and wh-ajectivals. Therefore, we can conclude that there is a parallelism between Turkish mothers and their children in terms of the trajectory that wh-phrases followed.

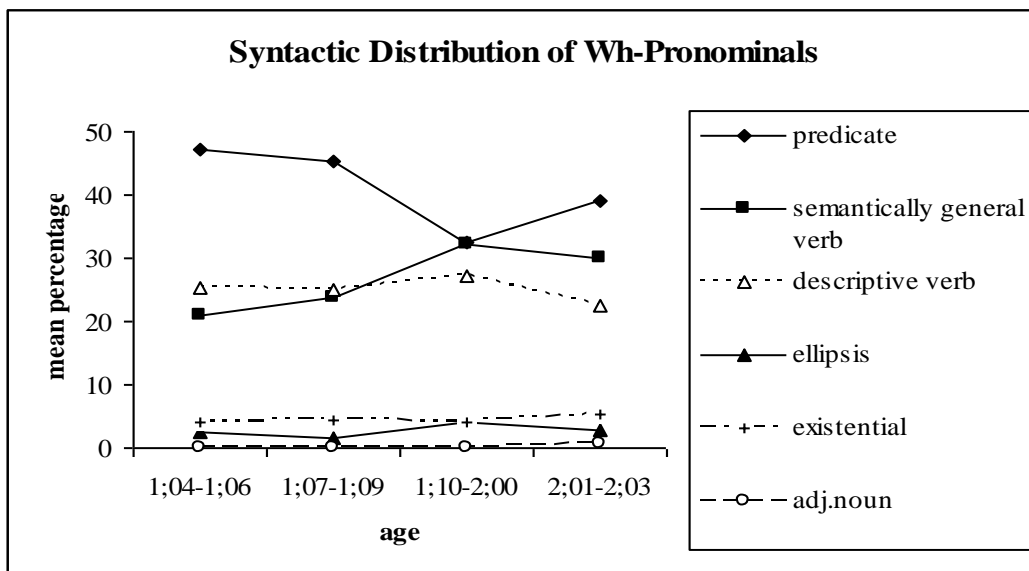Figure 2. Syntactic trajectory of wh-pronominals

Syntactic Distribution of Wh-Pronominals

Figure 2 illustrates the distribution of wh-pronominals in terms of their syntactic positions in the mothers' speech. As clear in Figure 2, the Turkish mothers use wh-pronominals mostly in predicative function in their talk to their children aged 1;04-1;09. However, after the age of 1;07-1;09, a sudden decrease is seen on the predicative use of wh-pronominals; whereas, a regular rise is seen on the use of semantically general verbs with wh-pronominals, except a slight decrease between the period of 1;10-2;00 and 2;01-2;03. In the last period, again a dominance of wh-pronominals in the predicative function is observed. In addition, Figure 2 exhibits that the Turkish mothers use wh-pronominals with descriptive verbs nearly at the same proportion with semantically general verbs (25 %) in their talk to their children aged 1;04-1;06. However, the use of semantically general verbs with descriptive verbs does not show any drastic ups and downs. It is always between 20 % and 25 % throughout the study. The use of wh-pronominals with existential verbs and with an adjective or a noun and in elliptical position does not point out significant changes across time in the study.
Some examples are given below to exemplify the different uses in the exact transcriptions. In example 4, the mother uses wh-phrase *where* 'nerede' in the predicative function.
Example
(4) (Child 3's mother (age: 01;04))

*MOT:	Bunlara bakalım mı?
	'Let's look at these?'
%sit:	MOT has a photo frame on which there are different animals.
*MOT:	Burda ahtapot nerde?
	'Where is the octopus here?'
*MOT:	Bu?
	'This?'

In example 5, the mother whose child was 1;05 years old uses *what* 'ne' with a descriptive verb *play* "oynamak".

Example
(5) (Child 1's mother (age 1;05))

*MOT:	Ne oynasak biz senle ne oynasak?
	'What will I play with you?'
%act :	CHI takes a toy among her toys and shows it to her mum.
*MOT	Ne o?
	'What's this?'

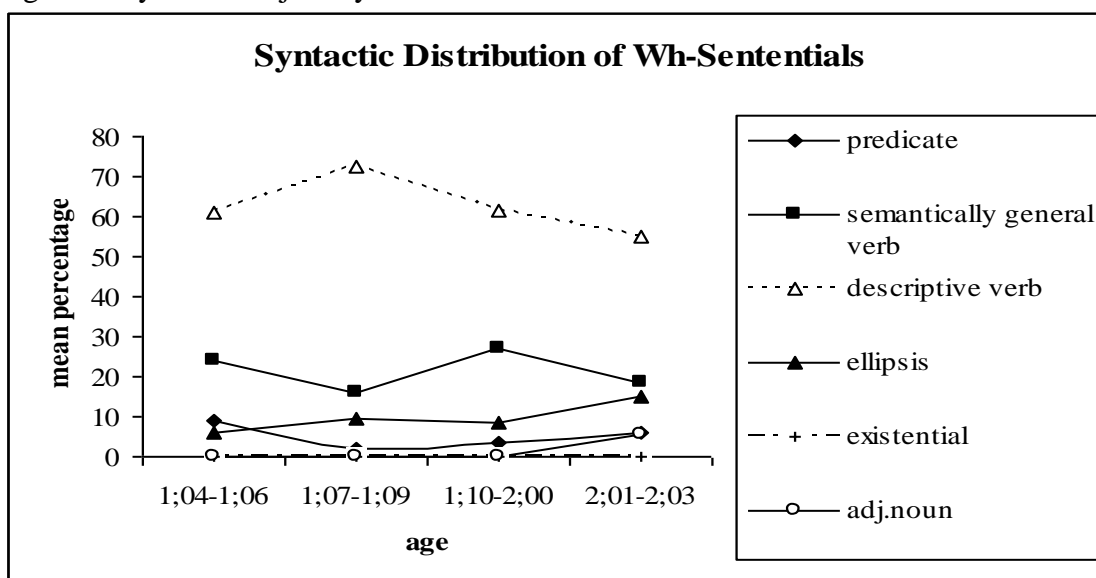Figure 3. Syntactic trajectory of wh-sententials

Figure 3 reveals the syntactic trajectory that wh-sententials follow across age periods. A superiority of descriptive verb use with wh-sententials is clearly seen though there is a decreasing tendency after 1;07-1;10 age period. Secondly, wh-sententials are used with semantically general verbs. Predicative use of wh-sententials is always very low. At the highest point, they occupy only 10 % of overall use. The use of existential verbs and adjective/noun with wh-sententials and the elliptical use of wh-sententials are very limited. Example 6 exemplifies the use of wh-sententials with a descriptive verb.

Example
(6) (Child 2's mother (age: 01:06))

*MOT:	Sen ne zaman uyandın aşkım?
	'When did you wake up, my dear ?'
*MOT:	Duymadık biz sohbet ediyorduk.
	(We did not hear, we were chatting.)

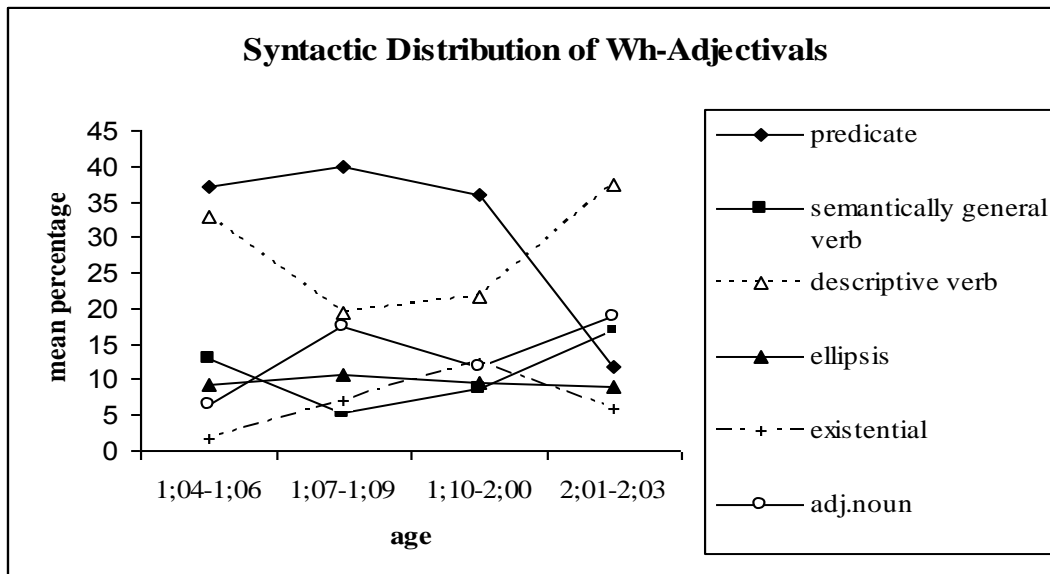Figure 4. Syntactic trajectory of wh-adjectivals

Figure 4 shows the distribution of syntactic categories in wh-adjectivals. The percentage of wh-adjectivals use with descriptive verbs and the percentage of wh-adjectivals use in the predicative function are quite close to each other (33 % vs. 37 % respectively) at the age period of 1;04-1;06. However, after that time period, a drastic decrease is observed in the use of descriptive verbs. This decreasing tendency changes into an increasing trajectory after the age period of 1;07-1;09. Especially, the rise from the age period of 1;10-2;00 to 2;01-2;03 is remarkable. Similarly but in the reverse order, a sudden decrease is seen in the wh-adjectivals use in the predicative function. Unlike wh-sententials and wh-pronominals, the use of wh-adjectivals with an adjective or a noun shows an increase. Example 7 illustrates Child 3's mother in the study while she is using a wh-adjectival with an adjective. As seen in Example 7, wh-adjectivals; namely hangi "which", kimin 'whose', kaç tane 'how many' etc. require describing something more definitely. Therefore, the increase in the wh-adjectivals use with an adjective or a noun is an expected trajectory

Example
(7) (Child 3's mother (age: 1;11))

*MOT: hangisi farklı?
           'Which one is different?'
*MOT: bundan hangisi aynı?
           Which one is same?'
*MOT :   iki tane.
           Two of them.
*MOT :   Bak bununla bu kalem aynı.
           'Look, this one and the pencil are same.'
*CHI :   Koyalım.
           'Let's put it.'

Example 8 shows the use of wh-adjectivals with existential verbs. The use of existential verbs is also very rare in the use of wh-pronominals and wh-sententials. But it, at some age periods, reaches at 10 % with wh-adjectivals.
Example
(8) (Child 2's mother (age: 1;11))

*MOT:	Kaç liran var?
	'How much money have you got?'
*MOT:	İki liran var.
	'You have two liras.'
*MOT :	Peki iki liranla ne alacaksın?
	'Well, what will you buy with two liras?'
*CHI :	Para.
	'Money.'

3.1. Discussion

The overall aim of this research was to observe the trend that Turkish mothers go through when using wh-words in their talk to their children aged 1;04-2;03. The main result highlighted in this study is Turkish mothers' general trajectory in the use of wh-questions. According to Bloom et al. (1982) and Rowland et al. (2003), children firstly learn wh-words (wh-pronominals) with the copula, then they acquire these wh-words with semantically general verbs and then wh-adjectivals. The role of child-directed speech on this pattern that English children follow in their early language development has been studied in limited number of studies (Rowland et al. 2003). They concluded that wh-frequency in caregiver speech may not be regarded as the most significant factor on children's wh-question growth but it was found to be a more powerful predictor of children's wh-question acquisition. While talking to their very young children (aged 01;04-02;03), Turkish mothers use wh-pronominals significantly more than wh-sententials and adjectivals. This overall frame is completely identical to Turkish children's wh-question acquisition. Mainly conducting their research on the same data that this study was based on, Türkay et al. (2010) observed the same global developmental composition in Turkish children's early wh-question word productions. We can say that there is an asynchrony between Turkish mothers' and children' use of wh-phrases.

The secondary pattern we explored was the syntactic trajectory that wh-phrases were used with. Regarding this aspect, we tried to see in what syntactic positions wh-words occurred and to compare/contrast this point between mothers' and children's language productions. At that point, referring to the findings from Türkay et al. (2010), we should revisit the Turkish children's wh-acquisition in terms of the syntactic patterns. Türkay et al. (2010) found that Turkish children use wh-question words mainly in the predicative function, then, with semantically general verbs, and then with descriptive verbs. Turkish mothers; on the other hand, prefer using wh-pronominals in the predicative function more than other uses. The dominance of predicative use of wh-adjectivals over other uses can especially be seen at the age period of 1;04-2;00.

4. Conclusion

The role of mothers' input on children's early language development was ignored in the past but in recent years, there is a growing interest on the possible links between children's language productions and caregiver speech in many languages. Sofu & Türkay (2006) investigated the input frequency effects of child-directed speeh in terms of noun/verb dominance and Türkay & Kern (2008) analysed these effects from a crosslinguistic perspective with a comparative study between French and Turkish. Researchers did different analyses between children's language use and mothers'talk such as frequency, the length of maternal utterances and contextual effects. The primary purpose of the study was only to identify the general trends in Turkish mothers' child-directed speech regarding wh-question word-use and to detect any similarities and differences between children's language growth

and mothers' talk to their children. We may conclude that –though not statistically- Turkish child-directed speech, to some extent, predicts the acquisition order of wh-questions in Turkish children's early language development.

Note: The presentation of this paper in the ICTL conference in Hungary, Szeged was funded by TÜBİTAK, (2224) (The Scientific and Technological Research Council of Turkey) to the first author.

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