This paper was published by Harrassowitz Verlag in `Studies on Turkish Linguistics` Eds. Goksel,A and Kerslake, 2000

Head Parameter Setting in the Acquisition of Turkish as a First Language

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The primary task an infant faces in acquiring his/her mother tongue is to construct a grammar of the language. As Chomsky (1981) states, the infant's language acquisition device (LAD) incorporates a theory of Universal Grammar (UG) comprising

- a set of universal *principles* of grammatical structure which are invariant across languages, and
- a set of structural *parameters* which impose strict constraints on the range of structural variation permitted in natural languages.

Thus structural language acquisition is mainly restricted to what is called *parameter-setting*, because the child does not have to acquire the universal principles which are part of his/her genetic endowment.

The assumption that the child's construction of the structural aspect of his/her language is the relatively easy task of setting a handful of syntactic parameters provides a natural way of accounting for the fact that the acquisition of specific parameters appears to be remarkably rapid and error-free. For instance, Radford (1990) observes that, in the acquisition of English as a first language, children even as young as 18 months old appear to set the head parameter at its appropriate *head-first* setting from the very earliest multiword utterances they produce. The consistency of the relative position of a head and its complement at phrase level have been studied by Greenberg (1963). Greenberg, as cited also in Chomsky (1972) and Jackendoff (1977), in his discussion of language universals, claims that the position of a head and its complement within a phrase at a given level of projection is found to be consistent across various categories within a language. Chomsky (1981), while discussing the same topic, suggests that the relative position of heads and complements for all phrases needs to be specified once in a given language. Rather than a long list of individual rules specifying the position of the head in each phrase type, a single generalization (a or b) suffices.

a) Heads are *last* in the phrase.
b) Heads are *first* in the phrase.

Chomsky (in Pinker 1984) suggests that different types of lexical heads namely nouns, verbs, prepositions and adjectives be grouped under a single entry called X. When these lexical heads are combined with their complements (Y or Z), they are grouped under XP. "Just plug in noun, verb, adjective, or preposition for X, Y, Z, and you have the actual phrase structure rules that spell the phrases. This streamlined version of phrase structure is called the X-bar theory" (Pinker 1994, 119), which can be generalized to any human language. Within this endocentric syntactic framework, properties of the whole phrase are determined by the properties of the single lexical head, X.

In the same line of reasoning, Atkinson (1992) proposes that the principles of X-bar theory, along with thematic properties of lexical items, determine the type of possible D-structures in a grammar once the relevant parameter governing directionality is fixed. From this, we might expect X-bar principles to constrain the child's grammatical system from a very early age. For instance, Radford's (1990) observation reveals that children seem to know that English is a head-first language. The data he collected from a boy at the age of 20 months demonstrate the child's consistent use of verbs and prepositions before their complements (see examples in 1a and 1b).

(1)a. *Touch* heads. *Cuddle* book. *Want* crayons. *Want* malteser. *Open* door. *Want* biscuit. *Bang* bottom. *See* cats. *Sit* down.

(1)b. *On* mummy. *To* lady. *Without* shoe. *With* potty. *In* keyhole. *In* school. *On* carpet. *On* box. *With* crayons. *To* mummy.

The *principles and parameters* model of acquisition (Chomsky, 1970) provides an answer to the question of why children acquire the position of heads and complements in such a rapid and error-free fashion. The model states that acquiring this aspect of word order involves a comparatively simple task of setting the binary parameter provided by UG at its appropriate value on the basis of minimal linguistic experience. When the child begins to parse a sentence produced by adults, like *ask mummy*, and realizes that it contains a verb phrase including the head verb *ask* and its complement *mummy*, he/she will automatically know that all heads in English are normally positioned before their complements.

On the basis of the assumption that the head characteristic of a natural language plays a crucial role in the syntactic development of that language in its acquisition process (Cook, 1994; Haegeman, 1995; Radford, 1990, 1997), this study attempts to investigate the head-parameter setting in the acquisition of Turkish as a first language, using the data in the longitudinal study by Ekmekci (1979). The reason for this choice is that the data from this longitudinal study fit the aim of the present investigation since they comprise bi-weekly recorded utterances of a girl called Didem between the ages of 1;3 and 2;4, a period corresponding to the starting point of multiword utterances.

In Turkish the lexical items that function as head nouns, verbs, postpositions (PoP), and adjectives follow their complements, in contrast to English, in which heads precede their complements. The differences between these two types can be exemplified by comparing the Turkish statements (2a and 2b) with their English counterparts (3a and 3b):

(2)a. [$_{S}$[$_{NP}$ Balkondaki kız] Ali'yi seviyor.]
HEAD N

Balcony-LOC.-RED.REL. girl Ali-ACC love-PROG.

(2)b. [$_{S}$[$_{PP}$ Ev-den] geliyorum.]
HEAD PoP

home-ABL come-PROG.-1.sg.

(3)a. [$_{S}$[$_{NP}$ The girl on the balcony] loves Ali.]
HEAD N

(3)b. [$_S$ I am coming[$_{PP}$ <u>from</u> home.]]
HEAD PrP

In the Turkish NP *balkondaki kız* (2a), the head N *kız* follows its complement *balkondaki*. Likewise, in the Turkish PP *evden* (2b), the postposition *-den* follows its complement N *ev*. By contrast, we find precisely the opposite order in English. In the NP *the girl on the balcony* (3a), the head N *girl* precedes its complement PP *on the balcony*; likewise, in the PP *from home* in (3b), the preposition *from* precedes its complement N *home*.

Accordingly, a child first focuses on the most essential means (e.g. inflection in Turkish and word order in English) of conveying the message, since he/she is under certain constraints in producing utterances (Ekmekci, 1979, 1982).

Analyzing the data

Determining the exact nature of the child's earliest syntactic system is an extraordinarily difficult task. However, data on L1 acquisition (e.g. Radford 1990) suggest that the basic distinction in the head parameter is quickly incorporated into the child's grammatical system. We based our analysis on Radford's (1990) approach, and thus

- ″used the same phrasal categories namely NP, VP, AP, P(o)P, and
- ″analyzed our data starting with two-word utterances.

No exception to Radford's findings, we also found evidence from Turkish L1 data displaying conformity to the syntactic patterns of Turkish in terms of parametric value being head-last. Our data analysis indicates that Didem has already set the directionality parameter of the inflectional suffixes for postpositional phrases, and some tense markers for verb phrases, by the time of her two-word stage. We believe that such early setting of this parameter is due to the heavily inflectional structure of Turkish. Examples relevant to these findings will be presented later while discussing our findings regarding Didem's single-word stage. At the two-word stage (from 18 months onwards), Didem begins to produce all the phrases within the X-bar syntax correctly confirming the assumption that setting the head parameter is one which entails minimal linguistic evidence. This means that she has already acquired the basic projection schema for Turkish at a very early age. Moving from the assumption that UG endows the child with an innate knowledge of the principles for projection, and leaves her/him only the setting of head parameter directionality to acquire, we can hypothesize that once there is evidence of the use of the lexical categories N, V, P, and A, there should also be evidence in the child's utterances illustrating the projection of these lexical categories into the corresponding phrasal categories NP, VP, P(o)P, and AP (Radford 1990).

When we analyze the data, we see that Didem, at a very early age, seems to know how to project N into N' by determining the direction of the head N correctly. Some samples from the data are presented below:

	Age (Months)
(4)a. [sokak / ev *ayakkabım*]	19;5
(outdoor / indoor shoe-1.sg.)	
(4)b. [ayak *tarağı*]*	19;5
(foot comb-CmpM.)	
(4)c. [tualet *sabunu*]	20
(toilet soap- CmpM.)	
(4)d. [mai *sabun*]	20
(blue soap)	
(4)e. [ınga *bebek*]*	20
(cry baby)	
(4)f. [ça *badaı*]	23
(tea glass- CmpM.)	
(4)g. [burun *damlası*]	23
(nose drops- CmpM.)	
(4)h. [çocuk *abi*]*	23
(child elder brother)	
(4)i. [deniz *mayom*]	25
(sea swimming suit-1.sg.]	
(4)j. [Özden teyze]	25
(Özden aunt)	
(4)k. [ağlayan *bebek*]	27
(cry-SbjP. baby]	

At the two word-stage, Didem's NP constituents appear as follows:

$$\begin{bmatrix} \text{noun} \\ \text{adj.} \\ \text{proper noun} \\ \text{(red.) rel. clause} \end{bmatrix} + \text{N}$$

The examples (4b, 4e, and 4h) which do not occur in adult speech, reveal that the child is also capable of constructing the phrases with the head N in its proper position even in her own creative versions of NP. However, in (4)b, we see the overgeneralization of modification because here the phrase *ayak tarağı* refers to a comb in the shape of a foot. In (4)e and (4)h, although the structure used does not exist in adult language, the modifiers (*inga* and *çocuk*) are relics of the reduced relative clause. These words act as complements: *inga* in (4)e modifies the baby who is crying and *çocuk* in (4)h modifies the child who is old compared to Didem but still young when compared to other children. In both cases, NPs are in head-final poisiton preceeded by the self innovated modifiers.

Parallel to the findings regarding the NP, we witness that Didem, again at a very early age, seems to have acquired the knowledge of how to project V into V' by adding a preceding, complement as presented below:

	Age (Months)
(5)a. [yodan *çekilin*]	19
(street-Abl. get away-2.pl.)	
(5)b. [kitat *adı*]	19;5
(book take-Past)	
(5)c. [yede *yatıyoyum*]	19;5
(floor-Loc sleep-Prog..-1.sg.)	
(5)d. [Ameritata *gitti*]	19;5
(The US-Dat. go-Past)	
(5)e. [elimizi *yıkıyoz*]	20
(hand-1.pl.-Acc. wash-Prog.-1.pl.)	
(5)f. [kitabımı *getir*]	20
(book-1.sg.-Acc. bring-2.sg)	
(5)g. [*bıktım* denden]*	20
(be fed up-Past-1.sg. you-Abl.)	
(5)h. [yüzünü *kapatmı3*]	23
(face-3.sg.-Acc. cover-Rep.Past)	
(5)i. [çiçek *topluyoduk*]	25
(flower pick-Prog.-Past-1.pl.)	
(5)j. [gürültü *yapacam*]	25
(noise make-Fut.-1.sg)	
(5)k. [onu *dö0mü3ler*]	27
(s/he-Acc. beat-Rep.Past-3.pl.)	

The fact that the complement is consistently positioned before the head verb provides obvious corroboration of our previous suggestion that the complement + *head* value of the head parameter is correctly set at an early age. Example (5)g might seem like an exception to our claim, but this is an indication of the child's acquisition of the possible shift in complement-head order for pragmatic purposes as early as the two-word stage. In this example, Didem uses the head verb in the initial position to emphasize her anger against her mother. This type of shift is widely used by adults to emphasize and reinforce their intentions or feelings. This statement is, therefore, the most appropriate form from the pragmatic point of view to convey the intended message. We therefore claim that, in Didem's utterances, no form which violates the head parameter setting that applies Turkish has been observed

As for PoP, in Turkish a postpositional phrase contains a postposition as its last element. As Kornfilt (1997) states, **most postpositions are dependent morphemes** that assign case to their nominal complement. There are also 'secondary postpositions', which are actually nouns but used as postpositions, such as *içinde* and *üzerinde*. Didem clearly knows, at an age as early as 18 months, that P can be projected into P' by the addition of an inflection into the complement, as presented in the following examples (where the P' constituents are square bracketed and the head is separately italicized):

	Age (Months)
(6)a. [kotuk-*tan*] kayacam (armchair-Abl.) slide-Fut.1.sg.	19
(6)b. [Kateti-*te*] ditti (Kayseri-Dat.) go-Past	19
(6)c. [ye-*de*] yatıyoyum (floor-Loc) sleep-Prog.-1.sg.	19;5
(6)d. [elin-*den*] yedi (hand-3.sg.-Abl.) eat-Past	23
(6)e. [araba-*la*] dittik (car-with) go-Past-1.pl.	23
(6)f. [restoran-*a*] gidecem (restaurant-Dat.) go-Fut.1sg.	25
(6)g. [kürek-*le*] döğmüşler (shovel-with) beat-Rep.Past-3.pl.	27

The general pattern of Didem's utterances of PoP at the two-word stage can be displayed as

$$N + \begin{bmatrix} \text{ablative} \\ \text{dative} \\ \text{locative} \end{bmatrix} \text{ and } N + \text{-IE}$$

It is certainly significant that we find the same head-last order in P' structures as in V' and N' structures. This, once again, suggests a cross-categorical symmetry in the child's acquisition of the head parameter setting.

Given that Didem has developed N', V', and P' relatively well at this stage, we might expect to find evidence that she has developed an equally complex A'. However, there is no evidence that she knows how to project A into A' by adding a preceding complement, as illustrated in the following phrases: *afraid of dogs*, *glad about your decision*, *pleased with the results* (Aarts, 1997). When we apply this to Turkish, we see the same concept being expressed by that VP comprises the verb *korkmak* (*to be frightened*). The adjectives *korkunç* (*frightful*), *korkulu* (*frightened*), *korkutucu* (*frightening*) are all derivatives of the root verb *kork* (*to frighten*). The other instances of adjectives utilized by Didem are observed to be in the NP modifying N, as illustrated in the above NPs. However, we have rather more substantial evidence that Didem has begun to master the A' adjuncts at her two-word stage because, as early as 17 months of age, she starts producing utterances using *çok* as an adjunct to adjectival constituents such as *güzel* (beautiful), *sıcak* (hot), *acı* (spicy), and *ayıp* (shameful) as illustrated in the examples in Examples 4. In fact, when these utterances are analyzed taking the context into consideration, they can easily be interpreted as Aps, because these phrases act as complements rather than modifying the NPs in subject position. As illustrated in the following dialogue, the AP in Didem's utterance is given to express her reason for refusing to eat the soup.

Adult: Çorbanı iç.
Soup-2.sg.-Acc. eat
Didem: çok acı (AP)
very hot (spicy)

She is capable of shifting the order of the adjective in order to transpose the positions of A and N when trying to indicate the quality of the water she requests:

Adult: Ne istiyorsun?
what want-Prog. 2.sg.
Didem: So0uk su. (NP)
Cold water

	Age (Months)
7a. [çok *güzel*] (very beautiful)	18
7b. [çok *sıcak*] (very hot)	19
7c. [çok *acı*] (very hot /spicy)	23
7d. [çok *ayıp*] (very shameful)	27

As we looked into the acquisition of head parameters in Turkish within the framework of X-bar theory among the two-word utterances of Didem, we observed the application of the proper head parameter setting even within single words, as a result of the inflectional character of the Turkish syntactic system. This led us to analysis of Didem's single-word utterances as well. Consequently, we discovered the existence of proper head parameter setting from an age of 16 months, which is the starting point of our data collection. We therefore suggest that the analysis of data for all languages be made as soon as children utter two morphemes, whether bound or unbound (Ekmekci, 1979; 1982, p. 105). An adaptation of this type would enable us to form a link between the prepositions in head-first languages and the morphological case markers in head-last languages.

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