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What experimental data tells us about the acquisition of complementation in Turkish

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This paper analyzes the acquisition of complement structures in Turkish, concentrating on the acquisition of object complements formed with the nominalizers *-mAK*, *-mA*, *-DIK* and *-(y)AcAK*. Experimental tasks were carried out with 42 children between the ages 3;0 and 6;5. There were different experiments assessing children's production, comprehension and imitation of complementation. The order of acquisition among the nominalizing suffixes was investigated. The role of matrix verbs in the choice of the nominalizing suffix is discussed.

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1.1. Introduction

The aim of this paper is to investigate the acquisition of complementation in Turkish.* While the properties of complementation in Turkish have been studied within many different frameworks, indicating that complementation is both syntactically and semantically a complex structure, its acquisition has not yet been examined in detail. This article will try to show how this complexity is reflected in acquisition, with the main emphasis on the acquisition of nominalized complement clauses. Acquisition of complementation is interesting since it is the first form of complex sentences in children's speech (Bloom et al. 1989).

The article is organized as follows: Section 1 provides the structural properties of complementation and a bibliographical survey of previous works. In section 2 the method and the scoring of experiments are provided. Section 3 presents the results of the data. Section 4 includes the concluding remarks.

1.2. Definition

Complementation is a major syntactic process in languages. Several definitions of complementation are available. A basic definition of complementation that will be adopted in this study is given by Bloom et al. (1989: 101-102) which states that

* This article is part of my master's thesis at Boğaziçi University, written under the guidance of Prof. Dr. Ayhan Aksu-Koç and Prof. Dr. Eser Taylan.

"complementation is the special instance of complex sentences in which one proposition serves as the argument within another proposition".

1.3. Structural description

In Turkish there are two major types of complementation, the first type being sentential complements and the second type nominalized complements. In sentential complementation, the complement verb is inflected for tense, aspect and person agreement just like the matrix predicate. On the other hand, nominalized complement clauses are marked with a nominalizing suffix, followed by the appropriate nominal inflection morpheme(s).

Sentential complements can be divided into two: (i) those formed without a free complementizer, (ii) those that are constructed with *ki* and *diye*.[1] In the first group, there are a limited number of verbs that select sentential complements: *zannet-* 'assume', *san-* 'think', *bil-* 'know' and *tahmin et-* 'guess'. As can be seen from example (1), the complement clause is in the form of a simple sentence with the verb inflected for tense, aspect and person.

(1) *[Git-ti-n]* *san-dı-m / zannet-ti-m.*
go-PAST-2S think-PAST-1S
'I thought you have left.'

The syntactic form of Turkish nominalized complement clauses is exactly the same as simple genitive noun phrases. As seen in examples (2a) and (2b), the possessor or the subject is marked with the genitive and the possessed is marked with nominal agreement in both structures.

(2) a. *[Ayşe'nin* *ses-i-]ni* *duydum.*
Ayşe-GEN voice-POSS3S-ACC hear-PAST-1S
'I heard Ayşe's voice.'

b. *[Ayşe'nin* *gel-diğ-i-]ni* *duy-du-m.*
Ayşe-GEN come-DIK-POSS3S-ACC hear-PAST-1S
'I heard that Ayşe came.'

Nominalized complements may function as the subject, object, matrix predicate or the complement of a noun head. In this study only the object complement clauses that

[1] It should be noted that there are significant syntactic and semantic differences between *ki* and *diye*.

are formed with the nominalizing suffixes *-mA*, *-mAK*, *-DIK* and *-(y)AcAK*[2] will be investigated.[3]

In object complement clauses in Turkish, the embedded verb is inflected with one of the nominalizing suffixes *-DIK*, *-(y)AcAK*, *-mAK* or *-mA*, the choice of which is dependent on the verb (Taylan 1998a; Schaaik 1999). The factors that affect the choice of the nominalizing morpheme will be considered in detail in the next section. In the *-DIK*, *-(y)AcAK* and *-mA* clauses, the nominalizing suffix is followed by the possessive morpheme. This possessive agreement suffix has to agree with the subject of the embedded clause, which is marked with the genitive morpheme *-(n)In*. The subject of the complement clause is usually omitted since it can be recovered from the form of the possessive agreement suffix on the complement verb. The embedded verb is then marked with the case suffix assigned by the matrix predicate, as can be seen from the following examples:

(3) *Ben [(siz-in) dün geç kal-dığ-ınız-]ı duy-du-m.*
I you(pl)-GEN yesterday late stay-DIK-POSS2P-ACC hear-PAST-1S
'I heard that you were late yesterday.'

(4) *Anne-m [(biz-im) geç kal-acağ-ımız-]a üz-ül-dü.*
mother-POSS1S we-GEN late stay-ACAK-POSS1P-DAT be sorry-PASS-PAST
'My mother was sorry that we will be late'.

(5) *Ahmet [(o-nun) geç kal-ma-ma-sı-]nı iste-di.*
Ahmet s/he-GEN late stay-NEG-MA-POSS3S-ACC want-PAST
'Ahmet wanted him/her not to be late.'

In complement clauses with a non-verbal embedded predicate (i.e. a noun or an adjective) the verb *ol-* 'be' is used for the nominalizer and other suffixes to be attached onto.

(6) *(Ben) [sınav-ın zor ol-duğ-u-]nu düşün-üyor-um.*
I exam-GEN hard be-DIK-POSS3S-ACC think-PRES-1S
'I think the exam is/was hard.'

As can be seen from the examples, the syntactic structure of the object complement clauses formed with *-DIK*, *-(y)AcAK* and *-mA* is rather complex. However, *-mAK* complementation is simpler in form since it does not have the possessive agreement morpheme. This is the main difference between *-DIK*, *-(y)AcAK*, *-mA* and *-mAK*

[2] The capital letters stand for the underlying form of the suffix. The vowels and consonants change according to the rules of vowel harmony and agree with the root.

[3] Complement clauses in Turkish may also be formed with the nominalizer *-(y)Iş*. But *-(y)Iş* complementation is excluded in the experiments, since it was not encountered in the naturalistic data.

clauses. Most *-mAK* clauses are control constructions, i.e. the subject of the complement verb is co-referential with the subject of the matrix verb.

(7) *(Ben) [uyu-mak] istiyorum.*[4]
(I) sleep-INF want-PRES-1S
'I want to sleep.'

-mA clauses are marked with agreement, whereas *-mAK* clauses are only inflected for case, as required by the matrix verb, since they are control constructions. On the other hand, in *-mA* clauses the subject of the embedded verb and the matrix verb are not co-referential[5]. The following examples show the structural and semantic differences between *-mA* and *-mAK* very clearly:

(8) *Ahmet [Ayşe'ye bağır-mağ-]ı unut-ma-dı.*
Ahmet Ayşe-DAT shout-MAK-ACC forget-NEG-PAST
'Ahmet did not forget to shout at Ayşe.'

(9) *Ahmet [Mehmet'in Ayşe'ye bağır-ma-sı-]nı unut-ma-dı.*
Ahmet Mehmet-GEN Ayşe-DAT shout-MA-POSS3S-ACC forget-NEG-PAST
'Ahmet did not forget Mehmet's shouting at Ayşe.'

(10) *Ahmet [Ayşe'ye bağır-ma-sı-]nı unut-ma-dı.*
Ahmet Ayşe-DAT shout-MA-POSS3S-ACC forget-NEG-PAST
'Ahmet did not forget his own/his shouting at Ayşe.'

In sentence (9) Ahmet did not forget how Mehmet shouted at Ayşe, that is the details of the event are not forgotten. In sentences (8) and (10) the subject of the main clause is co-referential with the subject of the embedded clause. However, in (8) *-mAK* is used since it has an action reading, i.e. Ahmet did not forget to shout at Ayşe. In (10) a different meaning is achieved due to the use of *-mA* instead of *-mAK*. The sentence

[4] Since the subject of the main clause and the embedded clause are identical, there is assumed to be an underlying PRO as the subject of the embedded clause (Chomsky 1981). So the structure is:

(7) *(Ben) [PRO uyu-mak] isti-yor-um.*
I sleep-MAK want-PROG-1S
'I want to sleep.'

[5] There are a limited number of matrix verbs, such as *bil-* 'know', *öğren-* 'learn' and *hatırla-* 'remember', which can be used with either *-mAK* or *-mA* when the subject of the embedded verb is the first person singular and the subject of the matrix verb is co-referential. When such verbs are used with *-mA*, the possessive suffix is in the form of the third person possessive. A detailed analysis of this idiosyncratic behaviour of *-sI* can be found in Özsoy (1988).

is ambiguous since the subject of the embedded clause may either be Ahmet or someone else.

-mA or *-mAK* nominalizing suffixes are a-temporal; their temporal reference is mostly dependent on the tense of the matrix verb. The temporal values of *-DIK* and *-(y)AcAK* nominalizing suffixes are controversial, which will be discussed in detail in the following section.

1.4.1. Different approaches to complementation in Turkish

In this section, the previous works on complementation in Turkish will be briefly discussed. There are basically two different approaches to complementation in Turkish, one semantically, the other syntactically oriented. The semantic approach is more descriptive; it emphasizes the semantic properties of the verb as the determining factor in the choice of the nominalizing morpheme. The syntactic approach is followed by Underhill (1976), Kornfilt (1984), Kural (1994), and Tosun (1999). The semantic approach is adopted by Taylan (1998a, 1998b), Özsoy (1999) and Schaaik (1999).

1.4.1.1. Syntactic approach

According to Underhill (1976), the main difference between *-mA*, *-DIK* and *-(y)AcAK* is that *-mA* is an action nominal whereas *-DIK* and *-(y)AcAK* are factive nominals. Kornfilt (1984) follows Underhill and classifies *-DIK* and *-mA* as participial forms, a factive nominal and an action nominal, respectively. Kennelly (1990) presents a similar view but deals mainly with the aspectual differences between *-DIK* and *-(y)AcAK* according to the feature [±future]. She proposes that *-DIK* is used when the embedded clause is [-future] and *-(y)AcAK* is used when it is [+future].

Kural (1994) classifies *-mA* and *-mAK* as infinitive, *-DIK* as the past and *-(y)AcAK* as the future morphemes. He further claims that the final *-K* in these morphemes belongs to the C° category and is the complementizer in Turkish. He claims that *-DIK*, *-(y)AcAK* and *-mA* morphemes are gerundive due to the following properties of Turkish complement clauses (Kural 1992: 3):

1. Subjects bear the genitive case in this context.
2. Subject-verb agreement is in the nominal paradigm.
3. All subordinate clauses are and must be case marked.

Kural accounts for the difference between *-mA* and *-mAK* by claiming that *-mA* is used "in contexts of subject-verb agreement where the subject needs case and *-mAK* in non-agreement contexts" (1992: 9). I do not fully agree with Kural in that the choice between *-DIK* and *-(y)AcAK* is only due to the difference between past and future reference since this choice is also determined by the matrix verb, for reasons I will discuss later.

1.4.2. Semantic approach

As mentioned earlier, the main difference between semantic and syntactic approaches to complementation in Turkish is that in semantic approaches it is the semantic properties of the matrix predicate that are claimed to play a determining factor in choosing the nominalizer.

Taylan (1998a) claims that the semantic properties of the matrix predicate play a major role in determining the nominalizing suffix together with the semantic properties of the nominalizing suffixes. Taylan classifies *-DIK*, *-(y)AcAK* and *-mA* complement taking predicatess into the following subcategories according to the nominalizing suffix they choose in their complement clause:

i) Predicates that only allow *-DIK/-(y)AcAK* as the nominalizing suffix:
sanmak 'to guess', *zannetmek* 'to guess', *fark etmek* 'to realize', *farkına varmak* 'to realize', *inanmak* 'to believe', *reddetmek* 'to deny', *itiraf etmek* 'to admit', *iddia etmek* 'to claim', *emin olmak* 'to be sure', *pişman olmak* 'to regret'.

ii) Predicates that take nominalized complement clauses constructed only with *-mA*:
a. *emretmek* 'to command', *istemek* 'to want', *talep etmek* 'to request', *arzu etmek* 'to desire', *dilemek* 'to wish', *umut etmek* 'to wish', *beklemek* 'to wait'.
b. *lazım* 'necessary', *gerek* 'necessary', *şart* 'required', *mecbur olmak* 'to be compelled' , *mecbur kalmak* 'to be forced to', *izin vermek* 'to give permission', *müsaade etmek* 'to give permission', *yasaklamak* 'to forbid', *engellemek* 'to prevent', *önlemek* 'to prohibit' , *mümkün* 'possible', *olası* 'probable'.
c. *beğenmek* 'to like', *sevmek* 'to love', *bayılmak* 'to adore', *hoşlanmak* 'to like', *kızmak* 'to get angry', *nefret etmek* 'to hate', *alınmak* 'to be offended', *eleştirmek* 'to criticise', *utanmak* 'to be ashamed', *canı sıkılmak* 'to be bored', *övmek* 'to praise', *affetmek* 'to forgive', *öğütlemek* 'to advise', *katlanmak* 'to bear', *yararlanmak* 'to take advantage of', *şikayet etmek* 'to complain'.

iii) Predicates that accept either *-DIK/-(y)AcAK* or *-mA* as the nominalizing suffix:
sevinmek 'to be happy', *üzülmek* 'to be sad', *memnun olmak* 'to be glad', *şaşırmak* 'to be surprised', *bozulmak* 'to be upset', *içerlemek* 'to resent', *ısrar etmek* 'to insist', *kabul etmek* 'to accept' , *hatırlamak* 'to remember', *bilmek* 'to know', *anlamak* 'to understand', *bildirmek* 'to notify', *korkmak* 'to be scared'.

Taylan states that this list exhibits a natural classification. It is not random that all the verbs in (i) allow for *-DIK/-(y)AcAK* nominalization only. All of the verbs in (i) express the speaker's epistemic attitude, that is his/her commitment to the truth of the statement. The verbs in the second class (ii, a) all express modal notions such as command, request, wish, desire. The predicates in (ii, b) also express modal notions, but this time obligation, necessity, permission and probability. The predicates in (iic) reflect the speaker's emotional reaction or personal attitude to the event. The verbs that take either *-DIK/-(y)AcAK* or *-mA* can be divided into two classes: those matrix predicates expressing the speaker's personal reaction to the event and not showing a

meaning difference (as *sevin-* 'to be happy'); and cognitive/perceptual verbs that bring about a meaning difference whether they are used with *-DIK/-(y)AcAK* or *-mA* (as *unut-* 'to forget').

The following example shows the meaning difference caused by the use of different nominalizing suffixes with the same matrix verb. Whereas in the first sentence the speaker remembers the fact that they met, in the second sentence s/he remembers how they met, that is the details of their meeting.

(11) *[Tanı-ş-tığ-ımız-]ı* *hatırla-dı-m.*
know-RECIP-DIK-POSS1P-ACC remember-PAST-1S
'I remembered that we have met.'

(12) *[Tanı-ş-ma-mız-]ı* *hatırla-dı-m.*
know-RECIP-MA-POSS1P-ACC remember-PAST-1S
'I remember our meeting.'

To sum up, this approach shows that the nominalizers have their own meaning and that the meaning of the nominalizer plus the matrix verb gives the full meaning of the utterance.

Özsoy (1999) states that the matrix predicate subcategorizes the nominalizing affix it assigns to its complement verb. She makes a distinction between verbs that take *-DIK* and *-(y)AcAK* as expressing factivity and verbs with *-mA*[6] and *-mAK* as expressing non-factivity, such as wish, manner, appreciation (Özsoy 1999: 156). The difference between *-DIK* and *-(y)AcAK* is captured by the fact that *-DIK* expresses an action (i) that has occurred in the past with respect to the time of speaking or (ii) that it is simultaneous with or that has preceded the situation referred to in the main clause. Özsoy provides the following examples for the different temporal interpretations of *-DIK* (Özsoy 1999: 56):

(13) *Ben [Ayşe'nin şimdi kitap oku-duğ-u-]nu bil-iyor-um.* (present reference)
I Ayşe-GEN now book read-DIK-POSS3S-ACC know-PROG-1S
'I know that Ayşe is reading a book now.'

(14) *Ben [Ayşe'nin dün git-tiğ-i-]ni bil-iyor-um.* (past reference)
I Ayşe-GEN yesterday go-DIK-POSS3S-ACC know-PROG-1S
'I know that Ayşe left yesterday.'

[6] Özsoy accounts for the possessive marker on the possessed impersonal infinitive as being base generated. It is distinct from the possessive marker assigned by the genitive marker on the embedded subject, which is in accordance with the predictions of Government and Binding theory (Özsoy 1988).

The usage of *-(y)AcAK* is given as expressing an action that will occur in the future with respect (i) to the moment of utterance and/or (ii) to the time of the action indicated by the matrix predicate. To quote her own examples (Özsoy 1999: 56):

(15) *Ben [seçim-ler-in gelecek yıl yap-ıl-acağ-ı-]nı san-ıyor-um.*
I election-PL-GEN next year do-PASS-(Y)ACAK-POSS3S-ACC guess-PROG-1S
'I guess the elections will be held next year.'

(16) *Biz [kantin-in dün kapa-n-acağ-ı-]nı unut-muştu-k.*
We canteen-GEN yesterday close-PASS-(Y)ACAK-POSS3S-ACC forget-PLUPERF-1P
'We forgot that the canteen would close yesterday.'

Schaaik (1999) looks at nominalizations from the viewpoint of Functional Grammar, and he also concludes that it is according to the matrix predicate type that the embedded clause is nominalized.

To sum up, the semantic analysis appears to be a better account for Turkish complementation since it is the semantic properties of the complement-taking predicates that play an important role in the choice of the nominalizing suffix rather than the temporal values of the nominalizing suffixes. As has been noted by the meaning differences that result from the choice of nominalizing suffixes, there are certain inherent semantic properties of nominalizing suffixes, but it is mainly the matrix verb which selects the nominalizing suffix.

The work that paved the way for the topic of this study was Aksu-Koç's (1994) paper on children's use of complement clauses in *Frog Stories*. In this study, the subjects were between ages 3 and 5. She also collected data from 9-year-olds and an adult group. She concluded that complement clauses other than infinitival complements with *-mAK* are late to appear in the children's narratives. She reports that nominal constructions with *-mAK* are quite frequent in the data and they mostly occur with modal verbs such as *iste-* 'want' and *çalış-* 'try' at age 3. *-mAK* is used with aspectual verbs such as *başla-* 'start' and *devam et-* 'continue' at age 5. She points out that *-DIK* complements where the matrix predicate is a cognitive/perceptual verb such as *bil-* 'know', *anla-* 'understand', *gör-* 'see', *farkında ol-* 'be aware of' occur occasionally in the preschool texts. Aksu-Koç (1994: 380) asserts that "*-DIK* constructions appear to pose problems, particularly when the matrix predicate is the irregular verb *ol-* 'be' with its existential form *var/yok* 'exist/not exist". She reports that *-mA* complementation was only encountered once in the *Frog Stories* with the matrix predicate *söyle-* 'tell' at age 9. Aksu-Koç further points out that the difficulty of *-mA* clauses is probably due to conceptual rather than syntactic complexity per se. *-(y)AcAK* nominalizations are not produced by any of the children, even the 9-year-olds in this particular narrative data. She attributes the scarcity of *-mA*, *-DIK* and *-(y)AcAK* to a rather specialized discourse function.

1.4.3. Acquisition of complementation from a cross-linguistic perspective

The aim of this section is to review the works on the acquisition of complementation in languages such as English, Korean and Chinese.[7] The similarities and differences between complementation in these languages will be discussed. Studies on English complementation by Fodor, Garrett & Bever (1968) demonstrated that complement taking verbs are inherently more difficult than simple transitive verbs even for adults to process. Limber (1973) studied 12 children under three years of age and found that *want*-type verbs were one of the first verbs children used in infinitive structures.

Chomsky (1981), within the framework of Government and Binding Theory proposed that 'control' construction is the unmarked case for infinitives. In the GB theory, language acquisition is seen as the process of setting the values of 'parameters' which are innate and are initially set to unmarked values. The marked case must be learned, whereas the unmarked case is what the language learner will assume to be in effect in the absence of evidence to the contrary (Chomsky 1981: 8). Since marked constructions are added on the basis of direct evidence they are acquired later and more slowly (Chomsky 1981:11).

Pinker (1984) proposes a rough ordering of acquisition of complement structures in English:

1. control verbs such as *want, like, try, forget* at around 2;0 (MLU 1.3- 2.6), e.g. *I want to sit down.*
2. object-equi verbs such as *see, watch, help, tell,* e.g. *I helped him leave.*
3. verbs taking full sentential complements such as *think, know, show, explain,* e.g. *I think she is sick.*
4. raising-to-object verbs such as *want* at around 3;0 (MLU 4.0-4.5), e.g. *I want Mommy get it.*

Pinker (1984) points out that English-speaking children also use bare verbs in their first complement structures, which is grammatical with some verbs. But it is often ungrammatical when they omit *to* in infinitival complement constructions.

Bloom et al. (1984) studied the spontaneous speech samples of four children under the age of three and reported the production of two other verbs in addition to *want*. They noted that *like* and *need* also take infinitives with lexical subjects. In Bloom et al. (1989) it is suggested that the acquisition of complementation began between 2 and 3 years in the four children's spontaneous speech. The most frequent verbs acquired were the perception verbs *see* and *look* and the epistemic verbs *think* and *know*. Their conclusion was that children learned lexically specific rules rather than learning a general rule for complementation per se. They also concluded that "The plurifunctionality of *that* may have inhibited its acquisition as a complemen-

[7] Similar acquisition studies were done by Hollebrandse et al. (2001) for Italian complementation and by Pérez-Leroux (2001) for Spanish complementation.

tizer, since an item with more than one function within a sentence presumably increases perceptual difficulty" (Bever 1970 cited in Bloom et al. 1989).

Bloom (1991), in another study on complementation in English, suggests that there is a clear sequence in children's ability to produce verb complements. She concluded from the naturalistic data that children begin with simple object complements then progress to infinitival complements. Following Bloom (1991), Eisenberg & Cairns (1994) worked on the production of infinitival structures of children from 3;7 to 5;4. They concluded that adult-like command of the infinitival form was not complete even with five-year-olds. In another study, Roeper & deVilliers (1994) argued that 4- and 5-year-old English children cannot differentiate between the finite complement clauses which are marked with *that* and infinitive *to* complements. They showed that 4- and 5-year-old children were not able to distinguish between the sentences *Who did Big Bird forget to invite?* and *Who did Big Bird forget that he invited?*. The children were able to understand the infinitival *to* complementation before they could understand tensed complements marked with *that*. Bartsch & Wellman (1995), who worked with ten English children, claimed that English-speaking children acquire mental state verbs much later than verbs of desire and emotion. The talk about beliefs requires a more complex syntax which was also pointed out as a cause for the rather late acquisition for belief verbs. One major claim is that children develop from a "desire psychology" to a "belief psychology" as they are developing a "theory of mind"[8] (Tardif & Wellman 2000). Children first understand simple wants and needs before understanding others' representations of the world.

There are also studies on the acquisition of complementation in typologically different languages. Kim's (1989) work is one of the first detailed accounts of the acquisition of complement structures in Korean. Kim worked on the spontaneous speech data of two children observed from 1;5 to 3;0 years. In Korean, complementizers are either bound morphemes suffixed to the embedded verb or null morphemes. Kim notes that the first complement clause was produced at 1;9 by both of the subjects. Kim reached the conclusion that control verbs are the first to be acquired in Korean as in English. The similarities between the acquisition of Korean and English complementation are summarized by Kim as follows (Kim 1989: 576): 1. Control constructions are the first to be acquired in both languages; 2. Tensed complements are acquired considerably later than control type infinitival complements; 3. Both English- and Korean-speaking children initially used a small group of matrix verbs to express moods, wishes or intentions, in complex sentences.

Korean-speaking children never omit complementizers from their very earliest complement structures—even though they sometimes omit matrix predicates. In contrast, English-speaking children at first omit complementizers in obligatory contexts and then begin to provide them gradually. Pinker asserts that the observed dif-

[8] Theory of Mind can be defined as a framework which studies people's capacity to form representations of other people's mental states and processes.

ference between the two languages is due to the fact that "English complementizers are perceptually non-salient, they are not uttered in isolation or sentence initial or sentence final position" (Pinker 1984: 224).

Tardif & Wellman (2000) worked on the acquisition of verbs denoting mental states for Mandarin- and Cantonese-speaking children. They wanted to test whether Bartsch & Wellman's conclusions about children's Theory of Mind were also valid for Chinese-speaking children. However, in Chinese, there is no obligatory marking of the complement clauses as infinitival or finite. Since there is no syntactic complexity involved with the mental state verbs in Chinese as there is in English[9], the late acquisition of mental state verbs in Chinese showed that it is the psychological load that makes it difficult for children to acquire mental verbs in complement structures.

To sum up, works on the acquisition of English and Korean complementation showed that control constructions are the first constructions that are acquired. Korean children never omit complementizers, whereas English children first start with omitting complementizers in obligatory contexts. When we compare Chinese and English, we see that *want*-type complementation is acquired first in both languages. Tensed complements are acquired later than infinitival complements by both English- and Korean-speaking children. English children learn lexically specific rules for complementation (Bloom et al. 1989). These results follow children's developments in 'Theory of Mind' since it seems that in all these languages children acquire verbs of desire before mental verbs. The age at which children acquire their first complement structures is about 2;0 in the three languages studied.

2. Method

2.1. Sample for the experimental data

Previous studies examining naturalistic data (Altan 2005) showed that *-mAK* complements with the complement taking verb *iste-* 'want' are the first to appear in the child's speech. Children acquire *-mAK* nominalizations in the period 2;0-3;0. In the naturalistic data the second nominalizing suffix acquired by children was found to be *-mA*. The *-mA* nominalizer was used with the matrix predicates *iste-* 'want', *gerek* 'necessary', *bil-* 'know', *öğren-* 'learn' and the predicate *lazım* 'necessary'. These data suggest that children start acquiring *-mA* nominalization at about 3;0. The complement clauses nominalized with *-DIK* appeared less frequently than *-mA* nominalizations; only one of the subjects produced *-DIK* at the age of 4;4 with the matrix verb *gör-* 'see'. Among the children studied, only one of the children produced *-(y)AcAK*

[9] In English the syntax required for desire verbs is simpler than that required for mental verbs since the latter require a finite embedded verb introduced by the optional complementizer *that*.

nominalized complements with the matrix predicate *söyle-* 'tell' at 3;1. Object complements emerged before subject complements in the naturalistic data.

Naturalistic data may be claimed to be insufficient to analyze the production and comprehension of complement clauses. It may be that the child does not use complement clauses not because s/he does not know the structure, but because there is no context for that use. Therefore, in this study four experiments were carried out. Not only the production but also the comprehension of complement clauses was tested in these experiments. There were two production experiments, one comprehension experiment and one imitation experiment. The matrix predicates used in the experiments were selected from the verbs that children most frequently used, as given in the list of verbs children use between the ages 2 and 4 (Ketrez 1999).

12 children from every age group between 3 and 6;0 and 6 children from 6;0 to 6;6 years were tested. In selecting the children, care was taken to have equal number of children to represent the younger and the older halves of each age group. There were equal numbers of males and females in each group. The sample was limited to the pre-school period. A total of 42 children were included in the study. The age groups are as follows:

Group 1:	3;0- 3;11,30	(12 children)
Group 2:	4;0- 4;11,30	(12 children)
Group 3:	5;0- 5;11,30	(12 children)
Group 4:	6;0- 6;5,30	(6 children)

2.2. Experimental tasks

Four different experiments were conducted.

2.2.1. Production task 1: Picture description using different matrix verbs and scoring

This experiment aimed to assess children's capacity for producing complement clauses. This type of method was previously suggested by Anderson (2000). The experimenter laid down two pictures and then turned over her picture and described what it depicted using a complex sentence with a complement clause. Then the child was asked to describe his/her picture in the exact same way the experimenter had described her own. There were two pictures for each item, both of which were similar and describable by using the same matrix verb. Both the embedded verb and the object of the embedded verb were different in the child's picture.

This experiment has two training sentences and seven main items. Two of the items had *-mA*, two *-mAK* and three *-DIK* nominalizers. The matrix predicates that were used are *iste-* 'want', *çalış-* 'try', *bil-* 'know', *sevin-* 'be pleased', *söyle-* 'tell', *gör-* 'see', *şaşır-*'be surprised'.

The maximum score in this task was seven. There were three *-DIK*, two *-mA* and two *-mAK* complements, for which the scores were calculated. If children made any alternations in the matrix predicate or in the nominalizer it was noted. The verb *bil-*

'know' can be used with both *-mAK* and *-mA*. However, since the model item of the experimenter was with *-mA*, the child was also expected to use *-mA*. All responses other than the expected ones were considered incorrect. The matrix predicate *sevin-* 'be happy' can be used either with *-DIK* or *-mA* in Turkish without any meaning difference. But similarly, since the child was given *-DIK* in the model sentence, *-mA* was not considered correct. If the child did not use any complementizer or s/he deleted the matrix predicate, the utterance did not get any points.

2.2.2. Production task 2: Changing to indirect speech and scoring

This task was designed to test children's capacity to produce complement constructions by asking the child to transform the direct speech clause into indirect speech. The items of the task consisted of brief episodes of cartoon characters, Ernie and Bernie, represented on two or three pictures. For example, one item consisted of a picture showing Ernie taking a bath, and a second picture showing him standing in his bathrobe and saying something to Bernie. The experimenter quotes what one of the characters says to the other. In order to make sure the child produces a complement construction, the experimenter provides one of the frames *Edi ne yaptığını/ yapacağını/ yapmasını söyledi?* 'What did Ernie say he had done/ will do/ to do?' in her question. Here, since the framing question contains a complement, this may be seen as giving a clue, but a correct answer requires productive knowledge since the child has to answer by using a different verb in the embedded clause, choosing the appropriate nominalizing suffix and the correct form of the possessive suffix. Pilot testing showed that eliciting the target forms was not possible otherwise, since children tended to repeat the direct speech sentence. The framing question used the verb *yap-* 'do' for the embedded clause, and *söyle-* 'tell' for the matrix verb in each item.

The task included six items plus two warm-up items. The warm-up sentences were formed with the matrix predicate *iste-* 'want'. When the child understood the task, s/he was given the test items with the matrix predicate *söyle-* 'tell'. The embedded verbs were chosen from a list of verbs children of this age range know; *uyu-* 'sleep', *bul-* 'find', *banyo yap-* 'have a bath', *yıka-* 'wash', *hediye al-* 'buy a present', *kaybol-* 'get lost'.

Two *-DIK*, two *-(y)AcAK* and two *-mA* nominalization sentences were tested in this experiment. The *-DIK* and *-(y)AcAK* clauses have a factive reading with the matrix predicate *söyle-* 'tell'; however, *-mA* clauses have an imperative reading when used with the verb *söyle-* 'tell'. In this way, the child's knowledge of different nominalizers carrying different meanings with the same matrix verb was also tested.

There were 6 items on this task. Converting the direct speech sentence into the indirect counterpart as the framing question was counted as correct performance. Full points were given to answers with the matrix verb *söyle-* 'tell', correct embedded verb with the appropriate nominalizing suffix and the correct form of the possessive suffix. Correct performance on each item received 1 point. Thus, the maximum total score that could be obtained was 6 points.

In addition to the total score, different scores were calculated for *-mA*, *-DIK* and *-(y)AcAK* items. There were two items for each nominalizer. Each item was worth one point. If the child did not change the clause into indirect speech but just repeated what the experimenter said, the answer did not receive any points. For the fifth item, if the child said *Banyo yaptığını söyledi* 'He said he had a bath' instead of *Banyodan çıktığını söyledi* 'He finished his bath', then that was also considered correct. If the child changed the matrix predicate to *iste-* 'want' but used the correct nominalizer, that was also considered correct. If the child used the wrong nominalizer, then no points were awarded, since the verb *söyle-* 'tell' leads to a different interpretation with different nominalizers. The instances in which the child used different nominalizers with verbs that result in different meanings were noted. The errors will be examined qualitatively in order to understand children's preferred strategies.

2.2.3. Comprehension task

The comprehension task tests whether the child understands the embedded structure and can produce the direct speech counterpart of it. The basic outline of this experiment was first made by Clain and Nakayama (1987; cited in Thornton 1996) and revised by Thornton (1996). The child is presented with a mouse puppet too shy to speak with grown-ups, so the child should help her by asking some questions on the experimenter's behalf. Then the child is given indirect speech sentences with complement structures like *Fareye ne yemek istediğini sorar mısın?* 'Could you ask the mouse what he wants to eat?' and asked to talk to the mouse. Only if the child understands the syntax and semantics of the complement structure can he produce the simple, direct question counterpart *"Ne yemek istersin?"* 'What would you like to eat?'

There were 7 items that involved single nominalization constructions. In addition, 3 syntactically more complex sentences, that is, the sentences that involve double nominalizations such as *Kutuda ne olduğunu sandığını sorar mısın?* 'Can you ask the mouse what he thinks there is in the box?' were also tested. The yes-no question forms that are constructed by using complement clauses were also tested in this experiment by such sentences as *Fareye dün okula gidip gitmediğini sor* 'Ask the mouse whether he went to school yesterday or not'. *-DIK*, *-(y)AcAK* and *-mA* clauses were all used in the experiment.

In this task, the maximum total score is 13 points. Seven of the questions were scored as either 1 or 0 depending on whether the child gave correct or incorrect answers. If the child repeated the experimenter's sentence then the response did not get any points. Three of the questions were given 2 points since they included double nominalizations and therefore were syntactically more difficult than the other items. In these items, if the child comprehended the structure but did not produce double nominalizations, then only 1 point was given. To illustrate, for the third item *Fareye ne yaptığını sana anlatmasını söyle* 'Tell the mouse to tell you what he has done' if the child's answer is *ne yaptığını anlat* 'Tell me what you have done' then the answer

got full points, that is 2 points. But if s/he said *ne yaptın?*'What did you do?' then only 1 point was awarded since it is assumed that s/he understood the construction.

2.2.4. Imitation task

The fourth experiment consists of an imitation task with the assumption that imitation of a structure is a proof that the structure is part of the child's grammatical competence. As Lust, Flynn & Foley (1996: 56) put it, "imitation is not a passive copy, but a reconstruction of the stimulus". Or in Chomsky's words "the child's ability to repeat sentences and nonsentences might provide some evidence as to the underlying system that he is using" (Chomsky 1964: 39). Thus, the child's ability to correctly reproduce a given sentence can be taken as evidence for his/her comprehension as well as a certain level of productive control over the sentence.

Each child was given 12 complex sentences with complement-taking verbs and was asked to repeat them immediately after the experimenter. The length of the sentences varies from 7 to 11 syllables, approximately 4-5 words. Negative and question forms were excluded. Several training sentences were given to ensure the child fully understood the task.

In this task, the maximum score was 12; correct repetition of each item was given one point. The children were evaluated according to whether they gave no response, a correct response or a modified response. The alterations children made to the sentence while repeating were recorded and noted. The modification or deletion of the nominalizer or the matrix verb was considered incorrect. If the child made any modification to the case of any constituent or changed the word order of the sentence that was noted, but the same points were awarded as for a correct response.

2.3. Procedure for the experimental tasks

The experiments were carried out in four different kindergartens, Boğaziçi, Koza, Ayışığı and Happy Kids, which children of middle and upper-middle class families attend. In order to familiarize herself with the children, the experimenter spent some time in the class playing, talking with the kids and also participated in games. Then each child was invited to the room to play. Each child was seen individually, and the testing session was recorded. The recorded material was transcribed and then analyzed. Each child was praised regardless of his/her performance. The children were told they were free to stop playing and go back to their classroom if they did not like the game. After each experiment, stickers were given to the child as a reward. Both the order of experiments and the order of items in each task were randomized. That is, each child was presented a different order of experiments, and within each experiment the order of items was different.

3. Results–Experimental data

3.1. Analysis of the data

In this section results obtained from the analysis of experimental data will be presented. A total of 42 children from four different age groups were tested. Three of the age groups, 3-, 4- and 5-year-olds were made up of 12 children[10]. The fourth group, 6-year-olds, consisted of 6 children. The age groups and their scores on nominalizations were compared. Analysis of variance (ANOVA) was carried out to see how children of different age groups performed on different tasks, assessing their knowledge of complement structures.

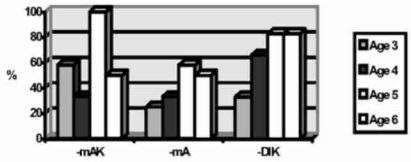
3.2.1. Production task 1: Picture description using different matrix verbs

The first production task involved a total of 7 items, 1 point each. In this task there were two *-mAK* complements, two *-mA* and three *-DIK* complements. A one-way analysis of variance (ANOVA) with age as the independent variable was carried out on total scores. This analysis yielded significant effects of age [F (3,38)=4.09, p<.013]. 5-year-olds scored higher than other age groups, and the 3-year-olds scored the lowest. The crucial difference between 4- and 5-year-olds suggests that there is a jump in children's understanding of complementation between ages 4 and 5. The fact that 6-year-olds scored lower than 5-year-olds may be due to factors such as lack of attention.

Another ANOVA was carried out to see whether the children's performance on different complementizers varied significantly by age. The analysis revealed a significant effect of age on the production of *-mAK* nominalizations [F (3,38)=4.09, p<.025]. However, *-mA* scores showed no significant effect of age [F (3,38)=2.25, p<.098] and neither did *-DIK* scores [F (3,38)=2.44, p<.079]. Although the results were not significant, the mean for the items that involved *-mA* and *-DIK* nominalization of 3- and 4-year-olds were different than that of 5- and 6-year-olds, suggesting that age has a role in their acquisition.

When the scores obtained from *-mAK*, *-mA* and *-DIK* items by different age groups were compared by mean, it was observed that the percentage of correct responses to *-mAK* complements was higher than *-mA* and *-DIK* for all age groups. When *-mA* and *-DIK* scores were compared, it was seen that children's scores were higher for the *-DIK* items.

[10] Analyses with breakdown of age groups into 6-month periods such as 3;0-3;6 and 3;6-4;0 did not reveal any significant results.



Graph 1: Comparison of *-mAK*, *-mA* and *-DIK* items by age

Graph 1 illustrates that 3- and 5-year-olds performed better in *-mAK* nominalizations when compared to *-mA* and *-DIK*. It is also interesting to note that all 5-year-olds correctly produced *-mAK* nominalizations, which indicates that *-mAK* nominalization is fully acquired by that age. The fact that 6-year-olds did not perform as well as 5-year-olds was due to their lack of attention; they were more interested in details such as the clothes of the depicted characters. In all age groups, *-mAK* and *-DIK* scores were very close to each other. The fact that 5- and 6-year-old children were able to perform 82-83% of the *-DIK* items suggests that by this age children have acquired *-DIK* nominalizations. This graph also shows that *-mA* items were difficult even for 5- and 6-year-olds, who could only produce 50-55% of all *-mA* items.

The use of different matrix verbs that may have an effect on the children's scores was also analyzed. There were seven different matrix verbs in this task. The percentage of children who correctly produced *-mAK* with the matrix predicate *iste-* 'want' is higher for all age groups than the percentage of children who correctly produced *-mAK* with the matrix predicate *çalış-* 'try'. Since the nominalizer is *-mAK* for both matrix verbs, the difference in performance may be due to the type of the matrix predicate. There are two reasons that come to mind when we analyze why children performed better with the matrix predicate *iste-* 'want'. First, *çalış-* 'try' assigns dative case, which makes the structure grammatically more complex. 60% of the children who made errors with the verb *çalış-* 'try' failed to use the dative suffix, which resulted in errors. To illustrate:

(17) EXP: *Çocuk ağac-a çıkmağ-a çalış-ıyor.*
child tree-DAT climb-MAK-DAT try-PROG
'The child is trying to climb the tree.'

CHI: **Çocuk bisiklete binmek çalışıyor.* (Yasemin 4;3,15)
child bicycle-DAT ride-MAK try-PROG
'The child is trying to ride the bicycle.'

The second reason for the errors of the children may be due to the semantic difference between these two verbs. *Çalış-* 'try' is an aspectual verb; the action has started but is not finished yet at the time of speaking. *İste-* 'want' is a desire verb that children acquire rather early.

The results illustrated that most of the children preferred *-mAK* rather than *-mA* with the matrix predicate *bil-* 'know'. *Bil-* 'know' has an idiosyncratic property since it allows for a complement to be nominalized with either *-mA* or *-mAK* when it is a control structure. In the task, the child was given an instance where *bil-* 'know' was used in such a control structure with the nominalizer *-mA*. The children probably preferred the *–mAK* nominalization since it is simpler and since they have formed the rule that control structures are expressed by *-mAK* complements. The children probably have not yet acquired this idiosyncratic property of *bil-* 'know'. To give an example of a child who has preferred to use *-mAK*:

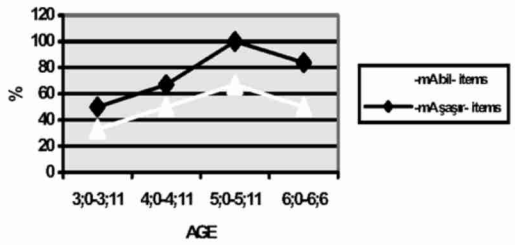
(18) EXP: *Ahmet yüz-me-si-ni bil-iyor.*
Ahmet swim-MA-POSS3S-ACC know-PROG
'Ahmet knows how to swim.'

CHI: *Ahmet balık tut-ma-yı bil-iyor.* (Can 6;0,18)
Ahmet fish catch-MA-ACC know-PROG
'Ahmet knows how to fish.'

When we look at the performance of children on the matrix predicate *şaşır-* 'be surprised', we see that only two children among all subjects chose the wrong complementizer, preferring *-DIK* complements rather than *-mA*. Actually, there is no particular meaning difference caused by using *-DIK* rather than *-mA* complement clause with the matrix predicate *şaşır-* 'be surprised'. However, as has been described in the method section, the child was expected to use the same complementizer as the experimenter, so the response was counted as wrong although this was simply a preference. To give an example to this preference:

(19) EXP: *Ayşe'nin kayığ-a bin-me-si-ne şaşır-dı-m.*
Ayşe-GEN boat-DAT get on-MA-POSS3S be surprised-PAST-1S
'I was surprised that Ayşe got on the boat'

CHI: *Ayşe'nin merdiven-e çık-tığ-ı-na şaşır-dı-m.* (Ali K 4;2,5)
Ayşe-GEN stairs-DAT get on-DIK-POSS3S be surprised-PAST-1S
'I was surprised that Ayşe climbed the stairs.'



Graph 2: Percentage of correct answer to *-mA bil-* 'know' and *-mA şaşır-* 'be surprised' by age

We observe from the graph that there was an increase in performance by age in the production of *-mA* complement clauses with the matrix predicates *bil-* 'know' and *şaşır-* 'be surprised', except for the 6-year-olds. When performance in terms of the matrix predicates was compared, it was seen that all age groups performed better with the matrix predicate *şaşır-* 'be surprised'. This may also be due to the type of the complement-taking verbs; *şaşır-* 'be surprised' is an emotion verb while *bil-* 'know' is a mental verb.

The matrix predicate *sevin-* 'be happy' can either be nominalized with *-DIK* or *-mA*, without any meaning difference. In the experiment it was presented with the nominalizer *–DIK,* so the child was expected to use *-DIK*. But nearly all of the children preferred to use the nominalizer *-mA* with *sevin-* 'be happy'. To give an example:

(20) EXP: *Ali'nin yatak-ta yat-tığ-ı-na sevin-di-m.*
Ali-GEN bed-LOC sleep-DIK-POSS3S-DAT be happy-PAST-1S
'I was happy that Ali was lying in the bed.'

CHI: *Ali'nin dans et-me-si-ne sevin-di-m.* (Cankat 3;4,6)
Ali-GEN dance do-MA-POSS3S-DAT be happy-PAST-1S
'I was happy that Ali was dancing.'

None of the children from any age group substituted another nominalizer instead of *-DIK* for the matrix predicate *gör-* 'see'. These findings show that they learn each verb with the nominalizer it selects and in their mind the matrix predicate *sevin-* 'be happy' is matched with *-mA*, while *gör-* 'see' is matched with the *-DIK* nominalizer.

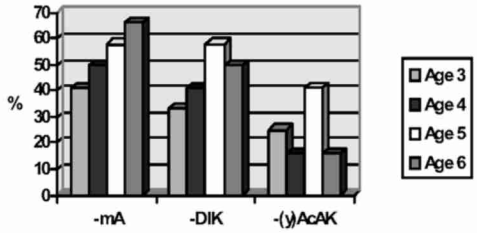
The matrix predicates that take both *-mAK* and *-DIK/-(y)AcAK* complements were also tested. To illustrate, *söyle-* 'tell' takes both *-mA* and *-DIK/-(y)AcAK* nominalizers in Turkish. When *söyle-* 'tell' takes a *-mA* complement, it takes on an imperative meaning. When it takes a *-DIK* complement, it takes on a factive meaning. Thus, this experiment also aimed to see whether the child is able to distinguish the factive versus non-factive interpretation of such sentences. The framing sentence *Ayşe kardeşinin uyuduğunu söyledi* 'Ayşe said that her brother was sleeping' is given to the child, who is then asked to describe his/ her picture. In the child's picture a girl who is saying that her sister was jumping rope is depicted. Thus the child is expected to say *Ayşe kardeşinin ip atladığını söyledi* 'Ayşe said that her sister was jumping rope'. If the child chooses *-mA* instead of *-DIK* for his/her sentence, then the sentence takes on an imperative meaning. Some of the children chose *-mA* nominalization, which indicates that they have not yet acquired the meaning difference caused. The reason for this modification can also be that imperative reading is easier for children to comprehend than the factive interpretation, since they probably hear imperative statements more often than factive statements.

Children's performance on the production of *-DIK* nominalizations with the matrix predicates increases with age, except for 6-year-olds, who show a decrease in

performance with the matrix predicate *sevin-* 'be happy'. However, the reason for the errors of 6-year-olds was that they preferred *-mA* complements with *sevin-* 'be happy'. The reason for this preference may be that *sevin-* 'be happy' is an emotion verb, and most emotion verbs in Turkish are nominalized with *-mA*. There are also differences in the performance of children with respect to the choice of the matrix predicate. The correct answer percentage was higher for all age groups with the matrix predicate *gör-* 'see', which is a perception verb, when compared to the emotion verb *sevin-* 'be happy' and *söyle-* 'tell', a verb expressing indirect speech.

3.2.2. Production experiment 2: Changing to indirect speech

In this experiment the maximum score that could be obtained was 6: there were 2 *-mA*, 2 *-DIK* and 2 *-(y)AcAK* items; the matrix predicate was *söyle-* 'tell'. A one-way analysis of variance (ANOVA) with age as the independent variable was carried out on total scores. The analysis did not yield significant effects of age on the total score [F (3,38)=.903, p<.443]. No significant effect of age was found in the analysis carried out for *-mA*, *-DIK* and *-(y)AcAK* items separately, either. But the mean for *-(y)AcAK* nominalization was the lowest for all age groups.



Graph 3: The correct answer percentage of *-mA*, *-DIK* and *-(y)AcAK* items with the matrix predicate *söyle-* 'tell'.

As stated earlier, the matrix verb in this task, *söyle-* 'tell', takes on an imperative interpretation with *-mA* complements whereas, with a *-DIK* or *-(y)AcAK* complement, it obtains a factive interpretation. Graph 3 illustrates that 3- and 4-year-old children performed better with the *-mA* nominalizer, that is, the imperative reading. 5-year-olds showed nearly no difference between *-DIK* and *-mA* nominalizers. When producing *-(y)AcAK* complements, both the younger and the older children made more mistakes in comparison to their production of *-mA* and *-DIK* complements. From a pragmatic point of view, *söyle-* 'tell' with *-mA* complements is probably more common in children's everyday conversations since parents usually request actions from children rather than reporting facts to them.

3.2.3. The comprehension task

The comprehension experiment involved a total of 10 items. 3 of these items involved double embeddings and were awarded 2 points. The other 7 items were single embedding items, worth 1 point each. The maximum total score that could be obtained was 13. A one-way analysis of variance (ANOVA) with age as the independent variable was carried out on total comprehension scores. The analysis yielded significant effects of age [$F(3,38)=3.99$, $p<.014$]. The total scores obtained by the 3- and 4-year-olds were very close to one another as was the mean for the 5- and 6-year-olds. The difference appeared between the ages 4 and 5, suggesting that development of these structures occurs around this age.

Another analysis with age as the independent variable was carried out for the scores of the items with double embeddings. There was no significant effect of age on children's performance on double embedding items [$F(3,38)=2.33$, $p<.090$]. The 6-year-olds scored better than the other groups, but it can be said that the double embedding items were difficult for every age group. Some children comprehended the construction but preferred not to use a double embedding in their answer. To give an example:

(21) EXP: *Fare-ye dün ne yap-tığ-ı-nı san-a*
mouse-DAT yesterday what do-DIK-POSS3S-ACC you-DAT
anlat-ma-sı-nı söyle.
tell-MA-POSS3S tell
'Tell the mouse to tell you what he did yesterday.'

CHI: *Fare dün ne yap-tı-n?* (Lal 3;10,16)
Mouse yesterday what do-PAST-2S
'What did you do yesterday?'

However, some of the older children not only comprehended the double embedding items but also provided a double embedding in their answer:

(22) EXP: *Fare-ye dün ne yap-tığ-ı-nı san-a*
mouse-DAT yesterday what do-DIK-POSS3S-ACC you-DAT
anlat-ma-sı-nı söyle.
tell-MA-POSS3S tell
'Tell the mouse to tell you what he did yesterday.'

CHI: *Fare dün ne yap-tığ-ı-nı biz-e*
Mouse yesterday what do-DIK-POSS3S-ACC we-DAT
anlat-ma-nı istiyorum. (Alp 6;1,9)
tell-MA-POSS2S want-PROG-1S
'Mouse, I want you to tell me what you did yesterday.'

Another ANOVA was carried out with single embedding nominalizations. This revealed a significant effect of age [F (3,38)=3.52, p<.024]. 5-year-olds scored higher than other groups in the single embedding items while 3- and 4-year-olds scored lower than other age groups.

Most of the children preferred negative questions when they were given yes-no question embeddings:

(23) EXP: *Hadi fareye dün okula gidip*
Come on mouse-DAT yesterday school-DAT go-IP
git-me-diğ-i-ni sor.
go-NEG-DIK-POSS3S-ACC ask
'Ask the mouse whether he went to school yesterday or not.'

CHI: *Fare dün okul-a git-me-di-n mi?* (İrem 5;3,8)
mouse yesterday school-DAT go-NEG-PAST-2S QUE
'Didn't you go to school yesterday?'

When the scores of 3- to 4- and 5-year-olds were compared, an increase in their comprehension level as they get older was observed.

3.2.4. Imitation experiment

In the fourth task, which was an imitation task, there were a total of 12 items, 3 items of each complementizer: 3 *-mAK*, 3 *-mA*, 3 *-DIK* and 3 *-(y)AcAK* items. A one-way analysis of variance (ANOVA) with age as the independent variable was carried out on total scores. The analysis did not yield significant effects of age on the total score [F(3,38)=1.42, p<.251]. There was also no significance of age when we look at the nominalizers *-mAK*, *-mA* and *-(y)AcAK*. However, there was a significant effect of age in *-DIK* nominalizations [F(3,38)=2.95, p<.045]. There was an increase in performance by age.

-(y)AcAK nominalizations were difficult to imitate for all age groups when compared to the scores of other complementizers. Most of the subjects deleted the matrix predicate and transformed the embedded verb into a finite form, when imitating the structure:

(24) EXP: *Bu hediye-yi beğen-eceğ-i-ni düşün-üyor-um.*
this present-ACC like-ACAK-POSS3S-ACC think-PROG-1S
'I think you will like this present.'

CHI: *Bu hediye-yi beğen-eceğ-im.* (Rahika 3;3,1)
this present-ACC like-FUT-1S
'I will like this present.'

The scores of *-mA* and *-(y)AcAK* items obtained by 6-year-olds are lower than those of the 5-year-olds. There may be different reasons for this observation. However, it

was observed that they found the task very easy and they lost their concentration very easily.

4. Qualitative analysis of errors and comparison of children's performance on different tasks

In the first Production Experiment, when we compare the performance of children in terms of the type of the matrix predicate, we observe that children performed better on desire and perception verbs. They also performed well on the aspectual verb *çalış-* 'try'. However, children's performance on emotion verbs, mental verbs and verbs of saying was rather low when compared to desire and perception verbs.

When the performance on the verbs that take two different nominalizers without any meaning difference such as *sevin-* 'be happy' was analyzed, it was seen that children have different preferences in the choice of the nominalizer, as mentioned before. This implies that children learn complementizers verb by verb and that some verbs are matched with different nominalizers for different children. Between four to nine percent of the children made case errors, that is they either used a wrong case or did not use any case. Between two to seven percent of the children deleted the matrix predicate and used the embedded verb in finite form.

In the second Production Task, between four to 21 percent of all children failed to change the utterance into indirect speech and instead repeated the direct speech version given by the experimenter. Between two to nine percent of children omitted the case or produced an ungrammatical case. It is interesting to note that 21 percent of the subjects modified the *-DIK* nominalizer and used *-mA* instead. This implies that they have not acquired the meaning difference that is caused by the use of *-mA* versus *-DIK* with the matrix predicate *söyle-* 'tell'. But when they were given *–mA* nominalizer, only four percent of children changed it to *-DIK*, which shows that the imperative interpretation is easier for children. It is also worth noting that only 11 percent of children modified the nominalizer in the *-(y)AcAK* items.

When children's performance in the Imitation Task is analyzed, it is observed that between two and nine percent of all children deleted the matrix predicate and between two and nine percent of children made case errors. There seems to be no difference when we compare their performance with respect to different matrix predicates. Between nine and 11 percent of subjects made modifications in the complementizer.

4.1. Discussion

This study aimed to analyze the acquisition of complementation in Turkish. The analysis is based on the experimental data collected from 42 children. Findings provide suggestions regarding the order in which nominalizing suffixes are acquired. Secondly, the crucial role of complement taking-verbs in the acquisition of the nominalizing suffixes is observed.

These findings are compatible with the results of the studies done for the acquisition of complementation in English and Korean. Pinker (1984) reported that control verbs such as *want, like, try, forget* were the first complement verbs that were acquired by English-speaking children; they were acquired at around 2;0. As in Turkish and English, also in Korean, control constructions are acquired before tensed complements. Studies on acquisition of complementation in Chinese also parallel Turkish data in that emotion verbs and their complements are acquired before mental state verbs. These results imply a universal pattern in the acquisition of mental verbs and their complements, at least for the languages studied.

The first production task showed that the scores of *-mAK* nominalizations when compared to *-DIK* nominalizations were higher for the 3-year-olds. The production of *–mAK* and *-DIK* nominalizations was close to each other for 4-, 5- and 6-year-olds, suggesting that this nominalized structure is acquired between the ages of 4 and 5. On the other hand, *-mA* nominalizations were more difficult than *-DIK* nominalizations for all age groups. This finding may seem to contradict the results of the naturalistic data (Altan 2005), but the matrix predicates were also analyzed to see if the type of verb has an effect on the performance. When *-mAK* items were compared in terms of the matrix predicates they were used with, the percentage of children who correctly answered *-mAK* items with the desire verb *iste-* 'want' was observed to be higher than the percentage of those children who answered *-mAK* items with the aspectual verb *çalış-* 'try'. These findings are compatible with the results of the acquisition study done for Chinese and English in that children acquire verbs of desire and their complements earlier than other complement-taking verbs (Tardif & Wellman 2000).

A comparison of the use of *-mA* nominalizations with the matrix predicates *bil-* 'know' and *şaşır-* 'be surprised' indicate that children of all age groups performed better with the emotion verb *şaşır-* 'be surprised' than they performed on the mental verb *bil-* 'know'. The fact that *bil-* 'know' is a mental verb, which is acquired later than verbs of emotion, is probably the reason for the difference in performance.

When the verbs selecting the *-DIK* nominalizer as their complements are compared, it is observed that the percentage was higher for all age groups with the perception verb *gör-* 'see', as opposed to the emotion verbs and the verb expressing indirect speech, *söyle-* 'tell'. This finding is again compatible with the findings of those studies on the internal state verbs that perception verbs and their complement clauses are acquired earlier than emotion verbs (Bartsch & Wellman 1995). When two emotion verbs, *sevin-* 'be happy' and *şaşır-* 'be surprised', are compared, it is seen that children performed better on the *-mA* nominalized items. The fact that 35 percent of the children preferred *-mA* complements over *-DIK* with the matrix predicate *sevin-* 'be happy' implies that they have generalized the rule that emotion verbs choose *-mA* complements.

The second production experiment expected the children to change the given direct speech utterance into indirect speech. All the items in this task used the same matrix predicate *söyle-* 'tell', which can be nominalized with *-mA*, *-DIK* or *-(y)AcAK,*

resulting in different meanings. When the performances of different age groups in this experiment were compared, it was found that both younger and older children performed better on the *-mA* nominalized items. The reason for this may be that when the matrix predicate *söyle-* 'tell' is used with *-mA* nominalization, an imperative meaning is conveyed. It may be the case that children find the imperative interpretation of the matrix predicate easier than the factive interpretation.

In the comprehension task, the children were expected to understand the complement clause and change it into a simple clause. The total scores obtained by the 3- and 4-year-olds were very close to one another as was the mean for the 5- and 6-year-olds. The difference appears between the ages 4 and 5, suggesting that there is a development of these structures around this age. Both the younger and the older children had difficulty with the items involving double nominalizations.

There appeared to be no significant development as a function of age in terms of the imitation of complement clauses; however, *-(y)AcAK* complements were difficult even in imitation for all age groups, suggesting that they are more complex than other complements.

When we compare the results of the naturalistic data discussed in Altan (2005) with the results of experimental data, we observe that *-mAK* nominalizations are the first form of nominalized structures to appear in the children's speech. The reason for this may be that *-mAK* nominalizations are grammatically simpler in that they do not require a possessive suffix as the other nominalizing suffixes do. Children mostly use the desire verb *iste-* 'want' as their first complement structure. The fact that *-(y)AcAK* nominalizations are acquired last in both the naturalistic and the experimental data may be due to the fact that they refer to a state that is not actualized at the time of speaking. They are syntactically more complex than *-mAK* complements since they are not control structures and thus require a possessive suffix and a case suffix. It is also worth noting that *-(y)AcAK* nominalizations were infrequent in adults' speech.

The order in which *-mA* and *-DIK* nominalizations are acquired may be due to the verbs they are used with, since both of these nominalizers are grammatically of the same complexity in terms of the suffixes attached. The fact that *-DIK* is used with matrix predicates that express the speaker's epistemic attitude, that is, his/her commitment to the truth of the statement, may make it easier for children to comprehend. Since the *-DIK* suffix is also used in adverbial clauses and relative clauses, it may be easier for children to acquire it when compared with *-mA*. However, since *-DIK* clauses can be simplified, they were less frequently encountered in the mothers' and children's speech. The pragmatic function of *-DIK* nominalizations and the use of *-DIK* nominalizations in mothers' speech needs further study. It seems that complement clauses are avoided in everyday speech. The matrix predicates that are nominalized with *-mA* are mostly verbs that express a modal notion, such as command, wish or obligation. It may be the case that children hear such *-mA* clauses with the matrix predicates *lazım* 'necessary' and *gerek* 'necessary' frequently since this is the type of complement structure mothers use when regulating children's behaviour. It may also be the case that children find modal notions harder to understand.

Since the reason for most errors in Production Experiment 2 was children's choice of the wrong nominalizing suffix with the matrix predicate, it can be argued that children learn verbs by the complementizers they take, as suggested in Taylan (1998a and 1998b), Özsoy (1999) and Schaaik (1999). Acquisition of complementation in English was also reported to be verb by verb (Bloom et al. 1984).

To sum up, it seems that *-mAK* nominalizations are the first to be acquired and the first to be comprehended. *-DIK* is the second nominalizer that is acquired, followed by the *-mA* nominalizer. *-(y)AcAK* is the nominalizer that is acquired last. The reasons for the observed acquisition order have to do both with the type of matrix predicates, its semantic complexity and pragmatic function, as well as the syntactic complexity of the structure.

References

Aksu-Koç, Ayhan & Slobin, Dan I. 1985. The acquisition of Turkish. In: Slobin, Dan I. (ed.) 1985. *The crosslinguistic study of language acquisition 1: The data.* Hillsdale, NJ: Lawrence Erlbaum Associates. 839-878.

Aksu-Koç, Ayhan 1994. Development of linguistic forms in Turkish. In: Berman, R. & Slobin, Dan I. (eds.) 1994. *Relating events in narrative: a crosslinguistic developmental study.* Hillsdale, NJ: Lawrence Erlbaum Associates. 329-384.

Altan, Aslı 2005. Türkçede tümleç yantümcelerinin edinimi. In: Sarı, Mustafa & Nas, Halef (eds.) 2005. *19.ncu Ulusal Dilbilim Kurultayı. 17-20 Mayıs 2005.* Şanlıurfa: Harran Üniversitesi: 9-30.

Anderson, Elaine 2000. Exploring register knowledge: The value of "controlled improvisation". In: Menn, Lise & Ratner, Nan B. (eds.) 2000. *Methods for studying language production.* Mahwah, NJ: Lawrence Erlbaum Associates. 225-249.

Bartsch, Karen & Wellman, Henry M. 1995. *Children talk about the mind.* New York: Oxford University Press.

Bever, Thomas G. 1970. The cognitive basis for linguistic structures. In: Hayes, John R. (ed.) 1970. *Cognition and language development.* New York: Wiley & Sons, Inc.

Bloom, Lois 1991. *Language development from two to three.* New York: Cambridge University Press.

Bloom, Lois & Rispoli Matt & Gartner, Barbara & Hafitz, Jeremie 1989. Acquisition of complementation. *Journal of Child Language* 16, 101-120.

Bloom, Lois & Tackeff, Jo & Lahey, Margaret. 1984. Learning 'to' in complement constructions. *Journal of Child Language* 11, 391-406.

Chomsky, Noam 1964. Current issues in linguistic theory. In: Fodor, Jerry A. & Katz, Jerrold J. (eds.) 1964. *The structure of language: readings in the philosophy of language.* Englewood Cliffs: Prenctice Hall. 39-47.

Chomsky, Noam 1981. *Lectures on Government and Binding.* Dordrecht: Foris.

Eisenberg, Sarita & Cairns, Helen 1994. The development of infinitives from three to five. *Journal of Child Language* 21, 713-734.

Fodor, Jerry & Garrett, Merill & Bever, Thomas G. 1968. Some syntactic determinants of sentential complexity 2. Verb structure. *Perception and Psychophysics* 3, 453-461.

Hollebrandse, Bart & Delfitto, Denis & Hout, Angeliek van & Vroeg, Andréa de 2001. Italian sequence of tense: complementation or imperfectivity? In: Do, Anna H.-J. & Domínguez,

Laura & Johansen, Aimee 2001. *Proceedings of the 25th Boston University Conference on Language Development.* Somerville MA: Cascadilla Press. 343-352.

Ketrez, Nihan 1999. Early verbs and the acquisition of the Turkish argument structure. [Unpublished M.A. thesis. Boğaziçi University.]

Kim, Young-Joo 1989. Theoretical implications of complement structure acquisition in Korean. *Journal of Child Language* 16, 543-598.

Kornfilt 1984. *Case marking, agreement, and empty categories in Turkish.* Ph.D. thesis, Harvard University.

Kural, Murat 1994. Yantümcelerde çekim ekleri. *Dilbilim Araştırmaları*, 80-111.

Limber, John 1973. The genesis of complex sentences. In: Moore, Timothy E. (ed.) 1973. *Cognitive development and the acquisition of language.* New York: Academic Press. 169-186.

Lust, Barbara & Flynn, Suzanne & Foley, Claire 1996. What children know about what they say: elicited imitation as a research method for assessing children's syntax. In: McDaniel, Dana & McKee, Cecile & Cairns, Helen Smith (eds.) 1996. *Methods for assessing children's syntax.* Cambridge, MA: MIT Press. 55-77.

Özsoy, Sumru A. 1988. On complementation in Turkish: Possessed impersonal infinitives. In: Koç, Sabri (ed.) 1988. *Studies in Turkish linguistics.* Ankara: METU. 299-310.

Özsoy, Sumru A. 1999. *Türkçe.* Boğaziçi Üniversitesi Yayınları: İstanbul.

Pérez-Leroux, Ana Teresa 2001. *Children's acquisition of irrealis complement clauses in Spanish.* In: Almgren, Margareta & Barreña, Andoni & Ezeizabarrena, María-José & Idiazabal, Itziar & MacWhinney, Brian (eds.) 2001. *Research on child language acquisition: Proceedings of the 8th Conference of the International Association for the Study of Child Language.* Somerville MA: Cascadilla Press. 1046-1054.

Pinker, Steven 1984. *Language learnability and language development.* Cambridge, MA: MIT Press.

Roeper, Tom & deVilliers, Jill G. 1994. Lexical links in the WH-chain. Syntactic theory and first language acquisition: Cross-linguistic perspectives 2. In: Lust, Barbara & Hermon, Gabriella & Kornfilt, Jaklin (eds.) 1994. *Binding, dependencies and learnability.* Hillsdale, NJ: Erlbaum. 357-390.

Schaaik, Gerjan van 1999. The order of nominalizations in Turkish. *Turkic Languages* 3, 87-120.

Tardiff T. & Wellman, H. M. 2000. Acquisition of mental state language in Mandarin- and Cantonese-speaking children. *Developmental Psychology* 36, 25-43.

Taylan, Eser 1998a. What determines the choice of nominalizer in Turkish nominalized complement clauses. In: Caron, Bernard (ed.) 1998. *Proceedings of the 18th International Congress of Linguistics.* Oxford: Pergamon.

Taylan, Eser 1998b. Türkçe'de tümce yapısına sahip tümleç yantümceleri. In: İmer, Kamile & Uzun, Leyla Subaşı (eds.) *Doğan Aksan armağanı.* Ankara: Ankara Üniversitesi Yayınları. 154-164.

Thornton, Robert 1996. Elicited production. In: McDaniel, Dana & McKee, Cecile & Cairns, Helen Smith (eds.) *Methods for assessing children's syntax.* Cambridge, MA: MIT press. 77-103.

Tosun, Gülşat 1999. Embedded clauses in Turkish: extraction possibilities. [Paper presented at the Ford Foundation Fall Syntax Workshop at Harvard University].

Underhill, Robert 1976. *Turkish grammar.* Cambridge, MA: MIT press.