THE ACQUISITION AND USE OF RELATIVE CLAUSES IN TURKIC AND INDO-EUROPEAN LANGUAGES

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Current crosslinguistic study of child language development indicates that languages do not differ greatly in terms of ease of acquisition. However, for any particular type of language, some systems of the grammar are easier to acquire than others. A similar statement could be made in comparative psycholinguistics: Overall, languages do not seem to differ greatly in terms of ease of processing; however, for any particular type of language, some systems of the grammar are easier to process than others. These two psycholinguistic generalizations have implications for language change: Those parts of a language that are most stable over time should be acquired relatively early in the course of development and should be relatively easy to process. Conversely, the parts of the grammar most susceptible to change — either through internal change or under the influence of borrowing from other languages — should be those parts which are acquired late and which are relatively difficult to process.

These principles are of course, not new. What is new is the fact that we now have crosslinguistic data — for the same linguistic domain — from child language, adult speech, and comparative history within a language family. The domain is relative clause, and the language family is Turkic. The contrasting group of languages is Indo-European.

The only Turkic language for which we have data on acquisition is Turkish (Aksu-Koç & Slobin, 1985); for Indo-European, all of the major languages of Europe have been studied in some detail developmentally (see papers in Slobin, 1985). To begin with the most general statement: The means for expressing case relations are acquired rapidly and without error by Turkish children. Before the age of 2, the entire system of agglutinative morphology on nominals has been mastered. On the other hand, the means for subordination and complementation are not easily acquired at all, and 5-
year-olds are still sorting out the various participial and nominalized forms for clause and sentence embedding.

Briefly, Turkish is characterized by strings of suffixes, with each suffixed particle retaining its phonological and semantic identity as well as its relative position in the string, allowing for transparent and cumulative expression of elements of meaning. For example, consider the order of noun suffixes: stem + (plural) + (possessive) + (case), as in el ‘hand’, -ler ‘plural’, -im ‘first person possessive’, -de ‘locative’. The following combinations are possible:

\[
\begin{align*}
el & \quad \text{‘hand’} \\
- \text{im} & \quad \text{‘my hand’} \\
el & \quad \text{‘in hand’} \\
- \text{im-de} & \quad \text{‘in my hand’}
\end{align*}
\]

\[
\begin{align*}
el & \quad \text{‘hand’} \\
- \text{ler} & \quad \text{‘hands’} \\
el & \quad \text{‘in hands’} \\
- \text{ler-de} & \quad \text{‘in hands’}
\end{align*}
\]

There is no irregularity, and there are no confusions of meaning typical of Indo-European morphemes which combine, for example, case, number, and gender in a single surface form. In inflectional morphology, the Turkic languages adhere closely to one-to-one mappings between elements of form and elements of content, in contrast to typical Indo-European expressions.

In clausal embedding, however, the situation is reversed. Looking at relative clauses, for example, we find clearly separated surface clauses in Indo-European languages, whereas the corresponding clauses in Turkish are condensed into deverbal particles of various sorts. Consider the following two types of relative clauses, which will play a major role in the discussion to come. In the first example the coreferential noun, ‘man’, serves as subject in the relative clause, and is marked by a special nominal particle, -En, referred to hereafter as SR (subject relative):

(1) \[gel \quad -en \quad \text{adam}
\quad \text{come} \quad \text{SR} \quad \text{man}
\quad \text{‘the man who came’}\]

Note that whereas English, like other Indo-European languages, retains a finite verb (came) and a subject pronoun (who), Turkish has a nonfinite verb with a nominal particle. The same contrast appears in nonsubject relatives (NSR), which are marked by a different nominal particle in Turkish, -dlk. Note that in such constructions the subject of the embedded clause appears in the genitive, as the possessor of the nominalized verb:

(2) \[\text{Ali} \quad -\text{nin} \quad \text{gör} \quad -\text{du} \quad -\text{ü} \quad \text{adam}
\quad \text{Ali} \quad \text{GEN} \quad \text{see} \quad \text{NSR} \quad \text{POSS:3SG} \quad \text{man}
\quad \text{‘the man whom/that Ali saw’}\]

Again, English has a finite verb and a relative pronoun (with relevant casemarking if whom is chosen). The NSR form is broader than an object relativizer, since, depending on the meaning of the verb, oblique cases can be indicated as well; e.g.:

(3) \[\text{Ali} \quad -\text{nin} \quad \text{otur} \quad -\text{du} \quad -\text{ü} \quad \text{ev}
\quad \text{Ali} \quad \text{GEN} \quad \text{dwell} \quad \text{NSR} \quad \text{POSS:3SG} \quad \text{house}
\quad \text{‘the house in which Ali lives’}\]

To state the contrast between the two language types most simply: Turkic languages adhere to one-to-one mappings in inflectional morphology but not in clausal embedding, while Indo-European languages present the opposite pattern. As a consequence, in Indo-European acquisition, overall, the picture is quite different. The means of expressing case relations vary, of course, from the word-order system of English to the mixed word-order and inflectional systems of languages like Russian or German. The Romance languages have special systems of clitic pronouns for expressing certain case relations. And so on. However, whatever the language, the full means for expressing case relations are never mastered in an Indo-European language by age 2, as they are in Turkish. On the other hand, it is relatively easy for Indo-European-speaking children to acquire such particles as subordinating conjunctions, relative pronouns, and the like, which are used to embed clauses within larger constructions. Such particles clearly mark clause boundaries and functions of coreferential elements, and the clauses themselves retain many features of nonembedded clauses.

As a case study in comparative psycholinguistics we will examine the development and use of relative clauses in Turkish and English. However, before turning to detailed data, let us consider this gross comparison between Turkic and Indo-European child language in the light of another gross comparison between the histories of the two language families within a comparable time period. Our time depth for Turkic goes back to the Orhon inscriptions of the eighth century (cf. Tekin, 1968). Already in those inscriptions — and ever since, in all of the Turkic languages — the agglutinative morphology is established and stable. And already in the inscriptions one finds the non-Turkish use of question words to introduce subordinate clauses, presumably under foreign influence (cf. Gabain, 1950:189). Throughout the history of the Turkic languages, subordinating particles are repeatedly borrowed from neighboring languages or invented on neighboring models, and verb forms constantly shift between participles and tense forms (cf. Abdullayev, 1963; Abduraxmanov, 1967; Comrie, 1981; Gadžieva, 1961, 1973; Serebrennikov
between these two languages in their use of relative clauses.

Figure 1 shows an additional developmental fact of importance: not only are relative clauses used more frequently by English-speaking children overall, but their development shows a much more accelerated growth curve, with a major spurt by around age 3-and-a-half. The mastery of relative clauses in Turkish must take place later than 4;8 — the oldest age in our sample.

We don’t have child language data from other Turkic languages, but there is ample evidence from the acquisition of other Indo-European languages that the English picture is quite normal. In languages as diverse as French (Clark, 1985) and Russian (Gvozdev, 1949), for example, relative clauses begin to be used by about age 2-and-a-half to 3, and show rapid development thereafter.

I would like to suggest that the differences reflected in Table 1 and Figure 1 are based on some quite general psycholinguistic processing principles. Turkish relative clauses present two major types of processing problems: they don’t look like clauses and they are not constructed in a uniform way across different types of relativization. I propose to consider each of these problems in the light of (1) child and adult speech data, (2) crosslinguistic comparison among various Turkic languages, and (3) historical evidence. My basic argument will be that languages strive — as much as possible — toward one-to-one mapping between surface forms and underlying meanings. One reason the Turkish case inflectional system is so easily mastered, for example, is because it adheres closely to such a criterion of transparency. By contrast, Turkic relative clause constructions are highly nontransparent and therefore are reformulated in history, replaced by paraphrases in conversation, and acquired with difficulty.

Isolability of Clauses

First let us consider the problems of isolating a relative clause while listening to speech and producing a relative clause while speaking. Indo-European relative clauses bear the surface form of clauses, with finite verbs and generally with a relative pronoun indicating the role of the coreferential noun in the subordinate clause. There is a good deal of evidence from psycholinguistic experiments indicating that relative pronouns facilitate sentence parsing in speech perception. There is also a good deal of evidence that the listener filters and segments speech according to schemas based on standard or “canonical” clausal patterns in the language (Fodor, Bever, & Garrett, 1974).
Consider, for example, the following Turkish utterances from our sample of adult speech to children, and their English equivalents:

(4) Bizim ev -in önün -e gel -en kedi -ye
our house GEN front DAT come SR cat -DAT benziyor.
resembles
‘It looks like the cat that comes to the front of our house.’

(5) Kazan -düğ -in para -yla ne yap -acan?
earn NSR POSS:2SG money with what do FUT:2SG
‘What will you do with the money (that) you earn?’

The Turkish sentences have nonfinite verbs in the form of nominalizations or participles, as discussed above. (We will return to the problems presented by the existence of the two participial forms.) In the first example, subject-verb order is reversed: gelen kedi (come+SR cat ‘cat that comes’) as opposed to kedi geliyor (cat come+PRES ‘cat comes’). The English subject relative is maximally transparent: the cat that comes, corresponding to an underlying construction, the cat comes. The second example, an object relative, condenses subject and transitive verb into a single word in Turkish, the possessed nominalization kazandıdın, in comparison with the full you earn in English. Psycholinguistic experiments on English sentence processing have shown that the sequence NOUN-that-NOUN-VERB is subject to a strategy of interpretation corresponding to object-subject-verb (Fodor & Garrett, 1967).

I am not suggesting that corresponding sentence interpretation strategies do not exist in Turkish. Clearly, Turkish speakers do use relative clauses, and they must be processible. Rather, I am suggesting that the types of strategies required in Turkish are more demanding than those strategies first attempted by children. In my crosslinguistic work on universals of acquisition (Slobin, 1973, 1985), I have formulated a number of learning principles that I call “operating principles” for acquisition. They are derived from examining data on the course of acquisition of many different types of languages. These principles are presumably part of the basic set of skills that the child applies to the task of arriving at a grammar of his or her native language. Two of these principles are especially relevant to the present argument. They are phrased as instructions to the “language acquisition device”:

(6) Operating Principle in Regard to Analytic Forms: If a semantic configuration can be expressed by a single, unitary form (synthetic expression) or by a combination of several separate forms (analytic expression), prefer the analytic expression.

(7) Operating Principle in Regard to Canonical Forms: If a clause has to be reduced, rearranged, or otherwise deformed when not functioning as a canonical main clause (active, declarative, affirmative clause with full noun arguments and finite verb), attempt to use or approximate the full or canonical form of the clause.

It is evident that English relative clauses are more accessible to these two operating principles than are the corresponding Turkish expressions. The English forms are analytic and they approximate the canonical form of an English clause. By contrast, the Turkish forms are synthetic and noncanonical.

In avoiding relative clauses, Turkish children have recourse to paraphrases which are more analytic and canonical in form. The child transcripts are full of such elaborated equivalents of relative clauses, bracketed by the particles hani and ya. These difficult-to-translate discourse particles, meaning something like ‘well’, or ‘after all’, or ‘you know’ are used in adult speech to emphasize or remind the listener of an item of shared information or common knowledge. It is of interest that their early use as relative clause substitutes is found in contexts of appeals to shared knowledge to identify reffereents, as in the following examples:

(8) ADULT: O odada yatak var mı?
‘Is there a bed in that room?’

CHILD (3;8): Var. Hani sizin evde büyük yatağınız var ya, onun gibi.
‘There is. HANI there’s a big bed in your house YA — it’s like that one.’

RELATIVE CLAUSE EQUIVALENT:

(9) CHILD (4;0): [wanting to play with a toy house that has a removable roof]
O evlen oynuyaçağız mı? O evlen?
‘Will we play with that house? With that house?’
ADULT: Hangi evlen?
‘With which house?’

CHILD: Hani ev var ya böyle dami.
‘HANI there’s a house YA — (with) a roof like that.’

RELATIVE CLAUSE EQUIVALENT:
dam i ol -an ev
roof be SR house
‘a house that has a roof’

Such forms with hani and ya are extremely frequent. They are possible in
adult Turkish as well, suggesting that the need for paraphrase of relative
clauses is not just a problem for children. For example, Banguoğlu, in his
Turkish grammar (1974:554), characterizes such forms as konuşma dili (‘conversational language’). They occur in the adult speech to children in our
transcripts as well, generally as memory prompts. For example:

(10) MOTHER: Bak, çocuklar oraya gelince ne yapacağız çocuğum?
Bağıracağız, değil mi? Suyu ellemesinler diye.
‘Look, when children come there, what do we do, my
child? We shout, don’t we? So that they won’t touch
the water.’

CHILD (3;4) Hangi suyu?
‘Which water?’

MOTHER: Hani bize pompayla su verecekler ya, hatırlıyor
musun? Çocuklar gelince sen pencereye çıkıp onları
döveceksin, değil mi?
‘HANI they give us water with a pump YA, do you
remember? When children come you’ll go to the win-
dow and hit them, won’t you?’

In other Turkic languages, especially under the influence of neighboring
Indo-European languages, such forms have often become grammaticized as
means of subordination. The equivalent of hani plays such a role in Gagauz,
a Turkic language of Moldavia, heavily influenced by Romanian and Russian
(Baskakov, 1966; Dmitriev, 1962; Gajdarzı, 1981; example from Pokrov-
skaia, 1966:136):

(11) götüreýim o adam -a, ani ev -i sattı
I’ll-take that man DAT REL house ACC sold

bana
to-me
‘I’ll take it to that man who sold me the house.’

TURKISH RELATIVE CLAUSE EQUIVALENT:
bana ev -i sat -an adam
to-me house ACC sell SR man
‘the man who sold the house to me’

As pointed out above, interrogative pronouns were used as subordinat-
ing conjunctions in Old Turkic, first under Mongol influence, and then
strengthened by Iranian influence. It is clear from the following eleventh cen-
tury example from the Kutadgu Bilik (Abduraxmanov, 1967:146) that kim
‘who’ had become grammaticized as a subordinating particle, losing its inter-
rogative force and its animacy:

(12) bu söz kim sen aydın
this word that you said
TURKISH RELATIVE CLAUSE EQUIVALENT:
sen -in de -diğ -in söz
you GEN say NSR POSS:2SG word

Azeri (Azerbaijani Turkish), under Persian influence, has used ki ‘that’
as a subordinator since at least the fourteenth century (Gadžieva, 1973:354).
Ki is used to relativize on subject, object, and oblique cases, as shown in the
following example from Soviet Azerbaijan (Gadžieva, 1961:178):

(13) bu otaglar ki men yaşıyram
this rooms that I live
‘these rooms that I live in’
TURKISH RELATIVE CLAUSE EQUIVALENT:
ben -im otur -duğ -um odalar
I GEN live NSR POSS:1SG rooms

The modern Turkic languages of the Soviet Union have made extensive
use of relative pronouns modeled on Russian. Indeed, it is a frequently
repeated goal of Soviet Turkologists to “perfect” or “normalize” the gram-
mar of Turkic languages by increasing the use of such Indo-European means
of subordination (e.g. Baskakov, 1980). In Comrie’s recent survey of the lan-
guages of the Soviet Union he notes (1981:85):

Especially in the less widely spoken Altaic languages of the USSR... which
have developed as written languages under strong Russian influence, there
Such strange and complex sentences can be interpreted by some English-speaking children of that age (de Villiers et al., 1979; Sheldon, 1974). However, none of our Turkish children could fully interpret any of these sentences. Instead, what they did was to act out the portions of the sentences indicated in capitals — that is, those portions corresponding to canonical SOV sentences, apparently ignoring the -An and -dIk participles as uninterpretable verbs. So the first problem is simply to identify these nonfinite forms as verbs with their appropriate valences and participants in complex sentences.

However, not only are such forms nontransparent, but they bear within them several different kinds of information. One must distinguish whether the relativized noun functions as subject in the subordinate clause (-An = SR) or whether it performs any one of a number of other functions (-dIk = NSR). Overlaid on this distinction, at least for adults, is the distinction between specificity of reference, which can result in the use of -An to relativize the object in a sentence that has an indefinite subject (Knecht, 1979). Furthermore, many of the subject relatives in our samples — both for children and adults — are not marked by -An, but by another form, the locative relativizer -dAki, since a major function of relative clauses in discourse is to locate referents spatially. For example:

(15) ev de ki çocuk
house LOC PRT child
‘the child (who is) in the house’

The Turkish child is thus presented with an array of forms corresponding to the simple that relative pronoun of English. There are several interesting results of this problem in child speech.

Table 1 shows that Turkish children hardly ever use -dIk forms: 12% overall. The nonsubject relatives are also less frequent in speech to children: 32% in speech to children, 37% in conversation between adults. One thinks first of the Keenan-Cromie (1977) accessibility hierarchy, which presents subjects as most accessible to relativization:

SU > DO > IO > OBL > GEN > OCOMP³

While there may be psycholinguistic reasons favoring relativization of subjects, however, this is not the full story, as shown by our English data. Table 1 shows that, overall, 56% of child relative clauses are on nonsubjects, and this trend is present from the youngest age group onward. In English adult conversation 58% of relative clauses are on nonsubjects. So, if a language
provides equivalent means for relativizing on various positions of the accessibility hierarchy, the advantage to subject relativization is not demonstrated. Table 2 shows that English speakers can even relativize on oblique cases fairly frequently, though this is exceptionally rare in Turkish. An additional factor must lie in the complexity of the Turkish -dlk construction.

Note that this construction obscures the underlying form of the subordinate clause in two ways: the verb is nonfinite, and it is a nominalization possessed by the agent, which is marked in the genitive rather than the nominative case. It is thus quite distant from the canonical clause form of Turkish. The Turkish comprehension data show that children are reluctant to interpret a sentence-initial noun in the genitive as an agent. Note that they skip over the first noun, lamanın, in sentences like (14c), picking the first nominative noun as agent. Similar errors occur in speech when they finally begin to produce complex constructions. For example, a 5-year-old in Aksu’s dissertation research failed to mark the subject of an embedded complement clause in the genitive, using the nominative instead (ešek ‘donkey:NOM’, instead of ešeğin ‘donkey-GEN’):

(16) çünkü ešek kaç -tğ -in -i
because donkey run-away NSR POSS:3SG ACC
gördü -tğ -ü için
saw NSR POSS:3SG for
‘because he saw the donkey run away’

We have suggestive experimental evidence that Turkish adults, as well, find it easier to process complex sentences beginning with nouns in the nominative, and easier to process -An than -dlk constructions. Doğan Cicekcuğ and I asked 28 students at Hacettepe University in Ankara to rate groups of four sentences such as the following in terms of difficulty. (See Fodor, Bever, & Garret, 1974:357, for a discussion of the psycholinguistic generality of this technique.) There was remarkably significant agreement between students in rating sentences in the following order (mean ranks in parentheses; concordance of rankings statistically significant with p < .01):

professor student+ACC like SR director+ACC saw
‘The professor saw the director whom the student liked.’
(Rank = 2.0)

b. Profesor talebenin sev -diğ -i mûdûrû
professor student+GEN like OR POSS director+ACC

gördü.
saw
‘The professor saw the director whom the student liked.’
(Rank = 2.4)

c. Talebei sev -en profesör mûdûrû gördü.
student+ACC like SR professor director+ACC saw
‘The professor who liked the student saw the director.’
(Rank = 2.7)

d. Talebenin sev -diğ -i profesör mûdûrû
student+GEN like OR POSS professor director+ACC
saw
‘The professor whom the student liked saw the director.’
(Rank = 2.9)

Note first that the two sentences beginning with uninflected nouns, (17a) and (17b), are rated as easier to comprehend than the two sentences beginning with inflected nouns (17c) and (17d). Note also that for the two pairs of constructions, (17ab) and (17cd), it is the -An form that is rated easier than the -dlk (OR = object relative) form. Overall, there are two significant main effects (Wilcoxon Matched-Pairs Ranked-Sign Test): -An vs. -dlk, with -An easier (p < .05); and embedded vs. nonembedded, with embedded easier (p < .01).

These findings raise a puzzling question in regard to earlier arguments in the literature about the difficulties of embedded constructions vs. leftbranching constructions in languages like Turkish and Japanese, such as the arguments presented by Kuno (1972) and by Antinucci, Duranti, and Gebert (1979). It is important to bear in mind that psycholinguistic explanations of the difficulty of relative clauses have mainly been based on the problems presented to the listener. These arguments may indeed be relevant to small children, who have not yet deciphered the range of means for signaling clause types and clause boundaries on the surface. Furthermore, the on-line parsing mechanisms developed for English may not be universally valid. It is more likely that such mechanisms are constructed ontogetenically in accordance with the types of information array characteristic of the input language. Verbal-final languages like Turkish require the listener to hold information until encountering clause-final verbs or postpositions. Sentence-processing heuristics proposed for verb-medial, prepositional languages like English are hardly feasible for such languages.
However, whatever the typological constraints on sentence-processing heuristics may be, Turkish would seem to be quite admirably equipped with perceptual cues for relative-clause processing. The cues to noncanonical interpretation provided by nonfinite verbs and case inflections, once mastered, should significantly aid processing. Rather, I would propose, the burden of processing a language like Turkish lies more on the speaker than the listener. It is the speaker who must, “on line,” quickly choose the appropriate means to signal subject or nonsubject relativization, specific or nonspecific reference, and mark the participants with the appropriate case inflections. It may well be that these several choices present a burden to the production system.

The evidence in support of this suggestion is inferential, and comes from several directions. When Turkish children begin to use subordinate constructions, they have difficulty with casemarking, as pointed out earlier. They also have difficulty in choosing the appropriate nonfinite verb form, as shown in the following errors from Aksu’s dissertation research in which 3-year-olds were asked to describe pictures:

(19) TURKMEN:

\[
gel\_en\_adam\]

\text{come PRT man}

‘the man who came’

TURKMEN EQUIVALENT: same

TURKMEN:

\[
menin\_yaz\_\_an\_kitabum\]

\text{my write PRT my-book}

‘the book that I wrote’

TURKMEN EQUIVALENT:

\[
benim\_yaz\_\_di\_\_im\_kitap\]

\text{my write NSR POSS:1SG book}

TURKMEN:

\[
menin\_gid\_\_en\_yolm\]

\text{my go PRT my-road}

‘the road that I go on’

TURKMEN EQUIVALENT:

\[
benim\_git\_\_ti\_\_im\_yol\]

\text{my go NSR POSS:1SG road}

AZERI:

\[
sen\_istey\_\_en\_\_sey\]

\text{you want PRT thing}

‘the thing that you want’

TURKMEN EQUIVALENT:

\[
senin\_iste\_\_di\_\_in\_\_sey\]

\text{your want NSR POSS:2SG thing}

These forms are consistent with what we have seen of processing difficulty associated with the -dlik construction; and they are also consistent with the Keenan-Comrie accessibility hierarchy, in that the form highest on the hierarchy takes on the functions of lower forms.

Finally, it is of interest to observe what happens to the various participial forms in Turkic languages. First, consider Turkish. In (18) we saw that children have difficulty distinguishing the functions of various nonfinite verb forms. In addition, they often use adjectival or adjective-like forms with the suffixes -\_ik, -\_ill, and -\_ml\_s. Table 2 shows that the subject relatives occurring in Turkish speech, both of children and adults, include frequent use of -\_d\_aki forms along with -\_An. These forms are perhaps most transparent, in that they simply add a -\_ki particle to an evident locative. This whole collection of pre-
nominal forms serve with great frequency as stative adjectives. The present quality of an object can be characterized as the result of a past action. The past action can be alternately looked upon as an action, a resultant state, or a substantivized entity. In the history of the Turkic languages the forms we have been considering, along with others, do not seem to stay put for any one of these closely related perspectives on events. For example, -An has become a past tense term in Uzbek, presumably because gelen adam, the man who has come, is, by necessity, also adam ki geldi, the man who came. In Old Turkic we see movement of -dlk from a simple past tense to a nominal form; we see development of -dl as a simple past, followed by the movement of -mls from a passive participle to an evidential-inferential past. In Uzbek, the verb -ip becomes an inferential past. And so on.

In sum, we see three main historical trends in the Turkic languages, supported by contemporary psycholinguistic evidence from the development and use of Turkish: (1) Parts of the grammar provide a stable bedrock, defining and maintaining the basic typological characteristics of the language family: postposed nominal and verbal inflections, postpositions, verb-final constructions. When parts of these systems erode, they are replaced intact. For example, new postpositions are formed out of separate words or particles and are eventually agglutinated in their proper positions. (2) Parts of the grammar are open to foreign influences, especially the large collection of conjoining and subordinating particles borrowed or copied from Arabic, Iranian, and Slavic. (3) Parts of the grammar are constantly reformulating themselves within an interacting sphere of concepts: movement between forms marking resultant state, past tense, inference, temporal relations, and substantivization of states and actions.

As a result of the stable core of agglutinative morphology, and the flexibility of use of various forms in discourse, the Turkic languages have maintained their basic typological consistency across a wide range of potentially disturbing outside influences. However, these influences have simply contributed to enriching the means of expression available to Turkic speakers. To fully understand these events we need to know much more about the roles of syntactic forms in ongoing discourse, and the processing loads carried by both speaker and listener. Ultimately, however, this entire range of phenomena should be explainable by a universal set of psycholinguistic principles.

NOTES

1) Vowel harmony adjusts suffixes according to the last vowel of the preceding stem, following one of two main alternations; (1) a front-back alternation of unrounded low vowels, ela, represented here by the morphophonemic unit E, and (2) a front-rounded-_cleanup-309589a2327295b5c7a74986da5c2038-2021-12-27-16-17-6.png

2) The Berkeley Crosslinguistic Acquisition Project was carried out with support from the William T. Grant Foundation to the Institute of Human Learning and from NIMH to the Language Behavior Research Laboratory, University of California, Berkeley. Computer facilities in the Berkeley Child Language Archive have been provided by the Sloan Foundation and NSF, allowing for continuing analysis of Turkish speech data. Ayhan Aksu-Koç, Francesco Antinucci, Thomas G. Bever, Eve V. Clark, Herbert H. Clark, Susan Ervin-Tripp, Judith R. Johnston, and Ljubica Radulović collaborated with Dan I. Slobin in designing the investigation. Ayla Algar and Alev Alath served as testers in Istanbul and Ankara. Aksu’s dissertation research received partial support from the American Research Institute in Turkey. Doğan Çiçekli collaborated in gathering linguistic judgment data from students at Hacettepe University, Ankara. Adult English conversational texts were generously provided by John Gumperz and Wallace Chafe. Turkish conversational texts were gathered and analyzed with the help of Tuvana Biktimir, Güliz Kuruğlu-Benedict, İskender Savag, and Karl Zimmer. Thanks are extended to all of these institutions and individuals for their assistance in contributing to the data summarized here. Special thanks to Jane Edwards for creating “user-friendly” means of dealing with these data by computer and for her aid in statistical analyses. Thanks to Laurie Wagner for preparing the tables and figure.


REFERENCES


THE ACQUISITION AND USE OF RELATIVE CLAUSES

### Table 1.
RELATIVE CLAUSE PRODUCTION

<table>
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<th>Adult Speech</th>
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<td>2-yr.</td>
<td>3-yr.</td>
<td>4-yr.</td>
<td>all children</td>
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<td>19 90%</td>
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<td>6 6%</td>
<td>16 39%</td>
<td>20 33%</td>
<td>42 44%</td>
</tr>
<tr>
<td><strong>ENGLISH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>subject</td>
<td>5 45%</td>
<td>15 39%</td>
<td>22 47%</td>
<td>42 44%</td>
</tr>
<tr>
<td>nonsubject</td>
<td>6 55%</td>
<td>23 61%</td>
<td>25 53%</td>
<td>54 56%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>11 55%</td>
<td>38 61%</td>
<td>47 53%</td>
<td>96 56%</td>
</tr>
</tbody>
</table>

*Child samples based on c. one hour of interaction between female experimenter and child; 19 children in each group; ages 2;3-5:0 (2-yr.), 3;3-6:8 (3-yr.), 4;0-4:8 (4-yr.). Adult ← child data represent all adult speech in the 57 child samples. Adult ← adult speech drawn from 1,975 lines of two- and three-party conversation transcripts (c. 2½ hours) between acquaintances and friends on everyday topics (personal life, politics, brief narratives of past experience, etc.).

*Subject* indicates clauses in which the head noun of the main clause functions as subject in the subordinate clause (-An and -dAki in Turkish); "nonsubject" includes direct object, indirect object, and oblique cases (-dlik in Turkish).
In the TYPOLOGICAL STUDIES IN LANGUAGE (TSL) series the following volumes have been published thus far, and will be published during 1987:

8. SLOBIN, Dan I. & Karl ZIMMER (eds.): STUDIES IN TURKISH LINGUISTICS. Amsterdam, 1986.