

**The Bilingual Extended Critical Period**  
**Hypothesis: L1 vs L2 Transfer Effects in English**  
**L3 acquisition by Turkish-Dutch Bilinguals**

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## 1. Introduction

One of the major questions in language acquisition research is whether first language (L1), second language (L2) and third language (L3) acquisition develop in the same or different ways. Early L2 acquisition research (e.g. Dulay and Burt 1974; Bailey et al. 1974; Hakuta 1976; Felix 1976; Ioup and Krouse 1977; Schumann 1978; Clahsen et al. 1983; Bley-Vroman, Felix & Ioup 1988) investigated the possible structural similarities and differences produced by native speakers and L2 learners. The researchers compared the (grammaticality) judgments of adult L2 learners of English with the (grammaticality) judgments of adult native speakers of English. Analyses indicated that in certain domains the judgments of L2 learners showed structural properties similar to the speech of young children; however, there also seemed to be significant differences. One of the important differences is generally that the L2 learner's acquisition is significantly influenced by L1 knowledge. The consequences of the influence of L1 knowledge show that there are developmental errors in L2 which almost never occur in L1 acquisition (cf. Wode 1977, Kellerman 1979, Zobl 1980, Meisel 1983). The reason for this is that L1 transfer effects are present in the initial and inter-language grammar state of the L2 learner. Some researchers claim that there is full transfer of L1. This L1 transfer forms initially a basis for the subsequent language to be learned. At this point the L2 learner will not have received sufficient L2 input to represent an L2 grammar and consequently will make use of his L1 to form sentences. During this process, there will be properties transferred from the L1 into the L2 which are not found in the L2 grammar. The learner, then, may or may not reconstruct his L2 grammar. Proponents of this are researchers like Schwartz & Sprouse (1994). They support the L1 transfer by their *Full Transfer/ Full Access* theory. Schwartz & Sprouse (1994) claim that initially (and only initially) the L2 learner relies almost entirely on transfer from L1 and later (but only later)

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starts accessing Universal Grammar (UG) for natural learning of the subtleties. Other researchers like Vainikka & Young-Scholten (1994) claim in their *Minimal Trees* hypothesis that in the initial stage of L2 acquisition only transfer of L1 lexical categories (e.g. N (chair), V (eat), A (big), P (from)) takes place and at later stages of L2 acquisition the transfer of functional categories like the T category (which includes for example the 3<sup>rd</sup> person singular ‘-s’ or the past tense ‘-ed’) takes place. However, there have been many critiques on their hypothesis. That only a part of the L1 is initially transferred is not accepted by supporters of the *Full Transfer* hypothesis, for example, the claim that UG remains fully accessible in L2 acquisition could be supported by “L2 knowledge of poverty-of-the-stimulus” argument (Rothman et al. 2011). The poverty-of-the-stimulus argument is the argument that the (child) learner comes to know constraints (such as subjacency), which are not directly visible in the stimulus because they are constraints. These are not taught in L2 acquisition and are not transferred from the L1, therefore, it is highly possible that UG or other ‘language device’ plays a role in such cases.

In the case of L3 acquisition several additional hypotheses have been put forward. For L3 learners, some studies have asserted that the ‘L2 status factor’ (i.e. the prevalence of L2 transfer over L1 transfer) has lexical influence (Ecke 2001, Hammaberg 2001, Na Ranong 2009) and also syntactical influence in the acquisition of a third language (Williams & Hammarberg 1998, Leung 2005, Bardel & Falk 2007, Falk & Bardel 2011). According to Falk and Bardel (2011), “The *L2 status factor* hypothesis implies that the L2 can supersede the L1 as a source of transfer, because of a higher degree of cognitive similarity between L2 and L3, than between L1 and L3” (p. 61). Also factors like age of onset, learning strategies and learning situations seem to be more similar between L2 and L3 than between L1 and L3. For example, the difference between L1 and L2/L3 is that L2/L3 is mostly learned in an instructed environment (i.e. formal

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learning in a classroom). In the study of Bardel and Falk (2007) on the placement of sentence negation in L3 acquisition of Swedish and Dutch, the *L2 status factor* was the reason for transfer. The results showed that transfer occurred from L2 to L3.

Given this study and the studies noted above, it can be concluded that previous languages learned seem to have an impact on the learning of a subsequent language. However, there is considerable disagreement in the literature as to the effect of L2 knowledge on L3 acquisition. Some studies suggest that there is only an L1 transfer effect (Håkansson et al. 2002, Na Ranong & Leung 2009). Other studies suggest that there is L2 transfer effect either (only) positively or negatively (Bardel & Falk 2007, Rothman & Cabrelli Amaro 2010, Falk & Bardel 2011). Yet other studies suggest that there might be influence of both previous learned L1 and L2 (Flynn et al. 2004, Leung 2005). Other important factors in transfer effects are the typological language similarities or differences. According to the studies of Rothman (2011) and Montrul et al. (2011) typological proximity plays an important role in the determination of whether transfer effects come from L1 or L2. Another factor might be the extent to which the L2 is acquired. Bardel & Falk (2007) argue in their study for the qualitative differences of L2 acquisition and a subsequent L3 acquisition. These qualitative differences also exist between L1 and L2 acquisition. In this view, an interesting question might be how bilingual teenagers (simultaneous or successive) would behave in the acquisition of a third language (L3).

Research has shown a lot of advantages of bilingualism. It is assumed that having access to two languages has positive influence on the development of meta-linguistic skills (Vygotsky 1962; qtd in Yazıcı et al.2010, Cenoz, 2003), which consequently has effect on L3 acquisition. A study of Sanz (2000), which tested general language proficiency in English L3 acquisition by bilinguals, has shown that bilingualism has a positive effect on L3 acquisition. Studies in Cenoz

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(2003) also suggest that bilingualism facilitates the acquisition of a third language (L3) and it has no negative effect on L3 acquisition. Cenoz (2003) concludes that these effects can be accounted for by the fact that “bilinguals have a wider linguistic repertoire that can be used as a basis in L3 acquisition” (83). She also claims that positive transfer increases when there is an overlap of the typological features between languages.

Moreover, because of the better performance of bilinguals in L3 acquisition vis-à-vis monolinguals, one might wonder whether knowing the grammars of more than one language from a very early age extends the critical period of bilinguals for the acquisition of a subsequent language (more on Critical Period Hypothesis (CPH) in sections 3.1 and 3.2, and Bilingual Extended Critical Period Hypothesis (BECPH) see definition below and in section 3.6). However, to find evidence for the critical period of the monolinguals would be hard because of ethical limitations (for discussion section 3.1). First language acquisition takes place within the first four or five years of life cross-linguistically. During childhood this language learning capacity starts to diminish. After this period, learners seem to have difficulty learning morphosyntax and phonology, but vocabulary learning continues throughout one’s life (Herschensohn, 2007). On the other hand, there are L2 acquisition studies (Oyama 1978, Patkowski 1980, Johnson & Newport 1989, Birdsong & Molis 2001) which test the CPH on the basis of the so-called age of arrival time (AOA) of the L2 learners (for more discussion see section 3.2), which resembles the age of onset in L2 acquisition.

In this thesis, the first aim is to provide evidence for the proposed Bilingual Extended Critical Period Hypothesis (BECPH), see below.



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### The Bilingual Extended Critical Period Hypothesis

*The BECPH predicts that bilinguals who are exposed to two language grammars from very early age (approximately at age 3 or 4), and who have more experience in language learning strategies will have an extended critical period. This will result from the early extended activation of language learning mechanisms in the brain for the acquisition of a subsequent language (more on BECPH in section 3.6). As a result, bilinguals will be better than monolinguals in the acquisition of a subsequent language.*

The BECPH will be supported by comparing the data of a grammaticality judgment test (using the materials of Bley-Vroman, 1988) performed by the L1 Turkish monolingual (TM) group, L1 Dutch monolingual (DM) group, and Turkish Dutch Bilinguals (TDB) group. More specifically, the acquisition of WH-movement in English by the monolinguals and bilinguals will be compared. The WH-movement sentences include violations of Subjacency and the Empty Category Principle (ECP), which are considered to be principles of Universal Grammar (UG). The results of the ungrammatical *That*-trace effect sentences (which is a violation of the ECP in English and not in Dutch or Turkish) will particularly provide evidence for the BECPH. Since the *That*-trace effect is not found in Dutch or Turkish, L1 or L2 transfer effects cannot take place. Moreover, the students have not been taught about the *That*-trace effect. Therefore, if the Turkish-Dutch bilinguals outperform the Dutch monolinguals in the L3/L2 acquisition of English with respect to knowledge of the *That*-trace effect, this will result from an extended critical period. An explanation for this is that bilinguals have practiced two languages from a very early age, which keeps the language learning mechanism or ‘plasticity of the brain’ active longer, thereby extending the critical period. This is in a way in line with Pinker’s (1997) statement

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about the brain: “use it or lose it” during the critical period (p. 239). The second aim is to examine whether there are any L1 or L2 transfer effects in English WH-movement in L2 or L3 acquisition. For the TDBs the expectation is that there would be L2 transfer effects from Dutch to English, since it is assumed that both languages have WH-movement. This suggests that the Dutch language will facilitate learning L3 English, on the other hand, for Turkish the same cannot be inferred because Turkish is a WH-in-situ language (see Section 2.2). For the DM group positive L1 transfer effect is expected, but for the TM group negative transfer effects is expected. The TM group will accept ungrammatical WH-questions as grammatical more often than the DM and TDB groups.

The outline of this master thesis is as follows. In Section 2 the theoretical assumptions regarding WH-questions in English, Dutch and Turkish will be discussed. Section 3 reviews the theoretical assumptions regarding the critical period hypothesis and second language acquisition, as well as bilingualism and meta-linguistic awareness, and L1 versus L2 transfer effects. Section 4 presents an experimental study and the analyses of its results. Section 5 consists of the discussion about the BECPH, transfer effects of L1 to L2 and transfer effect of L1/L2 to L3. In Section 6 conclusions will be drawn.

### **2. Syntactic assumptions**

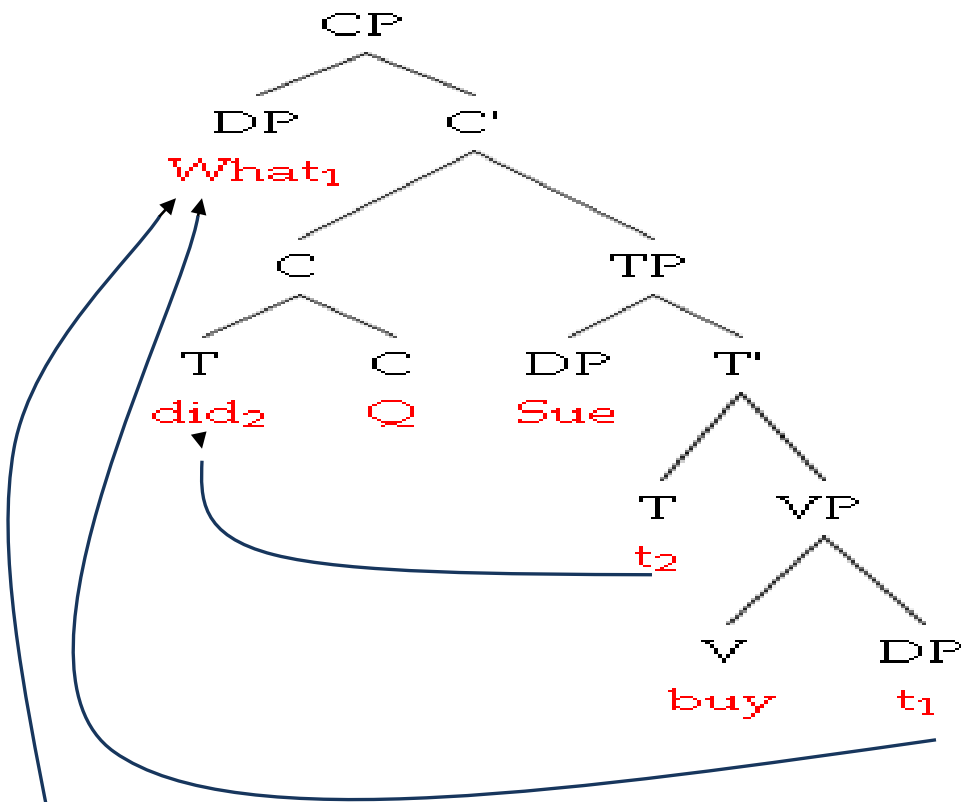
In this Chapter the syntactic properties of WH-questions in English, Dutch and Turkish that are relevant to the experimental hypotheses will be reviewed. Both English and Dutch form WH-questions by moving the WH-constituent to sentence initial position, while in the unmarked case Turkish always leaves the WH-constituent unmoved in its base-generated position. On the other hand, both Dutch and Turkish have obligatory spell out of the embedded complementizers in a 2-

clause WH-question, while English generally has optional spell out of such embedded complementizers.

## 2.1 WH-questions in English

English is a language with WH-movement. Consider the following examples (1a is depicted below, 1b).

(1) a. [<sub>CP</sub> What<sub>i</sub> did<sub>j</sub> [<sub>TP</sub> Sue t<sub>j</sub> buy t<sub>i</sub>]]?



XP (phrase) movement can only go to SPEC or complement position

b. [<sub>CP</sub> Who<sub>i</sub> [<sub>TP</sub> t<sub>i</sub> took a photograph]]?



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In English, WH-questions are formed by moving the WH-word (or phrase) to the specifier position of the matrix-clause CP, i.e. the sentence-initial CP (cf. 1a and 1b). This movement leaves a trace in the Spec-TP (tense phrase, or in older theories called IP which stands for inflectional phrase) for the subject-gap WH-word like (1b) from which it has been removed, but not for the object-gap WH-word like (1a). In the case of auxiliary verb movement, the head T in the TP moves to the head C (=COMP) in the CP and the moved element “Chomsky adjoins” to the landing site, forming a kind of compound (See 1a) (cf. Radford 141, 1997). These movements of the WH-phrase can also be applied in embedded clauses, see examples 2a and 2b below (cf. Radford 148, 1997).

(2) a. [<sub>CP</sub> Who<sub>i</sub> did<sub>j</sub> [<sub>TP</sub> he t<sub>j</sub> say [<sub>CP</sub> e [<sub>TP</sub> t<sub>i</sub> took a photograph ]]]]?

b. [<sub>CP</sub> What<sub>i</sub> did<sub>j</sub> [<sub>TP</sub> he t<sub>j</sub> say [<sub>CP</sub> e [<sub>TP</sub> Sue took t<sub>i</sub> ]]]]?

c. \*<sub>CP</sub> Who<sub>i</sub> did<sub>j</sub> [<sub>TP</sub> he t<sub>j</sub> say [<sub>CP</sub> that [<sub>TP</sub> t<sub>i</sub> took a photograph ]]]]?

d. [<sub>CP</sub> What<sub>i</sub> did<sub>j</sub> [<sub>TP</sub> he t<sub>j</sub> say [<sub>CP</sub> that [<sub>TP</sub> Sue took t<sub>i</sub> ]]]]?

However, the WH-movement in example (2a) would be ungrammatical in the presence of the overt complementizer *that* (see 2c), while in (2b) this would not be the case. The reason for this is that a subject extraction from an embedded clause is not possible in English, but an object is, therefore, (2b) has the option of a phonetically overt complementizer *that* (see 2d) and a null ( $\emptyset$ ) complementizer (see 2b). This phenomenon that it is impossible to extract a subject from an

embedded clause in the presence of *that* is called the *that*-trace effect (for more discussion on *that*-trace effect see section ECP below). It is present in English but absent in Dutch and Turkish (see sections 2.2 and 2.3). Note that the *that*-trace effect does not cause any violation in relative clauses. This is illustrated in (3).

(3) He knows the lady [<sub>CP</sub> that\_\_\_bought the villa]

In the following section *Subjacency* and *ECP* constraints on WH-movement in English will be discussed.

*Subjacency:*

The subjacency condition proposed by Chomsky (1973) is a constraint on WH-movement. It prevents WH-constituents (e.g. WH-words) from moving across more than one bounding node at a time, where IP (TP) and NP (DP) are considered to be the bounding nodes for English (Bley-Vroman 1988, Haegeman 1994)<sup>0</sup>. The subjacency violations were grouped into 3 types: WH-islands, complex NPs (Hawkins 2001 calls these DP<sub>s</sub>), and coordinate structures. The problematic situation in WH-islands is that the WH-word (or phrase) in the embedded clause has to cross more than one bounding node – which is already occupied by another WH-word (or phrase) (in example 4<sup>1</sup> (also depicted below) this is the WH-word ‘where’) – in order to land in the matrix SPEC CP<sub>1</sub> position, and this violates the subjacency principle.

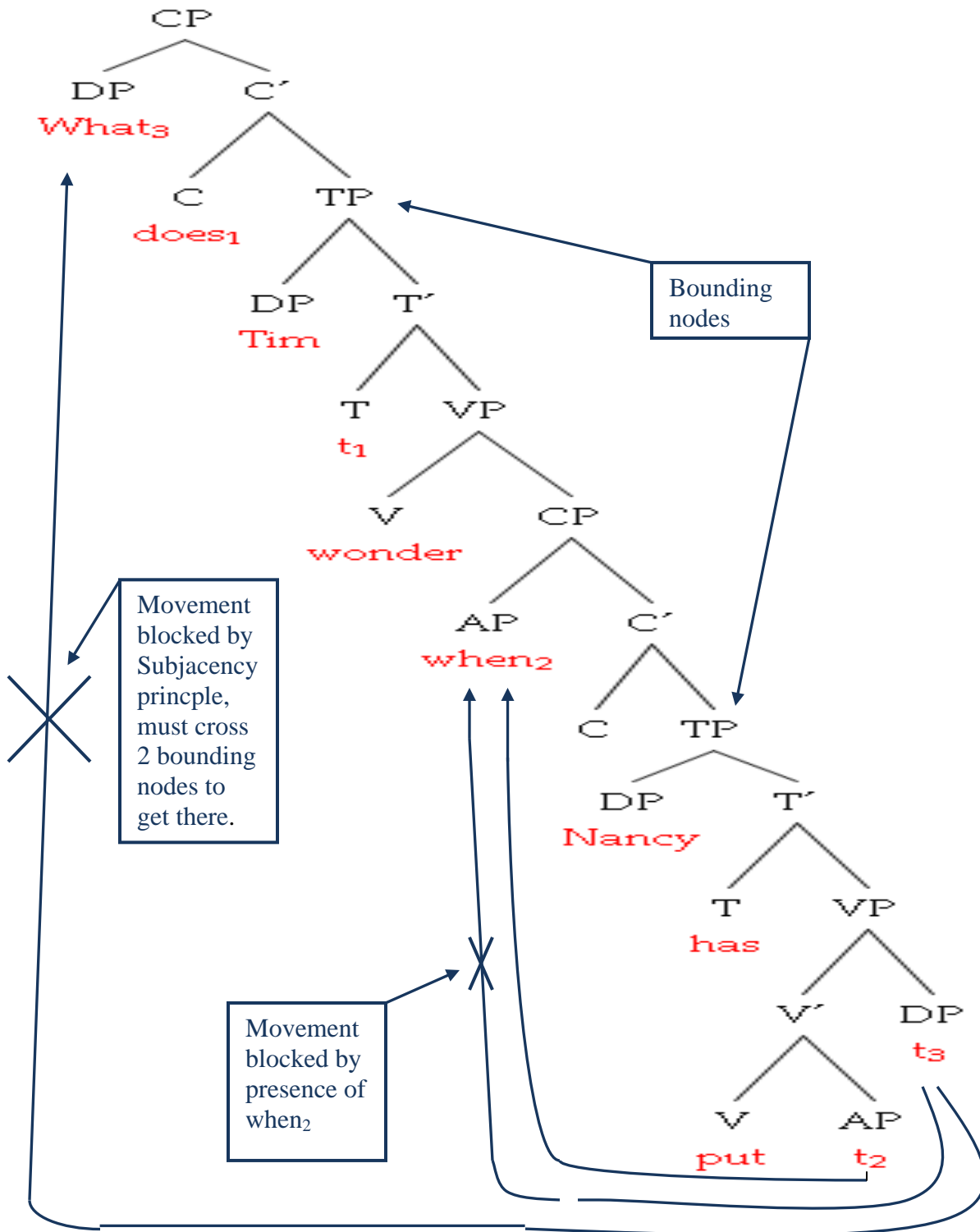
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<sup>0</sup> In the minimalist framework the Bounding Theory has been replaced by “Phrase Theory”.

<sup>1</sup> The examples given in 4 till 17( with the exception of 8) are adopted from Bley-Vroman *et al.* (1988).

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(4) \* [<sub>CP1</sub> What<sub>i</sub> does [<sub>TP</sub> Tim [<sub>VP</sub> wonder [<sub>CP2</sub> where<sub>j</sub> [<sub>TP</sub> Nancy has put t<sub>j</sub> t<sub>i</sub>]]]]]?



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The complex NPs consist of two types: factives and relative clauses. They both are problematic, since the WH-phrase in the embedded clause crosses three bounding nodes to land in the matrix SPEC CP1, that is 2 IP nodes and 1 NP node. This is illustrated in (5) for the factive and in (6) for the relative clause.

*Factive:*

(5) \* [<sub>CP1</sub> What<sub>i</sub> did [<sub>TP</sub> John hear [<sub>NP</sub> the news [<sub>CP2</sub> that [<sub>TP</sub> the mayor would do t<sub>i</sub>]]]]]?

*Relative clause:*

(6) \* [<sub>CP1</sub> Where<sub>i</sub> did [<sub>TP</sub> Bill visit [<sub>NP</sub> a friend [<sub>CP2</sub> who [<sub>TP</sub> had just arrived from t<sub>i</sub>]]]]]?

The violation of coordinate structures occurs when the WH-phrase is moved from a single member of a coordinate structure. This violation happens, because the WH-phrase passes two bounding nodes, the NP and the IP respectively (see example (7) below).

(7) \* [<sub>CP1</sub> What<sub>i</sub> did [<sub>TP</sub> John find [<sub>NP</sub> the ball and t<sub>i</sub> ]]]?

*The empty category principle (ECP):*

The ECP proposed in Chomsky (1981) states that [e] (a non-pronominal empty category) must be properly head-governed by either lexical heads or local antecedents. The sentences which violated ECP could be categorized as follows: *subject/object asymmetries*, *PP/Adverbial Islands* and *Specified Subject Constraint*. They will be discussed below.

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### *Subject/object asymmetries:*

There are three types of subject/object asymmetries: superiority violations, the *that*-trace effect, and sentential subject island violations. In accordance with subject/object asymmetries WH-movement from object position is possible whereas extraction from subject position is not possible and causes ungrammaticality. The reason for this is that under certain conditions, empty categories in subject position are not properly governed – they have neither a lexical nor an antecedent governor –, whereas empty categories of object position are always properly governed because they are lexically governed by their verb (Bley-Vroman 1988, Hawkins 2001). Compare (8) and (9) below.

### *Superiority:*

- (8) She forgot  $who_i$   $t_i$  said what  
(9) \*She forgot  $what_i$   $who_j$   $t_j$  said  $t_i$

In grammatical (8) the empty category  $t_i$ , which is the trace of *who*, is antecedent governed by *who* in SPEC-CP of the embedded clause. In contrast, in ungrammatical (9), although  $t_i$  is properly governed because it is lexically governed by the verb *said*, the trace of *who*  $t_j$  cannot be properly antecedent governed because *who* cannot occur in SPEC-CP since that position is already occupied by *what*. The same violations occur by extraction from *that*-clauses, as illustrated in (10) and (11):

### *that*-trace effect

- (10) [<sub>CP1</sub> What<sub>i</sub> did [<sub>TP</sub> Frank say [<sub>CP2</sub> [<sub>c</sub> that [<sub>TP</sub> Judy would like to read  $t_i$ ]]]]]?  
(11) \*[[<sub>CP1</sub> What<sub>i</sub> did [<sub>TP</sub> John say [<sub>CP2</sub> [<sub>c</sub> that [<sub>TP</sub>  $t_i$  would fall on the floor, if we're not careful]]]]]]]?



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In (10) the trace of *what* in object position does not cause any violation, it is properly lexically governed by the verb *read*. However, the empty category in subject position in (11) cannot be properly lexically governed by the verb. Moreover, the complementizer *that* is not a proper antecedent governor in this configuration and this causes violation of the ECP. The presence of ‘that’ as overt head of the embedded CP makes it impossible for an antecedent governor to occupy SPEC position of the embedded CP. The third category of the subject/object asymmetry is the sentential subject island. When a sentential form follows the matrix verb of a sentence, extraction from it may occur, but when a sentential form is the subject of a sentence, an element extracted from it causes violation. These two forms are given in (12) and (13).

### *sentential subject islands*

(12) \* $[_{CP} \text{What sort of food is } [_{TP2} t_i [_{TP} \text{PRO to digest } t_i \text{ easy}]]]$ ?

(13)  $[_{CP} \text{What kind of book is it necessary } [_{TP2} t_i [_{TP} \text{PRO to read } t_i ]]]$ ?

In both (12) and (13) the empty categories in the deep-structure are properly governed by the lexical verbs ‘digest’ and ‘read’, but the situation differs for the intermediate empty categories. In (13) it is properly governed by the lexical predicate ‘necessary’ in the matrix clause, however, in (12) this is not the case. Since the INFL in the matrix clause cannot lexically or antecedently govern the intermediate empty category in (12), this ends up with a violation.

### *PP/Adverbial Islands*

PPs occur as complements and adverbials as adjuncts to a verb. Extraction from an adjunct always ends up with ungrammaticality, because it is not properly governed by a lexical head.

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When extraction from a complement takes place, it is properly governed by a lexical category.

Consider examples (14) and (15):

(14)  $[_{CP} \text{ Which bed}_i \text{ does } [_{TP} \text{ John like to } [_{VP} \text{ sleep in } t_i]]]$ ?

(15)  $*[_{CP} \text{ What time}_i \text{ will } [_{TP} \text{ Mary } [_{VP} \text{ arrive before } t_i]]]$ ?

In (14) the empty category is governed by a lexical category, the preposition *in*, whereas in (15) the empty category cannot be governed by a proper lexical category, because *before* is not a lexical or antecedent governor.

### *specified subject constraint*

Extraction from a specified subject also causes ungrammaticality; compare examples (16) and (17).

(16)  $[_{CP} \text{ What did } [_{TP} \text{ Mike see } [_{NP} \text{ pictures of } t_i ]]]$ ?

(17)  $*[_{CP} \text{ What did } [_{TP} \text{ Mary hear } [_{NP} \text{ Bill's stories about } t_i ]]]$ ?

In (16) there is no specified subject in the NP; therefore, extraction from this NP is possible.

However, in (17) *Bill's* is a specified subject of the NP, and, as can be seen extraction from this NP results in a violation.

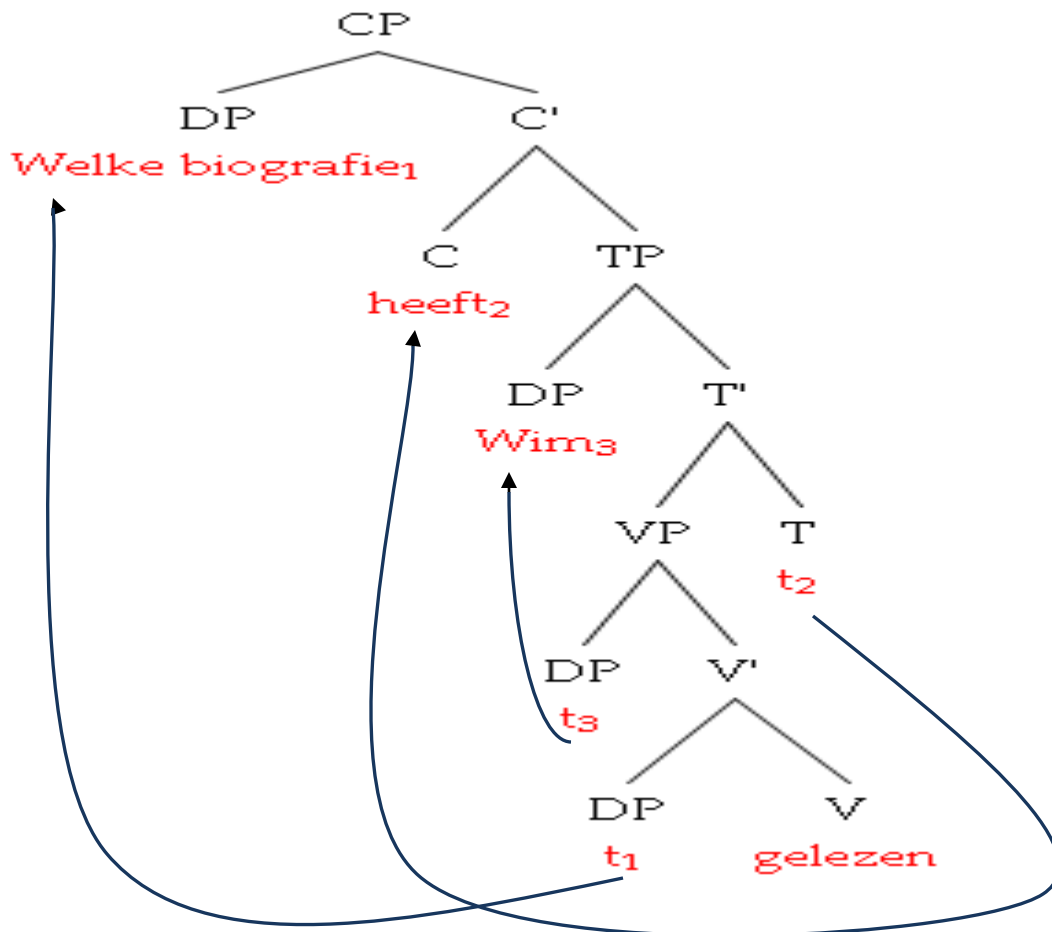
To summarize, English is a language that has WH-movement. Questions are formed by moving the WH-constituent to sentence initial position, and this movement occurs at surface structure.

## 2.2 WH-questions in Dutch

Like English, Dutch is also a language with WH-movement. For example, the sentence presented in (18) is grammatical. Its analysis is shown in (19).

(18) [<sub>CP</sub> Welke biografie<sub>j</sub> heeft<sub>i</sub> [<sub>TP</sub> Wim t<sub>j</sub> gelezen t<sub>i</sub>]]? (cf. e.g. Bennis & Israël 214, 2000)

(19) ‘Which Biography has Wim read?’



The WH-phrase *welke biografie* has moved from the object position within the VP in the TP, to the specifier position of the clause initial CP, leaving a trace in the VP. Movement also applies to

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the verb *heeft* ‘has’; it has moved from head of the TP to the verb second position adjoining to the head of CP. The subject DP *Wim* has also moved from the VP to Spec-TP. The movement of *welke biografie* to sentence-initial position takes place in order to make a WH-question. This constituent becomes the topic of the sentence. In Dutch WH-movement is an instance of topicalization in that other kinds of DPs, and other kinds of phrases, can also move to sentence-initial position. In this regard, Dutch WH-movement differs slightly from English WH-movement. However, as in English, Dutch WH-movement to Spec-CP always takes priority over topicalizing some other phrase, at least in the unmarked case. This movement can also take place in an embedded clause, as is illustrated in (19). However, in embedded clauses topicalization does not occur because C is already obligatorily occupied by *dat* ‘that’.

(19) [<sub>CP</sub> Wie<sub>j</sub> denk je [<sub>CP</sub> dat [<sub>TP</sub> hij t<sub>j</sub> gevraagd heeft]]]?



Dutch differs from English in that the complementizer *dat* ‘that’ must always be phonetically overt in embedded clauses. Under all conditions an embedded clause starts obligatorily with a complementizer *dat* ‘that’ in Dutch. In languages like Dutch the complementizer *dat* is needed to introduce an embedded clause; otherwise it cannot be parsed. For this reason, Dutch lacks a *that*-trace effect.

To summarise, Dutch is also a language that has WH-movement. In order to make a question, like in English, the WH-constituent moves to sentence initial position at surface structure. However, there is an important difference between Dutch and English in the optionality of the complementizer *that* in embedded clauses. English has this optionality in most contexts, whereas in Dutch it never does.

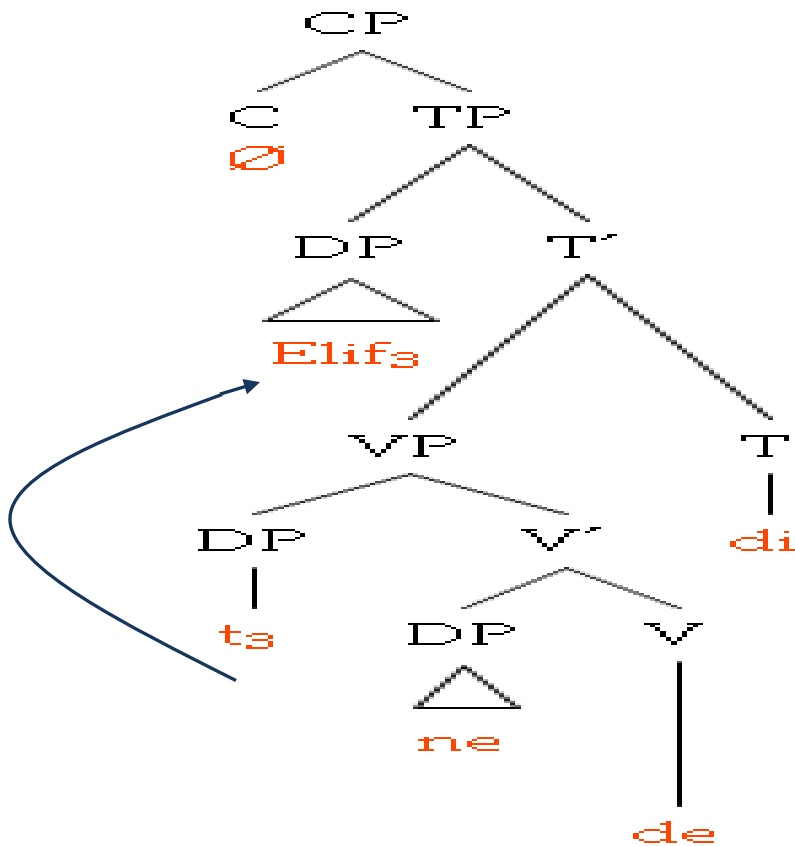
### 2.3 WH-questions in Turkish

Unlike English and Dutch, Turkish has no WH-movement, it is called a WH-in-situ language.

The Turkish WH-word *ne* ‘what’ in 20a, *kime* ‘who-DAT’ in 20b, *ne zaman* ‘what time’ in 20c and *kim* ‘who’ in 20d are canonical in situ WH-questions<sup>2</sup>. They do not show movement to sentence-initial position like English or Dutch. Consider the analysis of (20a).

(20) a. Elif ne de-di? ‘What did Elif say?’ (e.g. Özsoy 1996a)

Elif what say-PAST<sup>3</sup>



<sup>2</sup>Turkish, like Japanese, can scramble a wh-word just as it can scramble any DP, but this is not wh-movement.

<sup>3</sup>The meanings of the abbreviations in this study are as follows: POSS=possessive, 1<sup>ST</sup>= 1<sup>st</sup> person, 3=3<sup>rd</sup> person, PL= plural, PROG=progressive, GEN=genitive, ACC=accusative, PAST=past tense, DAT=dative, NOM=nominative, PRES=present tense, LOC=locative.

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- b. Hakan kitab-ı kim – e ver-di? ‘Whom did Hakan give the book to?’  
Hakan book-ACC who-DAT give-Past (e.g. Özsoy 1996a)
- c. Misafir-ler ne zaman gel-di? ‘What time did the guests come’ (e.g. Özsoy 1996a)  
guests-PL what time come-PAST?
- d. Ben-i kim arı-yor? ‘Who is looking for me?’ (Çokçetin & Öztürk 1992)  
I-ACC who look^for-PROG

The same things happen in embedded structures as can be seen in (21), the WH-word *ne zaman* ‘what time’ stays in the embedded clause and does not show movement.

(21) Akın [ben-im ne zaman gel- me- m- i söyle-di?

Akın I-1GEN what time come-NOM-1POSS-ACC say-Past

‘When did Akın say I should come’

Note that in (21), even though the WH-word appears in the embedded clause, its scope is over the matrix clause (Özsoy 1996a). There also are cases when a WH-word may be positioned sentence- initially; however, this should not be confused with the obligatory WH-movement of languages like English which occurs at surface structure. WH-movement is unmarked in English and Dutch and obligatory if ordinary prosody is used; however, with special (marked) prosody and special (marked) meaning, it is in principle possible for WH-words to remain in situ in both English and Dutch. The marked and unmarked usage in English is exemplified in (22a) and (22b) respectively.

- (22) a. He said WHAT? (marked: exclamations or echo questions)  
b. What did he say? (unmarked: information-seeking questions)

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In Turkish scrambling of the WH-words may occur, which is marked and conditioned by information structure (for example: ‘focus’ or ‘emphasize’, see discussion below). An example is (23). The WH-word appears sentence-initial, which is not, in fact, its deep structure position, the in situ WH-word *kime* ‘who-DAT’ would come before the verb, as in example (20b), represented here again as (23).

(23) Kim-e Hasan kitab-ı ver-di? ‘Who did Hasan give the book to?’

Who-Dat Hasan book-Acc give-Past

Another fact of the scrambling rule in Turkish is that any WH-word can appear in sentence initial position, this is not the case in English. According to Göksel & Özsoy (2000 in Özsoy 2009), Turkish is a ‘focus field’ language and a WH-constituent which has moved to sentence initial position bears stress. This is done “to satisfy certain discourse conditions” (Özsoy 1996a).

Consider the following examples (24 a, b and c) (e.g. Özsoy 1996a):

(24) a Kim Kim-e ne-yi sat-tı? ‘Who has sold what to whom?’

Who who-DAT what-ACC sell-PAST

b Kim-e kim ne-yi sat-tı?

c Ne-yi kim kim-e sat-tı?

All three sentences have the same meaning, the wh-word in sentence-initial position bears stress.

To summarise, Turkish is a wh-in-situ language and differs from English and Dutch in that it lacks true WH-movement. However, in Turkish the WH-word can also be situated in

sentence initial position. This is possible according to the scrambling rules of Turkish, but these should not be confused with the obligatory WH-movement rules of English and Dutch.

### **3. Language Acquisition Assumptions**

#### **3.1 The Critical Period Hypothesis (CPH)**

A lot of research has been done and is still continuing on first (L1) and second language (L2) acquisition since Lenneberg (1967) put forth the Critical Period Hypothesis (CPH) for language learning, i.e. a critical or a sensitive period for (first) language acquisition. When Lenneberg was working on the loss of language in young children, he suggested that by approximately the onset of puberty, there is a loss of “neural plasticity” and “reorganizational capacities” in the brain, after which fully mastery of a language becomes progressively difficult to attain (Johnson & Newport 62, 1989). Before this critical period there is no need for special instruction, the child will acquire the language he/she is exposed to without any effort. At the time Lenneberg stated his hypothesis it was not possible to investigate the matter directly, and one could not be very satisfied with the conclusions drawn from studies of “wild” or “feral” children, who had lived on their own in the wilderness (Fromkin et al. 2007, Hurford 1991). An example for such a case was in India, where two feral children were reported to have been brought up by wolves (Fromkin et al. 53, 2007; for more discussion, Koehler 1952, Singh and Zingg 1942, Brown 1957).

Therefore, Lenneberg’s evidence for his hypothesis was from the aphasia patients and the mentally retarded individuals (mongoloids). He noted that children afflicted by aphasia during the critical period generally had the chance to recover totally from their impairment, and learn language again, but for the adult aphasia patient there was often no possibility of a full recovery.



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As a result, their speech deficit generally remained. As regards the mentally retarded who do not show any language development after puberty, Lenneberg summarizes the observations of his study in this way: “even in the absence of gross structural brain lesions, progress in language learning comes to a standstill after maturity” (Lenneberg 154-155, 1967).

In 1970, after publications of his seminal article, more support for Lenneberg’s hypothesis became available when a child called Genie was discovered. She had been reared in an isolated environment (her bedroom) and had been denied any social interaction from the age of eighteen months till approximately the age of thirteen years. Susan Curtiss (1977) reported that even after several years of language training and rehabilitation Genie was not able to acquire her native language fully. She was able to acquire a large quantity of abstract and concrete lexical items, but acquisition of syntax and morphology was never completely mastered. Genie cannot produce complex sentences. Whereas the language faculty is normally located in the left hemisphere, tests of Genie’s lateralization of language demonstrated that her language was right-hemisphere lateralized and this was probably the result of the late acquisition of her L1, i.e. acquisition after the critical period. Curtiss indicates that after the critical period, the functions for language acquisition in the left hemisphere may fade away (Curtiss 1977 in Fromkin et al. 2007, Hurford 1991, Johnson & Newport 1989).

Another case which supports the critical period hypothesis is the case of a woman called Chelsea, who was 31 years when it was finally realized that she was not retarded, but merely deaf. Like Genie, she also subsequently received years of language training. She too was capable of learning vocabulary, but never able to acquire a grammar (Fromkin et al. 2007).

Results of research on American Sign Language (ASL) also provide evidence for the critical period hypothesis. Ploog (1984) reports that children, who have acquired ASL after the

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age of 7 demonstrate a kind of foreign accent in signing. Lenneberg's comment on this is that these learners will not be native like signers (in Ploog, 1984). Further evidence for the CPH comes from a study by Newport and Supalla (1987). They investigated the language acquisition of congenitally deaf people whose exposure to American Sign Language (ASL) as a first language varied with respect to age. Since the majority (90%) of the deaf people have hearing-speaking parents, only a small number of them start acquiring ASL from birth. The rest are first exposed to ASL only when they go to school, i.e. not until around age 4. In their study, Newport and Supalla (1987) chose subjects with at least 40 years of ASL experience in order to test their ultimate attainment of ASL. They divided their subjects into three groups: *native learners* (exposed to ASL from birth), *early learners* (exposed to ASL at ages 4-6) and *late learners* (exposed to ASL at age 12 or later). All groups were tested on their performance in production and comprehension of ASL verb morphology. Their results demonstrated that the native learners were the best performers followed by early learners and finally the late learners. This study suggests that there is a linear relationship of native like performance and age at first exposure, which also in a way supports Lenneberg's hypothesis. However, this study on CPH does not support the notion that the critical period ends abruptly; rather, the available empirical evidence suggests that the critical period gradually ends, perhaps over a period of several years. It could be concluded that there is a peak of sensitivity before puberty, and in the case of the Newport and Supalla study there could be varying peaks of sensitivity before the onset of puberty, depending on age. Research on the CPH by several investigators (e.g. Fromkin, Krashen, Curtiss, Rigler and Rigler 1974), also support the claim that learning after the critical period is possible at least to some degree.

In sum, research on the CPH suggests that first language acquisition is not completely learnable after puberty, but it can be learned to some extent, i.e. with varying ultimate-attainment varying across individual learners. In addition, it is highly possible that it never reaches a native like level of linguistic competence.

### **3.2 The CPH and Second Language Acquisition**

Many researchers have focused more on the CPH in Second Language Acquisition (SLA), because it is hard to find evidence of adults who have not been exposed to their first language after birth and childhood. Various methods have been applied to test the relation between the onset age of L2 and the ultimate attainment in the target L2. A brief theoretical summary will next be presented.

Some researchers have pointed out that there is a critical period for the acquisition of phonology (Scovel 1988; Singleton 1989; Bahrack, Hall, Goggin, Bahrack & Berger 1994 in Flege, Yeni-Komshian & Liu 1999; DeKeyser 2000; Bever 1981 in Flege 2003). Researchers like Long (1990) and Hurford (1991) claim that the critical period for phonological rules may fade away earlier than grammatical rules, which would suggest that during the critical period the brain is more sensitive to phonological issues (perception and production of speech sounds). Other researcher debated the relation between onset age of L2 acquisition and the degree of foreign accent, and some propose the “the earlier, the better” account (Flege 1999, Seliger, Krashen & Ladefoged 1975). This is the claim that the earlier one starts to acquire a foreign language, the better (more native-like) one’s accent will be. Consistent with the CPH, different ages have been put forth as borderline for a marked foreign accent. For example, Long (1990)

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concluded from a review of previous studies that before the age of 6 L2 acquisition is possible without a foreign accent, that between the ages 6 and 12 L2 phonology ends with varying success, and that after 12 a foreign accent is inevitable. Patkowski (1990) noted that there is a qualitative difference in the acquisition of L2 before and after the critical period. This suggests that the acquisition of L2 pronunciation after the critical period diminishes and the result is a foreign accent, but there seem to be discrepancies on the exact age this takes place. Furthermore, in order to test the CPH not only phonological issues were taken into account, but also grammatical ones.

Some of the earlier studies on the CPH with respect to syntactic competence were those of Oyama (1978) and Patkowski (1980). They tested the differences in the ultimate attainment of syntactic knowledge between children and adults. In both studies USA immigrants whose onset age of English was age on arrival (AOA) were tested for their English linguistic knowledge. Moreover, they had to have lived in the USA for at least 5 years. The outcomes of both studies showed that age of arrival was the only significant predictor of syntactic proficiency. The significance of the age factor supports the CPH.

A following study by Johnson and Newport (1989) – henceforth J & N – confirmed the findings of Patkowski (1980) who observed a steep decrease in performance when the AOA was 15 years or greater. The participants in the Johnson & Newport's study consisted of 46 native Chinese and Korean speakers. The subjects who had arrived in the USA before the age of 15 were considered *early arrivals* and the ones arriving in the USA after the age of 17 were considered *late arrivals*. These participants were tested on their linguistic knowledge of English by means of a grammaticality judgment task which consisted of 276 sentences. The sentences represented 12 basic rules of English grammar (past tense, plural, third person singular, present

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progressive, determiners, pronominalization, particle movement, subcategorization, auxiliaries, yes/no questions, WH-questions and word order). The results showed that the age of arrival was the better measure than attitudinal variables (identification, self-consciousness and motivation). The strongest correlation was between the AOA and the test score ( $r = -.77$ ). For the early arrivals this correlation was  $-.87$ . J & N (1989) pointed out that subjects who had arrived in the USA before the age of 7 showed native like performance on the task. A linear decline in performance was observed for early arrivals after age 7 until puberty. Moreover, the performance of the late arrivals as a group was poorer than that of the early arrivals. J & N (1989) concluded that their study confirmed maturational state hypothesis (MSH) and disconfirmed the exercise hypothesis (EH). The MSH is the claim that any language must be acquired in childhood. The EH is the claim that only L1 should be acquired during childhood, once this is established, language learning will continue on the whole life span. In sum, J & N's study of whether the CPH is also effective in L2 acquisition demonstrated that there was indeed a sensitive period before age 7 and a decline in sensitivity after age 15, thus, confirmed the CPH. However, there are also opposite views as to the validity of a critical period.

According to Birdsong and Molis (2001) (henceforth: B&M 2001), "age effects prior to but not after the end of maturation, near-zero incidence of native-like levels of attainment, and the generalizability of these results across L1-L2 context" would provide evidence for a critical period in L2 acquisition (p. 247). They tested their claim by replicating the study of J & N (1989). B & M (2001) used almost the same procedures and materials as in J & N's (1989) study. They excluded one pair of sentences and used 274 test sentences. The participants were 61 Native Spanish speakers. They were divided in two groups early arrivals ( $n = 29$ ) and late arrivals ( $n = 32$ ). The results indicated that for the early arrivals ( $AOA \leq 16$ ) in this study there

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was no significant correlation between AOA and test scores ( $r = -.24, p = .22$ ), on the contrary, for the late arrivals ( $AOA \geq 17$ ) there was a strong correlation between AOA and performance on the test ( $r = -.69, p < .0001$ ). B&M's (2001) results and J & N's (1989) results differed in this, and the general performance of the Spanish groups was considerably better than the Chinese and Korean groups. Typological similarities between native and target languages seem to influence the results, and empirical studies confirm this (for example, Bialystok & Miller 1999, Bongaerts 1999, Cranshaw 1997, Kellerman 1995, Sorace 1993 and van Wuijtswinkel 1994).

To return to the claim of B & M (2001) that “age effects prior to but not after the end of maturation” is evidence for a critical period in SLA seems to lack validity. Adults and children simply do not acquire language in the same manner because non-biological cognitive, educational and social factors seem to have influence on L2A (Herschensohn 2007). Therefore, individual achievement inconsistency among early and late second language learners is inevitable. As can be seen from their results, age effects are not similar to the results of the  $AOA \leq 17$ . The higher scores of the early arrivals show that there is a difference in the L2 acquisition of early and late arrivals, which indicates that this might result from a critical period and other cognitive, educational and social factors. In addition, that there would be age effects after maturation is not surprising because after a certain age there is a loss of cells in the brain (Terry, Teresa & Hansen 2004). The findings of late arrivals of B & M (2001) and J & N (1989) might be the consequences of this age-related loss of brain cells.

Returning to B & M's other claim that provides evidence for a critical period in L2 acquisition is that there should not be cases of native-like attainment. B & M (2001) report that one *late arrival* subject showed native-likeness. They argue that this could have been the result of the insufficiency of the material and procedure to represent the grammar of the target

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language. In this case the only late arrival subject in B & M's study is questionable. On the other hand, researchers like Hyltenstam & Abrahamsson (2000) claim that there have not been cases in which a post-pubertal L2 beginner reached a level of proficiency that is identical to a native speaker in every linguistic detail. Hyltenstam & Abrahamsson (2000) also report that studies at "level of subtle detail" suggest that very early L2 beginners differ from monoglot native speakers. On lexico-grammatical issues very early beginners have shown difference from native speakers (e.g. Hyltenstam & Abrahamsson 2000, Hyltenstam & Abrahamsson 2003a, b, Abrahamsson & Hyltenstam 2009). Moreover, studies of researchers like Ionin & Wexler (2002) and Belletti & Hamann (2004) show that L2 acquisition of children is more like the L2 acquisition of adults, rather than L1 acquisition. To sum up, on contrary to what B & M claim, it seems that age effects after the end of maturation are quite normal to happen because of the difference in the individual achievement in L2A that results from individual differences, for example, language aptitude, motivation or learning styles (Dörnyei 2005). In addition, there are studies which claim that even very early L2 learners differ from native speakers.

### **3.3 Bilingualism**

Bilingualism is being able to communicate in two languages. This means being fluent in all language skills speaking, reading comprehension, writing, and listening comprehension. The acquisition of two languages could begin from birth or at a later age – for example, at approximately age 4 (Meisel, 2009). The former case is referred to as simultaneous bilingualism, the latter as successive (or sequential) bilingualism. It is assumed that the second language knowledge of an early bilingual tends to be located in the area of the brain where the L1 is

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established, while the L2 knowledge of the late learners is situated distant from the L1 area. There are various studies confirming this generalization. For example, a functional magnetic resonance imaging (fMRI) study by Kim, Hirsch, Relkin, De Laz Paz, and Lee (1997) demonstrated that second language was situated “along the periphery of the Broca’s and Wernicke’s regions in the case of late learners, but not in the case of early learners” (Hagen 46, 2008). Similar results were found in Hernandez, Dapretto, Mazziotta & Bookheimer (2001). Their subjects were six Spanish-English bilinguals who had acquired both languages before age 5. The fMRI testing indicated that both languages were situated in an overlapping region of the brain (in Hagen, 2008). Wartenberger et al. (2003) studied 32 Italian-German bilinguals using the fMRI testing. They divided the bilinguals into three groups. The first group consisted of 11 early bilinguals who had acquired both their language from birth and who were fluent native speakers of both languages. The second group was 12 monolinguals who had acquired an L2 in early adulthood (mean age of acquisition was 18;9) and had a high level of proficiency in this L2. The third group was 9 monolinguals who had acquired an L2 at a late age (mean age of acquisition: 20;4) and who had limited proficiency. The results showed that the age of acquisition was statistically significant and also played an important role in determining the regions of grammatical processing in the brain (for more similar studies: Dehaene et al., 1997; Halsband et al., 2002; Ojemann & Whitaker, 1978). These studies demonstrate that for the early and late learners knowledge of an L2 is situated in different areas of the brain. This suggests that the brain of early bilinguals will show the capacity of a native speaker for both languages, since both languages are situated in the L1 region. However, the good or poor command of L2 by late L2 learners could result from varying factors such as ‘qualitative or quantitative input effects’ or individual differences in L2 acquisition (Unsworth, 2008; Unsworth & Blom, 2010; Place &



Hoff, 2011). Moreover, Hagen (2008) concludes that the L1/L2 acquisition differences “result from fundamental changes in cognitive abilities that are in some way the consequences of our biological endowment” (p. 47). The Turkish-Dutch bilinguals in this study who are tested on their L3 acquisition are successive bilinguals. According to the previous fMRI studies these early bilinguals will show native like performance in both languages (i.e. Turkish and Dutch).

There are also non-fMRI studies which show that the L2 acquisition of early successive bilinguals is similar to L1 acquisition. A study by Prévost (2003) on the acquisition of verb inflection and sentence structure of German by an L1 English-speaking child shows the developmental procedure of L1 German acquisition. In the study of Rothweiler (2006) with early Turkish-German successive bilinguals the acquisition of specific grammatical areas, i.e. V2 (verb-second) position, subject-verb agreement and subordinate clauses resembles L1 German acquisition. Similar results were found in the study of Kroffke & Rothweiler (2006). They investigated the acquisition of German sentence negation by Turkish-German successive bilinguals, aged 3 to 4 and aged from 6 onwards. Children aged 3 to 4 portrayed L1 acquisition, whereas children aged 6 did not resemble L1 acquisition.

### **3.4 Meta-linguistic awareness**

It is possible that the good command of two languages, and the knowledge of learning mechanisms, will positively influence the acquisition of a third language. Cenoz (2003) suggests that L3 learners “are influenced by the general effects of bilingualism on cognition, and have access to two linguistic systems when acquiring a third language”. Several psycholinguistic studies have shown that the activation (in the sense of availability) of these two systems even

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occurs when bilinguals use only one language (Grainger, 1993; Guttentag et al., 1984; Hermans et al., 1998 in Bialystok, 2007), which would suggest that these systems are always activated.

According to Bialystok, bilingual children tend to be better than monolingual children “in executive control of attention” (1986a, for more discussion: Bialystok 1991, 2001, 2007; Ricciardelli 1992). To test this “executive control of attention hypothesis” Bialystok used a grammaticality judgment task and trained children to decide whether a sentence was grammatical (“said the right way”) or ungrammatical (“said the wrong way”). The children were told that silliness was okay in this game. They were presented sentences like: (1) ‘Apples grewed on trees’ and (2) ‘Apples grow on noses’. Representational knowledge of linguistic structure is required to correctly judge the first sentence ungrammatical. To correctly judge the second sentence grammatical but silly, Bialystok claims that ‘attentional control’ is required.

“Attentional control” requires “the ability to ignore the misleading anomaly in meaning and focus attention only on the form of the sentence” (Bialystok 213:2007). The results showed that the bilingual children were much better than the monolingual children in ignoring the meaning and accepting the second sentence to be correct. However, one might wonder why there is no need for “attentional control” to correctly judge the first sentence ungrammatical. You have to pay attention to the linguistic form in order to notice that “growed” should be “grew” or “grow”. There should be other innate factors (such as a(n) (extended) critical period in which UG is optimal accessible) playing a role in the better performance of the bilinguals. Furthermore, it is highly possible that this meta-linguistic awareness, (proposed by Bialystok 1986, Ricciardelli 1992) ‘executive control of attention’, would not help the bilingual learner acquire knowledge of a constraint like the *That*-trace effect. There is nothing to pay attention to in the case of negative facts.

### 3.5 L1 vs L2 Transfer

Previous studies (Cenoz and Valencia, 1994; Lasagabaster, 2000; Muñoz, 2000; Sanz, 2000) have shown that bilinguals who have a good command of both languages outperform monolinguals in the acquisition of a subsequent language. Many factors could have influence on L3 acquisition. Possible factors might be the transfer of L1 to L3 or L2 to L3, or non-transfer at all. Several hypotheses have been proposed on this issue. For example, the *no transfer hypothesis* supported by Clahsen and Muysken (1986) suggests that there is no transfer from L1 or any beforehand learned language, and UG does not play any role in the acquisition of a subsequent language (in Bardel & Falk, 2007; cf. Rothman et al. 2011). Moreover, they state that learning a language is only based on general cognitive learning strategies (p. 462). The *L1 transfer hypothesis* proposes that only the properties of L1 are transferred and there is no transfer of L2 properties to L3 (Bardel & Falk, 2007; cf. Rothman et al. 2011). The *L2 transfer hypothesis* ‘L2 status factor’, first proposed by Williams and Hammarberg (1998), suggests that only L2 properties are positively transferred to L3. The studies of Bardel & Falk (2007) and Falk & Bardel (2011) confirm that there is (positive) influence of L2 to L3. Bardel & Falk (2007) tested four hypotheses on the placement of sentence negation in the third acquired V2 languages: (1) the non transfer hypothesis, (2) the L1 transfer Hypothesis, (3) the L2 transfer hypothesis, and (4) the Cumulative Enhancement Model (CEM). The placement of negation in V2 languages is as follows: In main clauses of V2 languages like Swedish, German and Dutch the finite verb raises to the C. The negation stays in its original place above the verb phrase. In Bardel and Falk’s study they tested two L3 learner groups. Group (A) were L3 Swedish (a V2 language) learners. Three participant of this group had Dutch as L1 (a V2 language) and English as L2 (a non-V2 language). The L1 of the other two participants was English and Hungarian, both a non-

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V2 language. The L1 English participant had German/Dutch as L2, and the L1 Hungarian had Dutch as L2, both L2's are V2 languages. Group (B) consisted of 4 participants whose L3 was either Dutch or Swedish. Two participants' L1 was Swedish and their L2 was English. The other two participants' L1 was Italian or Albanian, both a non-V2 language. One of the participants' L2 was German/Dutch and the other's was German. The results revealed that the participants with a non-V2 L1 outperformed the participants with a V2 L1 and non-V2 L2. The authors conclude that in L3 acquisition the L2 status factor overrides the typological factor. In this study, the typological proximity favors transfer from L2 to L3 and not from L1 to L3. Similar results were obtained from their study with the acquisition of object placement in L3 German (Falk & Bardel 2011). Once more they found out that L2 had more influence than L1 on L3 acquisition, in this study it was either positive or negative.

Flynn et al. (2004) proposed the Cumulative Enhancement Model (CEM), which suggests that any language learned beforehand can facilitate any L3/target language acquisition, "but the L2 only supersedes the L1 when the structure 'searched for' is not present in the L1" (in Bardel & Falk 474: 2007). In other words, the typological proximity of an L2 to an L3 will enhance transfer. And Flynn et al. (2004) also claim that the L2 effect will be positive or stay neutral.

To summarise: Some researchers state that general cognitive learning strategies is the only factor that has impact on language learning, whereas other researchers support the hypotheses of L1 transfer effect, L2 transfer effects or transfer effects from both L1 and L2.

### 3.6 Hypotheses

The purpose of this master thesis is twofold. The first objective is to provide evidence for the hypothesized extended critical period for (Turkish-Dutch) bilinguals with respect to the acquisition of a L3 grammar. More specifically, high school students will be examined for their L3 acquisition of WH-movement sentences in English. The second objective is to investigate the cross-linguistic language influences (transfer effects) of L1 to L2 and/or L2 to L3, and for the bilinguals with respect to the 4 hypotheses adopted from Bardel & Falk (2007). The expectation is that the Turkish-Dutch successive bilingual students, who have been exposed to two languages from very early age (from approximately age 4) and who therefore may be more experienced in language learning strategies (for discussion on 'language learning strategies' see Samida 2004, Dörnyei 2005), will show a greater learning capacity in the acquisition of a foreign language in high school than both monolingual Dutch and monolingual Turkish groups. To be more specific, the prediction is that in general the bilinguals will perform better than monolinguals in the late L2/L3 acquisition of English in that they will acquire a better sensitivity to subtle syntactic constraints such as the English *that*-trace effect, which is a special grammatical phenomenon in English. The *that*-trace effect is absent in both Turkish and Dutch. Therefore, neither of these already acquired languages could possibly cause positive transfer, facilitating L2 acquisition of sensitivity to *that*-trace effects. If there were a negative transfer effect, it would be the same in both cases. Moreover, UG principles might play a role as well. Proponents of the UG Accessibility hypothesis, such as Epstein et al. (1996) claim that in L2 acquisition only UG is available, and there is no interference of L1. However, this will not explain a possible difference that might arise in the performance of the DM, TM and TDB groups. If only UG was available, then the performance of their groups should be the same. The expectation is that there will be

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negative transfer on Subjacency and ECP (with the exception of the *that*-trace effect) violation from Turkish, while for Dutch positive transfer is expected, since the *Subjacency* and the *ECP* violations in English are similar in Dutch but not in Turkish,. Therefore, the monolingual Dutch and the Bilinguals will outperform the Turkish monolinguals on *Subjacency* and the *ECP* (excluding the *that*-trace effect) violations. Moreover, since bilinguals know the grammars of more languages, they will outperform Turkish monolinguals significantly and will even do better than the Dutch monolinguals. Furthermore, the better performance of the TDBs on the grammaticality judgment task will provide evidence for the extension of the critical period for bilinguals, i.e. the Bilingual Extended Critical Period Hypothesis (BECPH). With respect to the given statements above the following hypotheses are formulated:

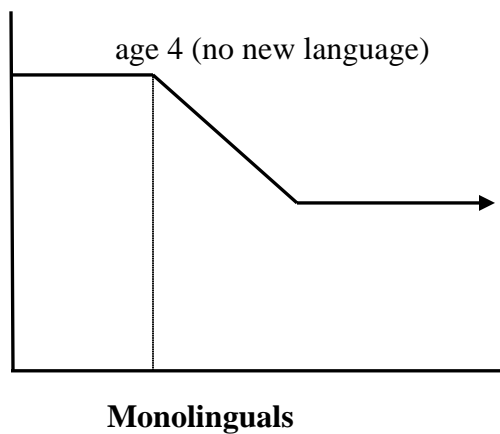
### **Hypothesis 1:**

*The Bilingual Extended Critical Period Hypothesis (BECPH).*

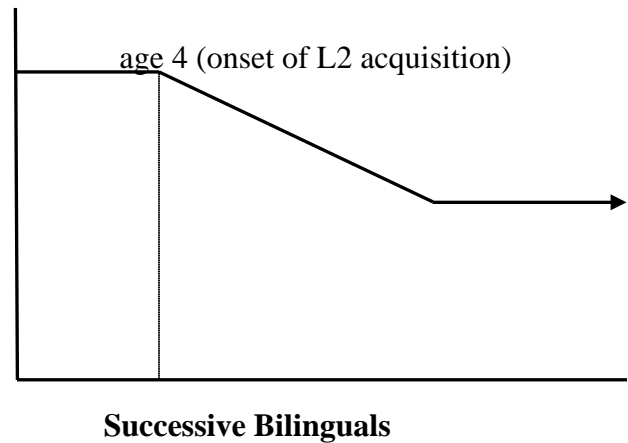
As noted above, evidence for the BECP hypothesis will be provided by the study presented below, which examines the late L3 acquisition of English WH-movement by successive Turkish-Dutch Bilinguals (who started learning English as L3 approximately at age 9). The BECPH predicts that being exposed to two languages from very early age and having more experience in language learning strategies than monolinguals, Turkish-Dutch bilinguals will outperform both monolingual Dutch and Turkish students (who also started English as L3 approximately at age 9 for the DM group and age 8 for the TM group) in a grammaticality judgment task. If this prediction is borne out, this will constitute evidence in support of the BECPH. The idea is that the natural language acquisition device that facilitates L1 acquisition is “kept alive” longer in the case of a successive bilingual, and this will facilitate the acquisition of a subsequent language.

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Moreover, the BECPH also predicts that simultaneous bilinguals will not have any advantage, because they do not learn a new language around age 4. This would mean that they would show monolingual like performance in L3 acquisition. The hypothesized illustration of the critical period and the extended critical period for monolinguals (who are learning a L2 at a later age) and bilinguals is given in Figure 1a and Figure 1b (adopted from Birdsong 2006), respectively.



*Figure 1a*



*Figure 1b*

As the functions ('shapes') given above by Birdsong (2006) for the various hypothesized critical periods, it will be assumed that the 'shape' of the critical period for the bilinguals will be more stretched (see Figure 1b); the slope will not be as steep as for late(r) L2 acquirers (i.e. monolinguals who started acquiring L2 approximately at age 8). Thus, the critical period of the bilinguals will be extended, and this will have positive influence on the acquisition of their next language. The bilinguals' better performance in the grammaticality judgment task would provide evidence for an extended critical period.

### L1 Transfer Hypothesis

This is the hypothesis that there will be negative transfer from L1 Turkish to L2 English in terms of constraints on WH-movement. Because the Turkish monolingual L2ers of English are well past the critical period<sup>4</sup>, they have no access to UG and have no direct access to *Subjacency*. Moreover, since Turkish lacks WH-movement (like Korean), they also have no indirect access to *Subjacency* via their L1. Consequently, they will have trouble in grammaticality judgment tasks, accepting *Subjacency* violations as good sentences and rejecting good WH-questions simply because they instantiate a kind of WH-movement they have never seen before (never in Turkish, not yet in the positive input for English L2 for the *Subjacency* violation sentences). Therefore, the monolingual Turkish subjects will more often accept ungrammatical sentences as grammatical. As for the Dutch monolinguals, they too lack direct access to *Subjacency*, because they too are well past the critical period (i.e. approximately age 8); however, unlike the Turkish monolingual L2ers of English, the Dutch monolinguals will have indirect access to UG via their L1 knowledge (for more discussion of indirect access to UG (see Bley-Vroman *et al.*, 1988).

### Alternative Hypotheses

The predictions of the alternative hypotheses (the 4 hypothesis discussed in Bardel & Falk, 2007) to the L1 transfer hypothesis given above will be tested by the performance of the Turkish-Dutch bilingual group.

- The non-transfer hypothesis

This hypothesis is the claim that there would not be any interference of the previous learned languages. For the current study this hypothesis predicts that 3 experimental groups, the Turkish

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<sup>4</sup>That is approximately age 8: according to the studies of J & N 1989 and DeKeyser 2000 the ages 0 to 7 is the interval in which native-like acquisition takes place, adopting age 8, therefore is past the critical period



## The BECPH and L1 vs L2 Transfer Effects

monolinguals, the Dutch monolinguals, and the Turkish-Dutch successive bilinguals will show similar performance (i.e. their average grammaticality judgments will approximately be similar) in the experiment, as it is assumed that all learners have the same initial state.

- The L1 transfer hypothesis

This hypothesis predicts that the TDB group will show the same performance in the experiment as the TM group. For both groups there would be a negative transfer effect arising from the circumstances that Turkish lacks WH-movement.

- L2-to-L3 transfer hypothesis

This hypothesis predicts that there will be a positive transfer effect from the Dutch L2 of the bilinguals to the English L3 with respect to the knowledge of *Subjacency* and *ECP violations* (except the *That*-trace effect).

- Transfer according to the Cumulative Enhancement Model (CEM)

The CEM suggest that earlier learned languages will influence the development of target languages. If the L1 lacks the language properties of L3 and L2 has the same language properties as L3, positive transfer will take place from L2 to L3. In this study the prediction is that since the L1 Turkish of the bilinguals does not have wh-movement, the transfer effects will be neutral (or in other words, there will be no transfer from L1 to L3). However, there will be a positive transfer effects from Dutch L2 to English L3, because both Dutch and English share the same language properties with regards to *Subjacency* and *ECP violations* (except the *That*-trace effect).

## 4. Experimental study

### 4.1 Participants

The participants in this study consisted of three groups: 34 Dutch monolingual (DM) high school students and 44 Turkish-Dutch successive bilinguals<sup>5</sup> (TDB) high school students, both groups residing in The Netherlands, and 28 Turkish monolingual (TM) students residing in Turkey. All the TDB students come from Turkish immigrant families. Their native language is Turkish and Dutch is their ‘second’ language. They could be considered successive bilinguals, since most of them started acquiring Dutch approximately at the age of four with compulsory public school attendances. The monolingual and bilingual students living in the Netherlands were attending 5 HAVO or 5 VWO schools at the same time of the study. Since the education system is slightly different between Turkey and The Netherlands and there is no division like HAVO/VWO, a comparable “Anatolian secondary” school was selected. Anatolian high schools are selective in that you have to pass 3 SBS exams (SBS, seviye belirleme sinavi) to get in. This make them comparable to the selectivity of HAVO/VWO, which is based on CITO scores. The DM participants were high school students at the Einstein Lyceum in Hoogvliet. The TDB participants were drawn from various different Dutch high schools, one student from the Einstein Lyceum, 6 from the City+ College in Den Haag, and 37 from the Cosmicus College in Rotterdam. The TM students were attending the Kağıthane Anadolu Imam Hatip Lisesi in Istanbul. The mean age of the groups and other aspects of group constituency are shown in Table 1.

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<sup>5</sup> Six from the 50 students were excluded from the test, because they either had not fully completed the test or they just gave one consistent answer to all questions.

Table 1:

	<i>n</i>	mean age	age range	#boys	#girls	Years of EFL instruction
TM	28	16;4	15-17	0	28	±8
DM	34	16;6	16-18	14	20	±7
TDB	44	16;10	16-18	26	18	±7

EFL= English as a foreign language

The TM group consisted only of girls, since the classes in their school were divided into boys' and girls' classes. The girls were selected since it is often the case that girls outperform male peers in high school language learning (Burman, Bitan & Booth 2008). Almost all the girls had had English classes since primary school (see the questionnaire results below), which means that they had approximately 8 years of English. English education in Turkey starts at the 4<sup>th</sup> grade of the primary school. The DM and TDB groups had the same number of years of EFL instruction, which was one year less than the TM group. There was no difference in age range of the DM and TDB groups, but both groups differ slightly from the TM group. The subjects' exposure to English was assessed by means of a brief questionnaire (see below and Appendix A). In order to avoid misunderstanding, the questionnaire was presented out in the native languages of the monolinguals, and in Dutch for the bilinguals. The groups had the choice to choose among 'never, sometimes, often and always'. The results of the questionnaire (see Figures 1, 2 and 3) are discussed below.

1. *Do you read English books/magazines/newspapers etc.?*
2. *Do you watch English TV channels?*
3. *Do you listen to English music?*
4. *Do you play English computer games?*
5. *Did you have English classes at primary school?*
6. *Do you take private courses for English?*
7. *Do you attend extra/supportive English courses?*

Figure 1: Results of the questionnaire of the Dutch monolingual group

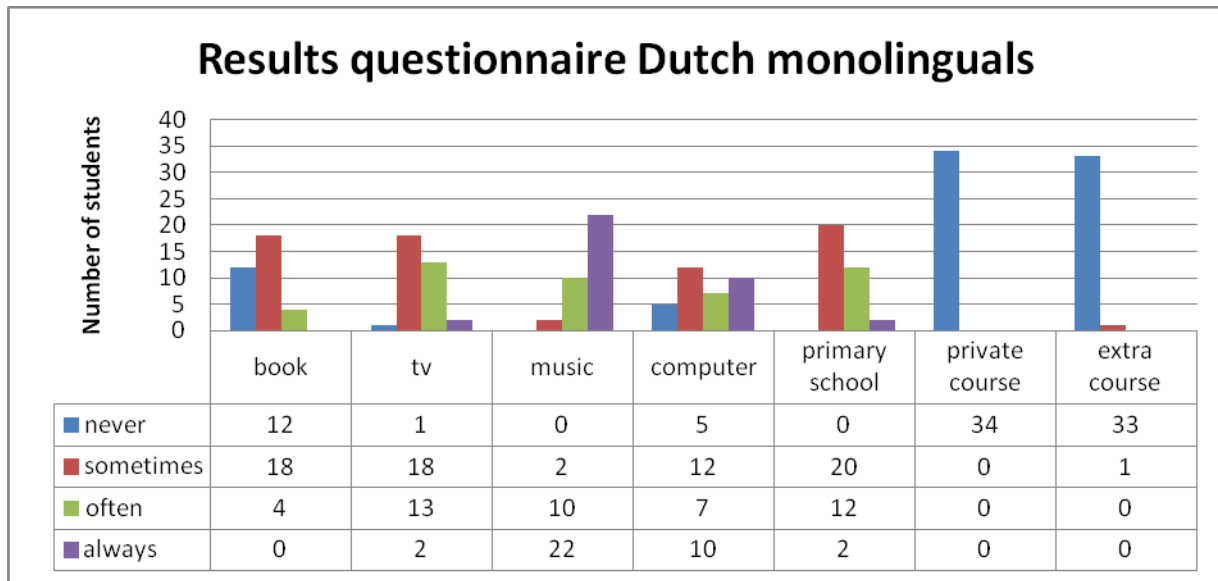


Figure 2: Results of the questionnaire of the Turkish-Dutch monolingual group

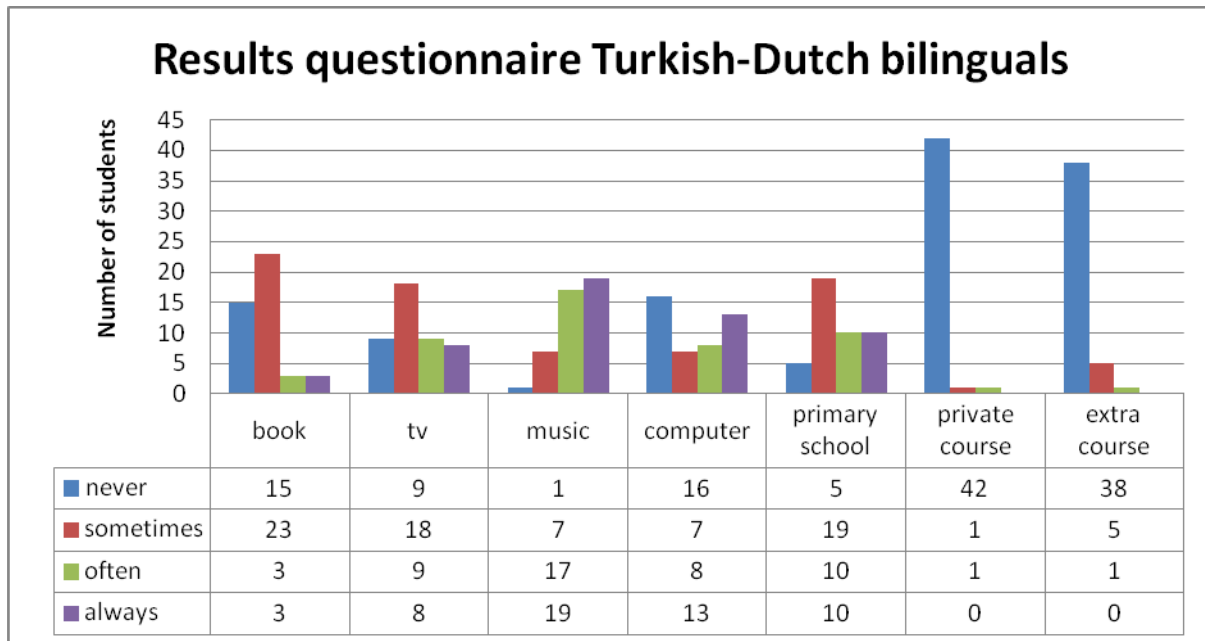
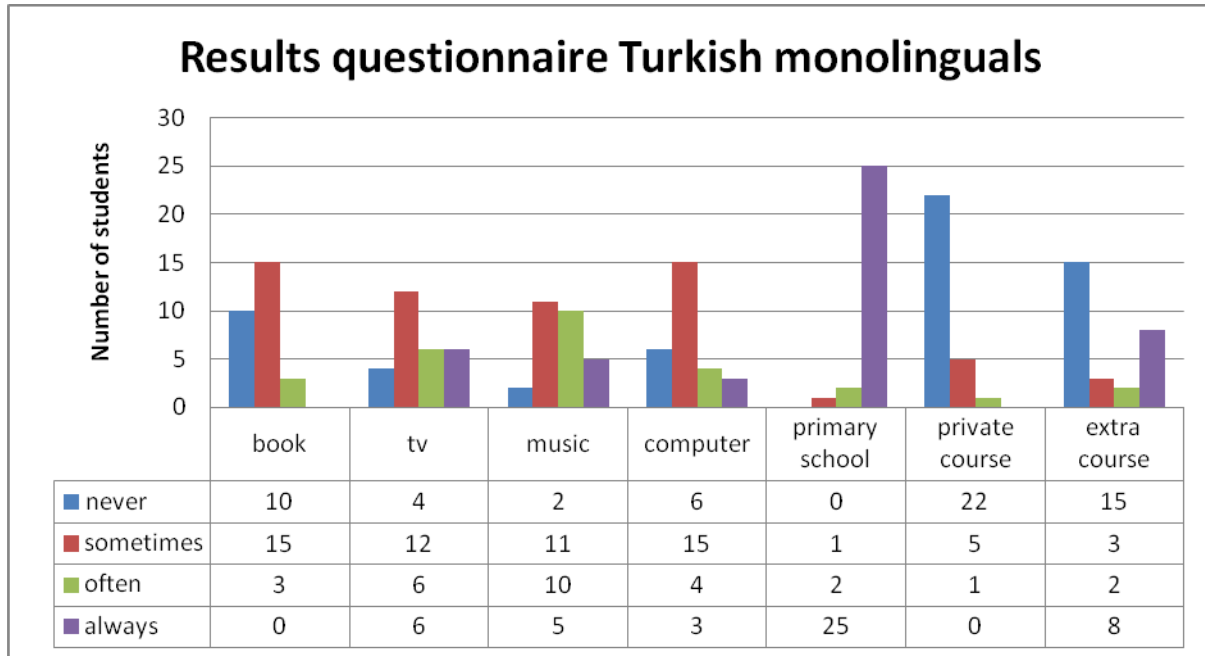


Figure 3: Results of the questionnaire of the Turkish monolingual group



*The results of the questionnaire:*

At first glance, the three groups do not seem to differ significantly in exposure to English.

The results of the bilinguals for questions 1, 3, 5, 6, and 7 are approximately similar to the Dutch monolingual students. They only differ slightly in questions 2 and 4. In addition, the Turkish monolinguals differed from the DM and TDB groups in receiving more English classes at primary school and taking more private or extra English courses. In sum, the following group differences might be needed to be taken into account in interpreting the results of the experiment.

In comparison to Dutch monolinguals, a considerable number of TDBs and TMs never play English computer games. This might influence the results of the grammaticality judgment task.

The results could also be influenced by the fact that the TM group received more English classes at primary school and private courses.

## 4.2 Design

In the actual test, the participants were tested on their knowledge of L2/L3 English WH-question by means of a grammaticality judgment task. The data collected from the grammaticality judgment task were used in order to examine the effect of the three different levels of the between-subjects variable of L1 background. The WH-questions that contained *that*-trace effect, *Subjacency*, and *Empty Category Principle (ECP)* violations. These three sentence types were the levels of the within-subjects variable. The age of the participants and the years of English education was tried to be held as constant as possible.

## 4.3 Materials

The test sentences were replicated from the study of Bley-Vroman *et al.* (1988). The test materials consisted of 17 ungrammatical sentences and 15 grammatical sentences. Except for one item, all the grammatical sentences were WH-questions. The ungrammatical sentences contained violation of either the *Subjacency* principle or the Empty Category Principle (ECP). The types of grammatical and ungrammatical sentences are shown below (for all sentences see Appendix B). The ungrammatical sentences are indicated with an asterisk (\*).

### Subjacency Violations sentence types

*Wh- islands*

1. \*What does Mary want to know whether John has already sold?

*Complex NP's*

a. *Factives*

2. What did Bill think that the teacher had said?
3. \* What did Sam believe the claim that Carol had bought?

*b. Relative clauses*

4. \*Who did John buy the house that had recommended to him?

*Coordination*

5. \*What did John find the ball and?

**ECP Violation sentence types**

*Subject/Object Asymmetries*

*a. Superiority*

6. I can't remember who did what.
7. \*She forgot what who said.

*b. That-trace Effect*

8. Who did Ellen say Max thought would pass the test?
9. 17. \*What did John say that would fall on the floor, if we're not careful?

*c. Sentential Subject Islands*

10. What kind of book is it necessary to read?
11. \*What sort of food is to digest easy?

*PP/Adverbial Islands*

12. Which bed does John like to sleep in?
13. \*What time will Mary arrive before?

*Specified Subject Constraint*

14. What did Mike see pictures of?
15. \* What did Mary hear Bill's stories about?

### Sentences used as controls

*Who/Whom*

16. Who does John want to see?

*Long Movements*

17. What did John think Carol wanted her mother to give to the postman?

*P-Stranding*

18. Where is the person that I want you to talk to?

### 4.4 Procedure

The test was conducted as follows: the participants were told that the test consisted of two parts, a questionnaire and the actual test sentences. First, they were asked to fill in the questionnaire. Next, they were instructed about what a possible English sentence could be. They were informed that native speakers of English had intuitions about possible English sentences. To let them have a better understanding of the grammaticality judgment task, examples of the grammatical and ungrammatical sentences were presented in their native languages. For the monolingual Dutch participants and the Turkish-Dutch bilinguals, the following pairs of sentences were presented (19 a, b and 20 a, b). They were read out loud.

(19) a. De kinderen spelen in de tuin van de burens.

The children play in the garden of the neighbours.

‘The children are playing in the neighbours’ garden.’

b. \*De kinderen spelen in de tuin de burens.

\*The children play in the garden the neighbours.



(20) a. De fietsers waren erg moe geworden.

The cyclists were very tired become

(The cyclists had got/become very tired)

b. \*De fietsers was erg moe geworden.

\*The cyclists was very tired become

They were asked to choose which one of the pairs of sentences was a possible Dutch sentence.

This was performed in this way to be sure that they all understood the notion of possible and impossible sentences. For the monolingual Turkish participants, the following pairs of sentences were presented (21 a, b and 22 a, b). They were also read out loud.

(21) a. Ben iş-e her zaman araba-yla gid-er-im.

I work-DAT always car-COM<sup>6</sup> go-PRES-1<sup>st</sup>

‘I always go to work by car’

b. \*Ben iş-e her zaman araba gid-er-im.

I work-DAT always car go-PRES-1<sup>st</sup>

(22) a. Dün akşam yemeğ- i - ni teyze - m - de ye-di-k.

Yesterday evening meal-POSS-Acc aunt-1<sup>st</sup>SG-LOC eat-PAST-1PL

‘Yesterday we ate the evening meal at my aunt’s place’

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<sup>6</sup>COM=Comitative/Instrumental case. The comitative/instrumental case has approximately a similar meaning as the English preposition ‘with’. In (21a) it refers to the means of the action: ‘by car’. The absence of the comitative case leads to ungrammaticality as can be seen in (21b). The ungrammaticality in (22b) consists of the lack of the possessive suffix (-i) in the noun compound ‘akşam yemeğ- i’ and the lack of the accusative case (-ni) in ‘akşam yemeğ - i - ni’. Since ‘akşam yemeğ- i - ni’ is the object of the sentence, it has to be assigned the accusative case.

b. \*Dün akşam yemek teyze- m - de ye-di-k.

\* Yesterday evening meal aunt-1<sup>st</sup>SG-LOC eat-PAST-1PL

In this way they were trained to judge sentences as “possible” or “not possible”. For none of the groups was the term “grammatical” mentioned. After this introduction, the participants were told that they were

going to be asked to evaluate 32 English sentences using a scale from 1 (for a completely impossible English sentence) to 10 (for a highly possible English sentence). This scaling was used in order to give the subject enough freedom to evaluate these intuitions as precisely as possible when they were not 100% certain about in judgment. Their task was also explained in writing on the sheet that was presented to them. Finally, they were told that they could spend as much time as they needed to complete the study.

#### **4.5 Results**

The performance of all groups was analyzed for evidence of knowledge of the *That*-trace effect, *Subjacency* and *ECP*. A first analysis included all groups, a second was based on a stringent inclusion criterion, which resulted in the complete exclusion of the TM group. The analyses will be presented below in two separate subsections.

**4.5.1 I. Analysis – Results For All Subjects**

The ungrammatical sentences to be judged consisted of 1 *that*-trace effect sentence, 10 *Subjacency* violation sentences, and 6 *ECP* violation sentences. The average judgments of these sentences per group are summarized in Table 2<sup>7</sup>. (See Appendix C for individual mean scores).

*Table 2: Results of the TM, DM, and TDB groups (SD=Standart Deviation)*

		Mean acceptability judgment on 1-10 scale (10=good)			
group	<i>n</i>	That-trace effect (1 sentence)	Subjacency (10 sentences)	ECP (6 sentences)	Ideal native speakers response in all cases
TM	28	5.21 (SD= 2.96)	5.46 (SD= 1.48)	6.03 (SD= 1.49)	1
DM	34	5.97 (SD= 2.70)	2.70 (SD= 1.01)	3.25 (SD= 1.08)	1
TDB	44	4.91 (SD= 3.35)	2.68 (SD= 1.19)	2.97 (SD= 1.47)	1

The group averages show that the TDB group outperformed both the TM group and DM group for all these types of ungrammatical sentences, the *that*-trace effect, *Subjacency* and *ECP* sentences, often correctly judging these sentences to be impossible. An ANOVA revealed that the 3 groups differed significantly in their performance with ungrammatical sentences ( $p < 0.0000$ ). This was clearly due to the especially poor performance of the TM group on the *Subjacency* and *ECP* sentences. However, the TDB group also distinguished itself. For the *that*-

<sup>7</sup>The group average shown in Table 2 are actually averages of individual averages in the case of the 10 *Subjacency* sentences and the 6 *ECP* sentences.

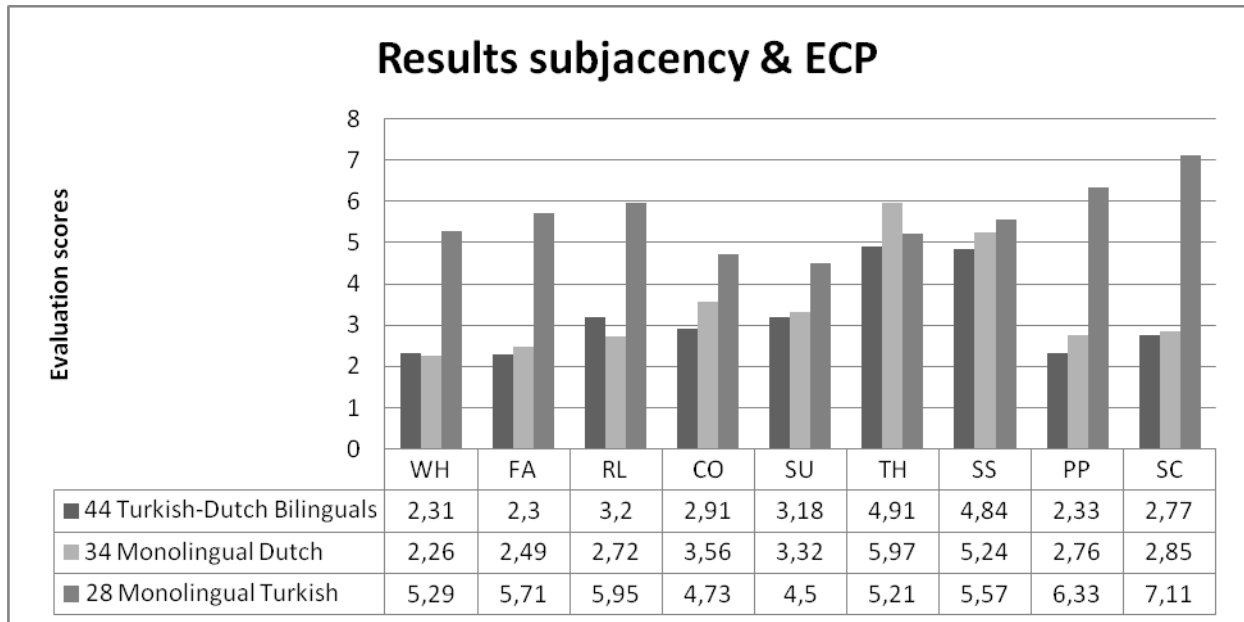
## The BECPH and L1 vs L2 Transfer Effects

trace sentences the average judgment of grammaticality on a scale from 1 to 10 was 4.91 for TDB, 5.21 for TM and 5.97 for the DM group. The *Subjacency* and *ECP* averages of the TDB group, 2.68 and 2.97, respectively, are approximately twice as accurate as those of the TM group, who averaged 5.46 for *Subjacency* and 6.03 for the *ECP*. This shows that the TM group differed significantly from the TDB and DM group with respect to *Subjacency* and *ECP*. They accepted the ungrammatical *Subjacency* and *ECP* sentences as grammatical much more often. However, a two-tailed *t* test showed that the averages of the *that*-trace effect of the TDB and DM groups were almost but not quite significant ( $t(76) = -1.5495, p \leq 0.1232$ ). The TDB and DM groups also did not differ significantly in the judgments of the *Subjacency* and *ECP* ( $t(76) = -0.0794, p \leq 0.9371$ ) and ( $t(76) = -0.3293, p \leq 0.3293$ , respectively). These insignificant values are also observable from the averages of the TDB and DM groups. The averages of the TDB group compared to the MD group are almost identical for *Subjacency* sentences, i.e. 2.68 for the TDB group and 2.70 for the DM group. The averages for *ECP* are also close. The TDB group averaged 2.97 and the DM group averaged 3.25.

To sum up, analysis of the group average judgments suggest no significant difference between the TDB group and DM group for the *Subjacency* and *ECP*, and *that*-trace effect sentences. Regarding the TM group, surprisingly, the TM group did slightly better than the DM group in the judgment of *that*-trace effect violations; however, the reason for this was probably that many students of the group were hyper-correcting. That is, they were correctly rejecting the ungrammatical sentences more often simply because of a general tendency to reject all WH-sentences, grammatical ones as well as ungrammatical ones. The performance of the TM group on the *Subjacency* and *ECP* sentences was significantly worse. A more detailed analysis of the *Subjacency* and *ECP* results are given for each group in Figure 4. The bars from left to right

represent the TDB, DM and TM groups, respectively, and the scores of each sentence type are presented below the bars.

Figure 4: Results on Subjacency and ECP of the TDB, DM and TM groups



WH = wh-islands, FA = factives, RL = relative clauses, CO = coordination, SU = superiority, TH = that-trace effect, SS = Sentential subject islands, PP = PP/ adverbial island, SC = specified subject constraint.

As expected, for almost all sentence types the TBD group was better than both the DM and TM groups, as predicted by the BECPH (see section 3.6). Among the exceptions are the complex NP types (WH-movement and relative clauses) in which the DM group outperformed the TBD group. However, the slight difference between the WH-movement and relative clause sentence types is not statistically significant. Furthermore, the difference between the TDB and DM groups for the That-trace effect sentences is almost but not quite significant ( $t(76) = -1.5495$ ,  $p \leq 0.1232$ ). Again this could be a result of the hypothesized extended critical period of the bilingual

students. In general the scores of the TDB and DM groups were twice as accurate as those of the TM group. As discussed in Section 2.1 and 3.6, the better performance of the TDB and DM groups vis-à-vis the TM group on *Subjacency* and *ECP* is evidence of positive transfer from Dutch to English.

#### 4.5.2 II. Analysis – Excluding the hyper-correcting students

For the second analysis, performance with the sentences used as controls was used as an inclusion criterion. This was done in an attempt to control the possible artifactual inflation of correct ungrammaticality judgments with ungrammatical sentences due to a general tendency to reject all sentences, good or bad, that had WH-movement. It was suspected that a “hypercorrection response bias” of this sort may have confounded the results for the TM group. The ungrammaticality judgments would only be valid if the subjects also performed well on the grammatical control sentences. However, the TM group performed poorly with grammatical sentences. The mean results of grammatical sentences that would be used as the inclusion criterion items, which consisted of the control sentences shown in (23), are presented below in Table 3.

- (23) a. *Who does John want to see?*  
b. *What did Sally ask her younger brother to look at?*  
c. *Where is the person that I want you to talk to?*  
d. *Who should I give the bracelet to?*  
e. *What did John think Carol wanted her mother to give to the postman?*  
f. *Which apple did Mary say it would be easy for us to cut?*  
g. *Which information would it be possible for Mary to persuade Susan to tell the reporters?*

Table 3: Results of the correct judgments of the control sentences (*SD*=Standard deviation)

<i>n</i>	Groups	Correct judgment (on 1-10 scale, 10=good) of Controls (7 sentences) <sup>8</sup>
28	Monolingual Turkish	5.95 ( <i>SD</i> =1.29)
34	Monolingual Dutch	7.01 ( <i>SD</i> =1.30)
44	Turkish-Dutch Bilinguals	6.32 ( <i>SD</i> =1.70)

Assuming that English native speakers would find these sentences fully grammatical, average group performance with them was not truly native speaker like for any of the groups. However, it was markedly worse for the TM group, who showed virtually chance performance. Since all the students might not have been at an advanced level, these results are not surprising. However, the monolingual Dutch had the best performance in the correct judgment of the control sentences. They were followed by the bilinguals and finally the monolingual Turkish. A closer look at the average acceptability judgments of the 3 groups revealed that they were performing poorly on the long movement items among the control sentences. This is not surprising, since Bley-Vroman *et al.* (1988) report that even native speakers had processing problems with these type of sentences in their study. For the poor judgment of a grammatical long-distance

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<sup>8</sup>Although a scale was used for native speakers grammaticality judgments are probably binary for the kinds of sentences tested here. Thus, a mean score of 50% is virtually chance performance.

## The BECPH and L1 vs L2 Transfer Effects

WH-movement sentence like ‘*Which information would it be possible for Mary to persuade Susan to tell the reporters?*’, they give the following explanation: the word ‘*information*’ as the object of *tell* in this sentence might be odd for some speakers, it is rather *give information* than *tell information*. Since even native speakers had difficulty with long/distance WH-movement sentences, these types of sentences were excluded from the calculations. In addition to the exclusion of these sentences, the test was made more stringent by establishing a criterion of a 7 or higher mean for the other control sentences to be included in the 2<sup>nd</sup> analysis. The reason for the setting 7 as the cut-off point was that 1-4 could be considered ungrammatical on a 1-10 point scale, 5-6 is an area where the subjects were ‘unsure’ of their replies (both numbers are the mid-point between 1 and 10) and finally the 7-10 range could be taken as a clear judgment of grammaticality. All students who met this inclusion criterion had a mean score of 7 or higher for the control items. Below in Table 4 are the results for these subsets of the samples. In total only 8 TM students met the inclusion criterion; however, 27 DM and 27 TDB students were included. As regards performance on the control items, the bilinguals showed the best performance followed by the DM group and lastly the TM group.

*Table 4: Results of the mean score of the students who passed the more stringent test*

<i>n</i>	Groups	Correct judgments of the subset of control items (4 sentences)
8	Monolingual Turkish	8.09 ( <i>SD</i> =0.88)
27	Monolingual Dutch	8.62 ( <i>SD</i> =0.87)



27	Turkish-Dutch Bilinguals	8.86 ( <i>SD</i> =1.05)
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The stringent inclusion criterion removed a great many subjects from the study, virtually all of the TM group. The average acceptability judgments of the *That*-trace effect, *Subjacency* and *ECP* correct judgments of ungrammatical sentences were calculated. Table 5 shows the results of the correct judgment of the ungrammatical sentences of the three groups.

*Table 5: Results of the L1 Turkish Monolinguals (TM ), L1 Dutch Monolinguals (DM) and Turkish Dutch Bilinguals (TDB) correct judgment of ungrammatical sentences.*

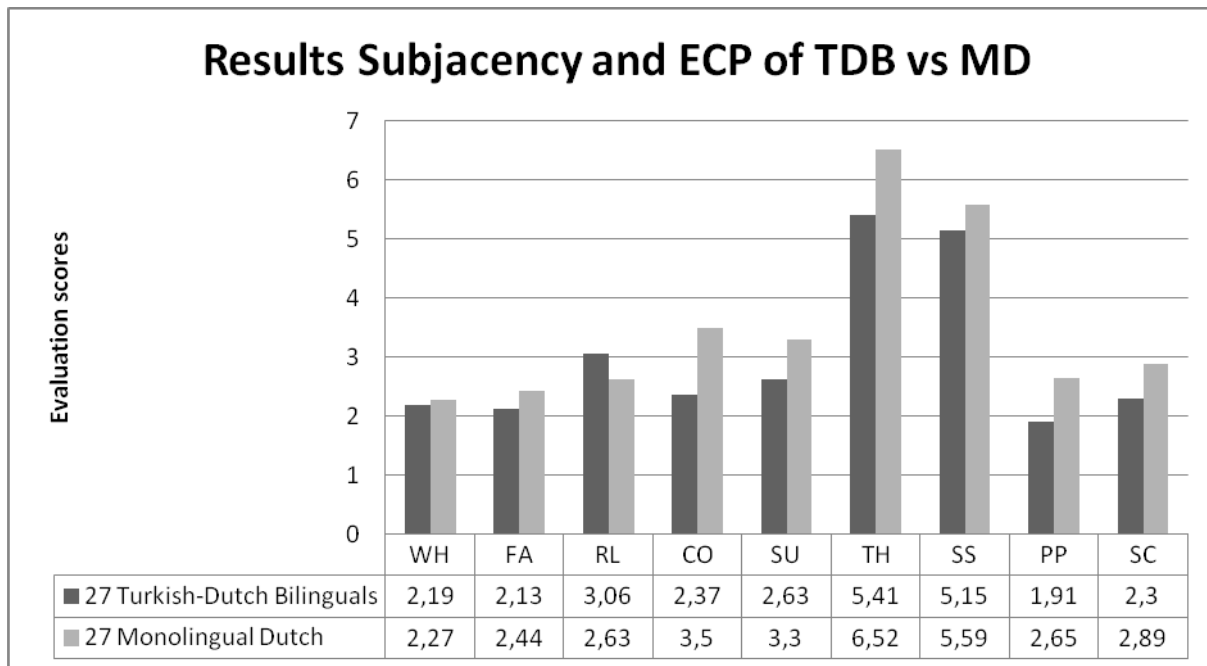
<i>n</i>	<b>That-trace effect</b>	<b>Subjacency</b>	<b>ECP</b>
<b>8 TM</b>	6.13 ( <i>SD</i> =3.04)	6.28 ( <i>SD</i> =1.65)	6.56 ( <i>SD</i> =1.19)
<b>27 DM</b>	6.52 ( <i>SD</i> =2.68)	2.66 ( <i>SD</i> =1.10)	3.29 ( <i>SD</i> =1.14)
<b>27 TDB</b>	5.41 ( <i>SD</i> =3.61)	2.45 ( <i>SD</i> =1.18)	2.64 ( <i>SD</i> =1.35)

The number of subjects of the TM group, which is 8, is not enough to make a proper comparison group with other groups. For this reason, the results of the TM group – though as predicted by the hypothesis – will not be taken into account. A two-tailed *t* test showed that the averages of the *that*-trace effect of the TDB and DM groups were not significant ( $t(52) = -1.2845, p \leq 0.2032$ ). The TDB and DM groups also did not differ significantly in the average acceptability

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judgments of *Subjacency* ( $t(52) = -0.6791, p \leq 0.5008$ ), but there was a marginally significant difference in the average acceptability judgments of *ECP* ( $t(52) = -1.9415, p \leq 0.0535$ ). This marginally significant difference can be accounted for by the Bilingual Extended Critical Hypothesis (BECPH). The scores of each section of the *Subjacency* and *ECP* sentences of both TDB and DM groups will be presented in detail in Figure 5 below. The bars and the numbers represent the scores of all the students who passed the stringent test. 27 students of each group passed the test.

Figure 5: Results of the TDB and DM group passing the stringent test



WH = wh-islands, FA = factives, RL = relative clauses, CO = coordination, SU = superiority, TH = that-trace effect, SS = Sentential subject islands, PP = PP/ adverbial island, SC = specified subject constraint.

## **5 Discussion**

This thesis tested two hypotheses: (1) the Bilingual Extended Critical Period Hypothesis (BECPH), (2) the second hypothesis consisted of two sections; the first section examined whether there is any transfer from L1 to L2 by Turkish and Dutch monolinguals, the second section was a replication of the 4 hypotheses in the Bardel & Falk (2007) study. Along with the discussion of these hypotheses, the results will also be compared to the proposals of other studies mentioned in the previous sections. Firstly, the discussion will start with the BECPH related to the empirical findings. Secondly, the L1 to L2 and L1/L2 to L3 transfer will be discussed according to the empirical results in this study.

### **5.1 The Bilingual Extended Critical Period Hypothesis (BECPH)**

Results of the English L2/L3 acquisition of WH-movement by Turkish monolingual, Dutch monolingual students and Turkish-Dutch bilinguals (TDB) suggests that the age of learning a subsequent language is important and influences the learning of another subsequent language. By knowing the Dutch language, acquired at an early age (approximately age 4), the TDB group (the ‘early learners’ of a subsequent language) showed similar positive transfer effects from Dutch to English as the DM group did. On the other hand, the relative ‘late learners’ of a subsequent language, i.e. the monolingual Dutch and the monolingual Turkish group in this study performed in general less well than the TDB bilinguals on the *ECP* sentences. These differences in performance of the monolinguals and bilinguals suggest that learning a subsequent language at an earlier age extends the critical period for learning languages, as is observed from the results. Second language learning starts at an earlier age by bilinguals and this triggers the extension of the “plasticity” in the brain, thus the extended critical period for the bilinguals. This suggests that

the “plasticity” of the brain will endure longer for bilinguals. The hypothesized critical period functions in section 3.6 illustrates this and gives an approximate sketch for the critical period of the ‘late learners’, in this study the monolingual groups, and the ‘early learners’, the TDB group. The slope in the function critical period of the bilinguals is longer and less steep in duration than the monolinguals. The outperformance on the grammaticality judgment task on *ECP* by the TDB group supports the BECPH. Especially the average acceptability judgments of the *ECP* clearly show the relation between higher performance and early experience in language learning.

### **5.2 Transfer effects L1 to L2**

As expected, subjects whose L1 was Turkish performed significantly worse on the grammaticality judgment test than the subjects whose L1 was Dutch. Dutch and English share similar language properties, whereas Turkish behaves differently as regards WH-questions. WH-movement in Turkish does not occur in the overt syntax, while in Dutch and English it does. This was due to negative transfer effect from Turkish to English, and positive transfer effect from Dutch to English. In other words, the typological similarities between the native and the target languages had an impact on the results. Thus, among other things, the results provide additional evidence of the effect of typological similarity and this is in line with the empirical studies of many researchers (e.g. Bialystok & Miller 1999, Bongaerts 1999, Cranshaw 1997, Kellerman 1995, Sorace 1993 and van Wuijtswinkel 1994). This result did not support the non-transfer hypothesis, because there indeed was transfer (either positive or negative) from the previously acquired languages, which influenced the results to an important extent. The performance of both monolingual subject groups differed significantly. Moreover, even though the TM group was all girls (which would have biased things in favor of grammatical performance), they

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nonetheless were outperformed by the DM and TDB groups. The Dutch group who consisted of boys and girls performed twice as well on all the components of the test. This suggests that transfer is stronger than the gender factor. The private and extra English courses of some monolingual Turkish subjects also did not have any effect on the overall results compared to the results of the DM and TDB group. Another factor which did not influence the results was the approximate 8 years of English by the TM group versus the approximate 7 years of English by the DM group. As noted above, similarities in language typology seem stronger than other factors. However, the quality and quantity of linguistic input and the methods, techniques and strategies used in the educational systems might also have influenced the results. For example, there might be differences in the teaching methods and the quality and quantity of the target linguistic input used by teachers of both countries. In principle, such factors may have affected the results.

### **5.3 Transfer effect L1/L2 to L3**

In this section the four hypotheses adopted from the study of Bardel and Falk (2007) will be discussed. The first hypothesis was the non-transfer hypothesis. The difference particularly between the TM group and the two other groups, DM and TDB, was significant. The claim of the second hypothesis was whether there would be any L1 transfer effects. And indeed as stated above there were positive as well as negative transfer effects in the case of the monolingual learners. Negative transfer occurred from the Turkish language and positive transfer occurred from the Dutch to the English language. Typological language differences seem to have negative impact on second language acquisition, whereas typological similarities facilitate learning a second language. Regarding the TDB group, there were not any L1 transfer effects. Their test

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results were in the same line as the test results of the MD group, and not the TM group. This, in fact, supports the L2 transfer hypothesis. The L2 of the TDB subjects played an important role in the English L3 acquisition. Positive L2 transfer effects from Dutch to English occurred in all test sentences, i.e. *Subjacency* and *ECP* sentences. These results are consistent with the Barkel & Falk (2007) and Falk and Bardel (2011) studies in that there is transfer from L2 to L3. Moreover, their studies also demonstrated that the similarities in typology of the L1 and L3 did not have any impact on the L3 acquisition. In both studies they conclude the importance of the ‘L2 status factor’, L2 influences the L3 either positively or negatively. The final transfer hypothesis was transfer according to the Cumulative Enhancement Model (CEM). This model suggests that any previous learned language will have influence on the subsequent language to be learned and the L2 will only supersede L1 if the L3 properties are not present in the L1. This study confirmed the CEM. The previous knowledge of the WH-movement in L2 Dutch facilitated the acquisition of the WH-movement in L3 English, because of the absence of the WH-movement in Turkish transfer occurred from L2 to L3.

## 6 Conclusion

In a nut shell, this master thesis has examined the acquisition of WH-movement of English as L2 or L3 to support the Bilingual Extended Critical Period Hypothesis (BECPH), and the four hypotheses adopted from the Bardel and Falk (2007) study. The four hypotheses were the non-transfer hypothesis, the L1 transfer hypothesis, the L2 transfer hypothesis and the *Cumulative Enhancement Model* (CEM). To test these hypotheses a grammaticality judgment test was used. Among many possible factors, it is reasonable to assume that the results support the BECP hypothesis, since the TDB group outperformed both the TM and DM groups on the ECP

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sentences. The outperformance of the TDB over DM group on ECP sentences was marginally significant. The prediction that the bilinguals would outperform the monolinguals on the *That*-trace effect sentences was almost but not statistically significant. With the participation of more subjects in future studies the results might become statistically significant. Moreover, as stated in section 3.6, the BECPH also predicts that simultaneous bilinguals would show the same performance as monolinguals, since they started to acquire two languages from birth. This prediction is different from the “mega-linguistic awareness” account which predicts the additive effects of bilingualism (in general) on L3 acquisition and it does not make any difference between balanced and successive bilinguals. In the future, the BECPH could be tested with a group of simultaneous bilinguals and successive bilinguals to see whether the simultaneous bilinguals show performance similarities to monolinguals. Furthermore, the differences in L1 language typology had significant influences on the results. The presence of the WH-movement in L1 or L2 facilitated the L3 acquisition, thus positive transfer effects were obtained. In the absence of the WH-movement, however, the effects of negative transfer were observed, as in the case of L1 Turkish. The results were not compatible with the non-transfer hypothesis. Only the results of the DM group supported the L1 transfer hypothesis. The results were also compatible with the L2 transfer hypothesis and the CEM. Finally, the limitation of this study in this thesis is that the socio-economical status of the families was not taken into account. Another limitation is that the amount and quality of input of the languages have not been measured. This study could also be performed with bilinguals whose first language involves WH-movement and whose second language does not, and see whether there will be transfer effects from L1 to L3.

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## Appendix A

### The English version of the questionnaire.

#### Answer the following questions.

1. Do you read English books/magazines/newspapers etc.?  
never      sometimes      often      always
2. Do you watch English TV channels?  
never      sometimes      often      always
3. Do you listen to English music?  
never      sometimes      often      always
4. Do you play English computer games?  
never      sometimes      often      always
5. Did you have English classes at primary school?  
never      sometimes      often      always
6. Do you take private courses for English?  
never      sometimes      often      always
7. Do you attend for extra/supportive courses?  
never      sometimes      often      always

### The Turkish version of the questionnaire.

#### Aşağıdaki soruları size en uygun şekilde yanıtlayınız.

1. İngilizce kitap/dergi/gazete v.b. okur musun?  
a) asla      b) bazen      c) sık sık      d) her zaman

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2. İngilizce TV programı izlemisin?  
a) asla    b) bazen    c) sık sık    d) her zaman
3. İngilizce müzik dinler misin?  
a) asla    b) bazen    c) sık sık    d) her zaman
4. İngilizce bilgisayar oyunu oynuyor musun?  
a) asla    b) bazen    c) sık sık    d) her zaman
5. İlkokulda İngilizce dersi gördün mü?  
a) asla    b) bazen    c) sık sık    d) her zaman
6. İngilizce özel ders alıyor musun?  
a) asla    b) bazen    c) sık sık    d) her zaman
7. Dershaneye (ingilizce için) gidiyor musun?  
a) asla    b) bazen    c) sık sık    d) her zaman

### **The Dutch version of the questionnaire.**

#### **Beantwoord de volgende vragen.**

1. Lees je Engelse boeken/tijdschriften etc.?  
a) nooit    b) soms    c) vaak    d) altijd
2. Kijk je naar Engelse TV zenders?  
a) nooit    b) soms    c) vaak    d) altijd
3. Luister je naar Engelse muziek?  
a) nooit    b) soms    c) vaak    d) altijd
4. Speel je Engelse computerspelletjes?  
a) nooit    b) soms    c) vaak    d) altijd

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5. Had je Engels op de basisschool?

- a) nooit      b) soms      c) vaak      d) altijd

7. Krijg je privé les voor Engels?

- a) nooit      b) soms      c) vaak      d) altijd

8. Krijg je Engels bijles?

- a) nooit      b) soms      c) vaak      d) altijd

## Appendix B

### All test sentences:

#### Subjacency

Wh- islands

- 9 \*What does Mary want to know whether John has already sold?
- 10 \*What does Tim wonder where Nancy put?
- 11 \* Where did Bill want to know who put the book?

Complex NP's

##### a. Factives

- 12 What did Bill think that the teacher had said?
- 13 What did John realize he could not sell?
- 14 \* What did Sam believe the claim that Carol had bought?
- 15 \* What did John hear the news that the mayor would do?

##### b. Relative clauses

- 16 \*Who did John buy the house that had recommended to him?
- 9. \* Where did Bill visit a friend who had just arrived from?
- 10. \* What did the police arrest the men who were carrying?

Coordination

- 11. \*What did John find the ball and?
- 12. \*What does John like to eat tomatoes and?

### ECP

Subject/Object Asymmetries

##### d. Superiority

- 13. I can't remember who did what.
- 14. \*She forgot what who said.

##### e. That-trace Effect

- 15. What did Frank say that Judy would like to read?

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16. Who did Ellen say Max thought would pass the test?
17. \*What did John say that would fall on the floor, if we're not careful?

### f. Sentential Subject Islands

18. What kind of book is it necessary to read?
19. \*What sort of food is to digest easy?

### PP/Adverbial Islands

20. Which bed does John like to sleep in?
21. \*What time will Mary arrive before?
22. \*What did Albert put money in the box during?
23. \*What does John eat hamburgers because he likes?

### Specified Subject Constraint

24. What did Mike see pictures of?
25. \* What did Mary hear Bill's stories about?

### **Sentences used as controls**

#### Who/Whom

26. Who does John want to see?
27. Who should I give the bracelet to?

#### Long Movements

28. What did John think Carol wanted her mother to give to the postman?
29. Which apple did Mary say it would be easy for us to cut?
30. Which information would it be possible for Mary to persuade Susan to tell the reporters?

#### P-Stranding

31. Where is the person that I want you to talk to?
32. What did Sally ask her younger brother to look at?

Name:

Age:

School/ Class:

**Circle the number which according to you gives the best evaluation of the sentence. Evaluate (1) for being an 'impossible', (2) for being a 'less impossible' English sentence etc., and (10) for being a 'possible', (9) for being a 'less possible' etc. English sentence.**

1. What did Bill think that the teacher had said?

1 2 3 4 5 6 7 8 9 10

2. What does Tim wonder where Nancy put?

1 2 3 4 5 6 7 8 9 10

3. Who does John want to see?

1 2 3 4 5 6 7 8 9 10

4. Where did Bill want to know who put the book?

1 2 3 4 5 6 7 8 9 10

5. What does Mary want to know whether John has already sold?

1 2 3 4 5 6 7 8 9 10

6. What did Sam believe the claim that Carol had bought?

1 2 3 4 5 6 7 8 9 10

7. What did John realize he could not sell?

1 2 3 4 5 6 7 8 9 10

8. What did John hear the news that the mayor would do?

1 2 3 4 5 6 7 8 9 10

9. Who did John buy the house that had recommended to him?

1 2 3 4 5 6 7 8 9 10

10. What does John eat hamburgers because he likes?

1 2 3 4 5 6 7 8 9 10

11. Where is the person that I want you to talk to?

1 2 3 4 5 6 7 8 9 10

12. Where did Bill visit a friend who had just arrived from?

1 2 3 4 5 6 7 8 9 10

13. Who should I give the bracelet to?

1 2 3 4 5 6 7 8 9 10

14. What did the police arrest the men who were carrying?

1 2 3 4 5 6 7 8 9 10

15. What did John find the ball and?

1 2 3 4 5 6 7 8 9 10

16. What does John like to eat tomatoes and?

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1 2 3 4 5 6 7 8 9 10

17. I can't remember who did what.

1 2 3 4 5 6 7 8 9 10

18. She forgot what who said.

1 2 3 4 5 6 7 8 9 10

19. What did Frank say that Judy would like to read?

1 2 3 4 5 6 7 8 9 10

20. What did John say that would fall on the floor, if we're not careful?

1 2 3 4 5 6 7 8 9 10

21. Who did Ellen say Max thought would pass the test?

1 2 3 4 5 6 7 8 9 10

22. What did John think Carol wanted her mother to give to the postman?

1 2 3 4 5 6 7 8 9 10

23. What kind of book is it necessary to read?

1 2 3 4 5 6 7 8 9 10

24. What sort of food is to digest easy?

1 2 3 4 5 6 7 8 9 10

25. Which bed does John like to sleep in?

1 2 3 4 5 6 7 8 9 10

26. What did Albert put money in the box during?

1 2 3 4 5 6 7 8 9 10

27. Which apple did Mary say it would be easy for us to cut?

1 2 3 4 5 6 7 8 9 10

28. What time will Mary arrive before?

1 2 3 4 5 6 7 8 9 10

29. What did Mike see pictures of?

1 2 3 4 5 6 7 8 9 10

30. What did Mary hear Bill's stories about?

1 2 3 4 5 6 7 8 9 10

31. Which information would it be possible for Mary to persuade Susan to tell the reporters?

1 2 3 4 5 6 7 8 9 10

32. What did Sally ask her younger brother to look at?

1 2 3 4 5 6 7 8 9 10

Appendix C

**Mean results of all students for all types of sentences**

**Group:** 0=TM (Turkish monolinguals) 1= DM (Dutch monolinguals) 2=TDB (Turkish-Dutch Bilinguals)

**Sex:** 0=girls 1=boys

**Type:** 0=included by stringent test 1= excluded by stringent test

Participants	n	Group	Age	Sex	That trace effect (1)	Mean ECP (6)	Mean Subjacency (10)	Controls (7)	Controls excluding long movement sentences (4)	Type (stringent test)
1	1	0	16	0	5	6.5	4.9	5.3	4.8	1
2	2	0	17	0	8	2.8	4	5.3	3	1
3	3	0	17	0	1	7	4.1	6	6	1
4	4	0	17	0	3	6.7	6.3	6.1	6.8	1
5	5	0	17	0	7	5	5.6	5.1	5.5	1
6	6	0	17	0	4	3.3	6.2	5.1	6	1
7	7	0	16	0	10	7	6.4	7.1	6.8	1
8	8	0	16	0	8	6.1	5	7.7	8.5	0
9	9	0	16	0	5	6.7	4.7	5.85	6	1
10	10	0	16	0	3	5.3	7.5	7	6.8	1
11	11	0	17	0	3	6.2	8	7.4	8.5	0
12	12	0	16	0	7	8	6.1	7.9	8.5	0
13	13	0	16	0	10	6	4	3.7	3.3	1
14	14	0	16	0	8	4.3	6.9	5.7	7	0
15	15	0	16	0	3	5.5	4.8	5	5.8	1
16	16	0	16	0	9	8	8.1	8.3	8.8	0
17	17	0	15	0	2	5.8	4.7	4.6	5.5	1
18	18	0	17	0	3	6.2	7.8	5.4	6	1
19	19	0	16	0	4	6.3	7	6.8	7.3	0
20	20	0	16	0	9	2.8	2.9	4.6	5.3	1
21	21	0	16	0	5	5	4.5	6.6	6.8	1
22	22	0	17	0	2	9	3.4	4.7	4.8	1
23	23	0	16	0	3	4.7	4.9	6	5.5	1
24	24	0	16	0	3	7.2	4.9	3.3	3.8	1
25	25	0	16	0	9	7.2	6	8.3	9.3	0
26	26	0	16	0	9	7.5	6.8	6.4	5.8	1
27	27	0	16	0	1	6.3	3.1	5.4	7	0
28	28	0	17	0	2	6.3	4.4	5.7	5.8	1
29	1	1	17	1	8	5.8	4.7	8	10	0
30	2	1	17	1	6	4.3	3.2	6.6	7	0
31	3	1	18	0	7	3.2	2.9	8	8.5	0
32	4	1	17	0	3	2.7	3	5.1	6.3	1
33	5	1	17	0	3	2	2.3	5.1	6.3	1



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34	6	1	16	0	9	5.2	4.6	7.4	8.8	0
35	7	1	16	1	7	3.5	3.1	8.4	9	0
36	8	1	17	1	5	2.7	3.3	5.9	8.3	0
37	9	1	17	1	2	2.5	2.2	4.3	4.8	1
38	10	1	16	0	10	3.8	3.8	7.7	9.5	0
39	11	1	17	1	6	4.2	3.8	4.7	5	1
40	12	1	16	0	4	4	3	5	5.5	1
41	13	1	18	0	3	3.8	3.3	5.1	5.5	1
42	14	1	16	1	6	3.7	4	7.1	8.8	0
43	15	1	16	0	7	1.8	2.7	8	9.5	0
44	16	1	17	1	8	4	2.4	8	9.3	0
45	17	1	16	1	7	3.7	1.8	8.1	9.5	0
46	18	1	16	0	10	3.5	3.8	7.6	9.3	0
47	19	1	16	0	9	4.2	3.9	7.3	9	0
48	20	1	16	0	6	2.3	2.3	5.3	6	1
49	21	1	16	0	9	3.3	2.8	8.9	10	0
50	22	1	17	0	9	2	2.1	8.1	9	0
51	23	1	16	1	7	3	2.5	5.4	7	0
52	24	1	16	1	9	4.5	1.6	7.6	8.5	0
53	25	1	15	1	9	2.8	1.8	7.4	8	0
54	26	1	16	0	8	4.5	3.4	8.1	10	0
55	27	1	17	1	3	2.7	2.1	6	7.3	0
56	28	1	18	0	8	1.2	1	8.7	9.8	0
57	29	1	16	0	4	4.7	3.1	7.7	9.3	0
58	30	1	17	0	2	2.3	1.4	7.3	8.5	0
59	31	1	16	0	2	2	1	7.9	9.8	0
60	32	1	16	0	2	2	1	7.9	9.8	0
61	33	1	16	0	2	2.2	1	7.9	9.8	0
62	34	1	16	1	3	2.3	2.8	6.7	9	0
63	1	2	16	0	7	5	5.1	6.4	6.5	1
64	2	2	18	0	4	3.5	2.3	7.7	8.8	0
65	3	2	17	1	6	4.3	3.8	7.9	9.5	0
66	4	2	18	1	1	2.5	3.8	8.7	10	0
67	5	2	19	0	5	5.2	2.8	3.9	4.5	1
68	6	2	17	0	7	3.7	3.6	5.6	6.8	1
69	7	2	17	0	4	2.2	2.6	8.7	10	0
70	8	2	16	1	5	1.2	2.4	5.7	7.5	0
71	9	2	16	1	4	3.1	3.1	3.6	4	1
72	10	2	16	0	10	1.8	1.2	8.1	9	0
73	11	2	16	0	10	7	4.9	9	9.8	0
74	12	2	17	1	3	1.3	1	1	8.8	0
75	13	2	17	1	7	3.8	5.2	7.4	8.3	0
76	14	2	16	1	4	4.8	4.7	5.6	5.3	1
77	15	2	16	1	1	2	1.9	7	10	0
78	16	2	17	1	4	4.5	3.6	7.1	8.5	0
79	17	2	16	0	10	1.5	1	8.1	9	0
80	18	2	16	1	1	1.8	3.4	6.9	7.8	0
81	19	2	17	1	10	4	1.3	9.1	10	0

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82	20	2	16	1	1	1	1.9	6.1	10	0
83	21	2	17	1	6	6.8	3.3	4.3	3.3	1
84	22	2	17	1	4	4	3.4	4.1	5	1
85	23	2	18	1	2	4.2	3.8	5.3	6	1
86	24	2	17	1	10	2.5	1.7	7.7	10	0
87	25	2	17	0	9	2.8	2.3	9.4	10	0
88	26	2	16	1	3	3.7	2.9	6.1	7	0
89	27	2	17	1	2	1.5	1.7	3.9	4.5	1
90	28	2	16	1	2	2.2	2.1	3.4	3.5	1
91	29	2	17	0	2	3.2	2	4.3	4.5	1
92	30	2	16	0	2	3	2.5	5	6.5	1
93	31	2	17	0	1	2.5	2.1	6	9.5	0
94	32	2	17	0	3	2.2	3.4	5.9	7.8	0
95	33	2	18	0	10	2.5	3.9	8.3	10	0
96	34	2	17	0	1	2.3	2.1	6.1	9.8	0
97	35	2	18	1	1	1	1	4.4	4.5	1
98	36	2	16	0	2	1	1.4	7	7.8	0
99	37	2	17	1	3	1	1.7	5.6	8	0
100	38	2	17	0	10	1.2	2	8.1	6.8	1
101	39	2	17	1	9	3.2	1.2	7.3	8	0
102	40	2	16	1	9	3.2	1.2	7.1	7.8	0
103	41	2	16	1	9	2.8	3.3	5	5.3	1
104	42	2	18	1	2	4.3	2.6	4.1	2.8	1
105	43	2	17	1	9	1.8	1.9	6	7	0
106	44	2	17	0	1	3.3	4.7	3.7	4.3	1