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A study of school-age Moroccan children in the Netherlands

Petra Bos

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Development of bilingualism

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Development of bilingualism

A study of school-age Moroccan children in the Netherlands

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1 INTRODUCTION

1.1 BILINGUALISM

In most societies multilingualism in terms of mastering more than one language is regarded as an asset. For purposes of international business, travelling, cultural awareness, reading international literature and many others, most people are positive towards learning one or more other languages besides their mother tongue. It becomes a totally different matter when people are forced to learn a new language, for example when they move to a country where their mother tongue is not spoken by a majority of the people and therefore has a low status. To survive in this new society, adults will have to learn a new language after already having completed the process of learning their first language. They will become bilinguals. Their children will have to learn their mother tongue and the dominant language of the society at the same time. They will grow up bilingually.

Large groups of people who have moved to countries where their mother tongue does not have a high status, have emigrated for economic reasons and therefore usually do not belong to groups with a high socio-economic status. We have seen from studies on second language acquisition by adults with a low socio-economic status (for example, Broeder 1991) in the Netherlands, that they usually do not reach a very high proficiency level in their second language (L2). They fossilize rather quickly at a level that provides them with the basic knowledge they need to execute their jobs and to survive in Dutch society. Their children, however, will (have to) participate in the Dutch school system, and therefore will (have to) reach a higher level of proficiency in their L2 than their parents. They are also in need of a high level in their first language (L1) because of family relations, cultural relations and, generally, keeping in touch with their roots.

In the Netherlands, these children are often seen as linguistically deprived because their Dutch is not on the same level as that of their Dutch peers. A 6-year-old Moroccan child who can express itself both in Moroccan Arabic and in Dutch does not receive any applause because its proficiency in these languages is not exactly the same as that of a monolingual peer of each of these languages, whereas by the time a Dutch child learns his first words of English, usually

around the age of 10, the people around him beam with pride. Is the language proficiency of bilingual Moroccan children in the Netherlands really so bad that it justifies this attitude? Or is it that in our Western society languages such as English have a much higher status than, say, Arabic does, and that therefore the language proficiency of speakers of the former is automatically valued higher than that of speakers of the latter?

The focus of this study was the bilingual development of young language learners. The objective was to determine whether their language development is indeed as different from that of monolingual language learners as is often presumed. For this purpose, we have studied the language development of a group of children aged 4 to 10 who speak Moroccan Arabic as their first language and Dutch as their second language. In research much attention has been paid to pre-school first language development and to the process adults go through when they learn a second language. *Bilingual* development at *school age* is a topic that has so far received relatively little attention.

We focused on spoken language because these children are not familiar with using their home language in a written form. We studied the way the two languages develop simultaneously. In order to be able to analyse their language development, we asked the children to perform a number of experimental language tasks and to retell picture stories several times with fixed intervals.

The bilingual development we talk about in this study is common to many ethnic minority children in the Netherlands. The parents of these children have a native language (in the case of Moroccans: Moroccan Arabic or Berber) that differs from the dominant language in this country (Dutch). In the case of Moroccans, the native languages of the parents may also differ from each other (one parent speaking Moroccan Arabic and the other Berber).

After short introductory talks with the children, we made sure that all informants were arabophones, i.e. none of the children who took part had parents who spoke Berber. This was done in order to keep the group as homogeneous as possible. Assuming that parents speak their native language with their children, this means that the informants whose language development we studied, had language input from *one* language at home and from *another one* abroad and at school.

1.2 STUDIES ON LANGUAGE DEVELOPMENT AT SCHOOL AGE

With regards to studies on language development in children, a distinction can be made between research that focuses on *grammatical competence* and research that focuses on *pragmatic competence*. The first type of research aims at investigating how children learn to master the grammatical rules of a language. Grammatical rules apply to a number of domains of language acquisition, such as phonology,

morphology, and syntax. Research on pragmatic competence usually focuses on how children learn to express themselves in such a way that their message is correctly understood by the listener: using words in the right context, situating events on the correct spot on the time axis and establishing the correct relations between different actors in a (spoken or written) text. The focal areas of study within these two domains of research will be addressed.

1.2.1 Grammatical competence

The distinction between two types of anaphora (bound and free) that will be made in the chapter on anaphoric reference, refers to different principles in Chomsky's standard binding theory (1981). In a variety of studies, the acquisition of lexical anaphors and pronouns was studied in languages such as English and Dutch. In Koster's (1988a) research, a fast pattern of acquisition of bound anaphors could be evidenced. It seems that syntactic knowledge of one of Chomsky's principles, as part of universal grammar, is guiding the development. In a number of studies, the acquisition of anaphoric reference was studied in languages that are typologically very different from English. From a cross-linguistic point of view, those languages which have binding principles that are distinct from English are of special interest, because these languages seem to challenge Chomsky's claims.

There is a large body of literature on the processing of relative clauses in various unrelated languages. Hakuta (1981) studied the acquisition of relative clauses in Japanese. By contrasting *sov* (subject-object-verb) and *ovs* (object-verb-subject) word orders in the main clause, Hakuta focused on the role of the position of embedding. He found it was not center-embedding that caused processing problems for his informants, but rather the stacking of nouns before the main verb. Slobin (1986) compared the acquisition of relative clauses in Turkish and English. He found relative clauses in Turkish to be much more complex for children as a consequence of the deformation of the embedded clause which loses the finite verb and normal case inflections of a canonical main clause. MacWhinney & Pléh (1988) investigated the acquisition of relative clauses in Hungarian. They found evidence for the importance of *focus* in the main clause and the relative clause.

1.2.2 Pragmatic competence

Bamberg (1987) examined how German-speaking children in the age group 3-10 establish reference to two main characters in a picturebook story. It was found that the youngest children, as well as some of the children of the intermediate age group (6-7 years) followed a global anaphoric strategy by matching the main protagonist of the story with the third person pronoun, irrespective of whether reference to this character is maintained or reintroduced into the narrative. In a

more advanced stage of development, a more adultlike anaphoric strategy was followed by the children, in which nominal expressions are used for the reintroduction of characters, and pronouns for the maintenance of characters. According to Bamberg, the reorganization of children's devices for text cohesion involves progress from a global system referring to the text as a whole to a more locally based system in which both the text as a whole and the immediate discourse environment are taken into account.

Karmiloff-Smith (1981, 1985) investigated the acquisition of discourse devices in English and French with children in the 4-9 age range. Her results showed a developmental sequence of three stages. At stage 1, nominal referential devices were used in their deictic function, often even at first mention of a referent. In the case where protagonists were first referred to with an indefinite pronoun, they were pronominalized afterwards. At stage 2, new referents were introduced with indefinite referring expressions, pronouns functioned anaphorically and the subject slot of all sentences was pre-empted for reference to the main protagonist only. The third stage differed from the second stage in that the subject slot of sentences was no longer rigidly pre-empted for reference to the main protagonist.

Verhoeven (1988) studied the devices for anchoring discourse cohesion in Turkish narratives of 5- and 7-year-old children in Turkey. The narrative production of the younger group turned out to be chiefly composed of deictic markers referring to the extralinguistic context. Moreover, these children mostly matched protagonists in the story with a demonstrative pronoun or with agreement on the verb, irrespective of whether these characters were introduced or reference to these characters was maintained. The stories produced by the older children were marked by a predominance of nominal forms for reference shift and anaphoric forms for reference maintenance.

Hickmann (1991) studied the acquisition of cohesive devices in narratives of English, French and Chinese speaking children in the age range 4-10. She found that universal functional principles play a role in how all children learn to use referential devices in narratives. According to Hickmann, these universal principles involve interactions among intrasentential properties of referring expressions, such as the referential content or the propositional role within clauses, and intersentential properties, particularly the degree to which referents are presupposed across clauses. However, the linguistic means for the establishment of narrative cohesion show great variation across languages. Hickmann made it clear that the extent to which the particular cohesive devices of particular languages may affect the aquisition of narrative cohesion can only be determined by means of cross-linguistic comparison.

Schiffrin (1981) and Fleischmann (1985) showed that the use of present tense to refer to past events (historical present) and past tense in narratives is alternated in a regular way. They concluded that the organization of a narrative

delimits the domain in which the historical present can occur, and that various structural and functional constraints determine switches between the two tenses. Wallace (1982) showed that present tense (vs. non-present) and perfective aspect (vs. imperfective) supply the main points or the foreground in narratives. Klein & Von Stutterheim (1987) proposed that the foreground in narratives is characterized by the conditions of topic and focus which constrain the temporal features of referential movement.

With respect to the acquisition of linguistic means for temporal reference, Clark (1971) claimed that two principles account for the use of temporal clauses. The first principle (*order-of-mention*) states that if there are two subsequently related events, the one referring to the earlier event is mentioned first. According to the second principle (*derivational simplicity*), juxtaposition of two main clauses is preferred over complex right-branching constructions, and even more over complex left-branching constructions.

Weist (1986) showed that the opposition between present/non-present is developed first, and that past tense marking is primarily acquired in redundant contexts. Von Stutterheim (1986) studied the acquisition of temporality in L2 German by adult Turkish workers. She found that tense first indicated aspectual distinctions before it was used deictically. The repertoire of temporal expressions appeared to differentiate gradually in respect to temporal distance.

1.3 LINGUISTIC RESEARCH ON ETHNIC MINORITIES IN THE NETHERLANDS

In the '60s and '70s, during a period of economic growth, Dutch employers encouraged large groups of Mediterranean men to come to the Netherlands in order to fill the (temporary) vacancies in factories and in agriculture. This period of economic migration was then followed by a period of social migration, involving the immigration of women and children in the '70s and '80s. In 1983, the Dutch government published a Minorities Report (Minderhedennota, 1983), which stated that members of ethnic minorities living in the Netherlands would be accepted as permanent inhabitants of the Netherlands and that policy-making would be based on that statement. Nevertheless, it took the government until the '90s to stop considering home language classes (Home Language Instruction - HLI- of 2.5 to 5 hours a week during the period of primary education) as a stigmatizing, necessary evil, enabling children to go back to their country of origin, and to start considering HLI as a facility that would have a positive effect on the self-esteem of children of ethnic origin. These two angle views are described by Broeder & Extra (1997) as HLI from a *deficit vs. cultural perspective* respectively.

For HLI from a deficit perspective, goals have been formulated in terms of bridging the home/school gap and contributing to second language learning and

school success for first and second generation children with a low socio-economic status (SES). As for HLI from a cultural perspective, the goal would be to contribute to first language learning and cultural awareness for all children with a home language other than Dutch, regardless of generation and SES. The latter view, however, is not taken by the majority of people who are responsible for educational policy, nor by many people who carry it into effect (teachers, social workers). A change of approach, however, into the direction of the cultural perspective may go hand in hand with the official renaming of HLI: *Onderwijs in Eigen Taal* (lit.: Education in Own Language) is now called *Onderwijs in Allochtone Levende Talen* (lit.: Education in Non-Indigenous Living Languages).

The language commonly used in HLI for Moroccan children in the Netherlands is the official language of Morocco, Modern Standard Arabic (MSA). This is not the home language of the children, for MSA is nobody's home language. It is the language used for reading and writing and it is used as a lingua franca in the media from Iraq to Morocco, and it is also the language of Islam. This causes a huge difference between HLI for Moroccan children on the one hand and for most of the other ethnic minority children (e.g., Turkish children) on the other. For Moroccan children (who speak either one of the Berber languages, which are not related to MSA from a language typology point of view, or Moroccan Arabic, one of the Arabic dialects that are (closely) related to MSA) this means they learn a *new* language in HLI classes.

In recent years, a number of studies into the language proficiency of ethnic minority children in the Netherlands were conducted (e.g., Boeschoten & Verhoeven 1986, Driessen et al. 1989, Aarts et al. 1995). Often Moroccan and Turkish children were compared to each other because the backgrounds of these two major groups are highly similar in terms of period of immigration, pattern of economic migration followed by social migration, and low SES. The outcomes of these studies usually show that Turkish children are better at Turkish than Moroccan children are at Arabic. The Arabic language tested in these studies is the language of HLI, *in casu* Modern Standard Arabic. It should come as no surprise that Moroccan children do not obtain the same level of scores as Turkish children, because MSA is a new language Moroccan children start to learn at age four, with only a few hours of instruction (varying from 2.5 to 5) a week, whereas Turkish children are being tested for Turkish, a language they speak and hear at home every day.

Within the same Dutch context, however, more and more studies are being conducted that involve the spoken home languages of Moroccans. We mention, as examples, De Ruiter (1989) on the use of Dutch, Moroccan Arabic and Berber by young Moroccans, Nortier (1990) and Boumans (forthcoming) on code-switching between Dutch and Moroccan Arabic by young Moroccans, and E-Rramdani & De Ruiter (1995) on the proficiency of Rif-Berber and Dutch by young Moroccan children.

1.3.1 The NWO research programme

In 1990, the Linguistic Research Foundation, which is funded by the Netherlands Organization for Scientific Research (NWO), started a research programme in cooperation with the universities of Tilburg and Nijmegen on processes of language variation amongst ethnic minority groups, with a focus on the status and use of Turkish and Moroccan Arabic in the Netherlands. Research projects were started within the following four domains:

- pre-school language acquisition
- language acquisition at school age
- language use among adolescents
- language shift and/or loss among adults

General overviews of the research programme and the projects that have been carried out within this programme can be found in Heeren et al. (1996), and Extra & Verhoeven (1994, 1996).

Van der Heijden (forthcoming) has conducted research on bilingual development among Turkish pre-schoolers (aged 2 to 3.5). She studied the language acquisition of L1 Turkish and L2 Dutch of 4 bilingual Turkish children living in the Netherlands and compared these data to those of 2 monolingual Turkish children and 2 monolingual Dutch children. She collected data on a monthly basis and has made an in-depth analysis of the language development of these children in a number of linguistic domains.

Aarssen (1996) studied the bilingual development of Turkish children during the primary school period (aged 4 to 11). This study by Aarssen and the present study have been conducted in close cooperation, which explains the similar designs of both studies. Results on different subsets of these two studies can be found in Aarssen (1992), Bos (1994), Bos & Verhoeven (1994), and Bos & Aarssen (1996). Aarssen also worked on two typologically different languages: Turkish and Dutch. He found that on the level of syntax, the Turkish bilingual children did not develop differently from monolingual children, nor were there large differences between L1 on the one hand and L2 on the other. On the level of pragmatics (discourse) he found that age is a much more important factor for differentiation than monolingualism vs. bilingualism or L1 vs. L2.

For the language use of adolescents, code-switching has been studied by Backus (1996) for Turkish-Dutch and by Nortier (1990) and Boumans (forthcoming) for Moroccan Arabic-Dutch. They studied the different patterns that young Turks and Moroccans use in creating their own in-group language. They analysed the different systems that emerged on the basis of constraints that were either obeyed or violated.

Schaufeli (1991) reports on language shift and language loss among Turkish adults and El Aissati (1996) on language shift and language loss among Moroccan adults. Turkish and Moroccan adults that had been living in the Netherlands for a number of years, participated in a number of different language tests. The aim of these studies was to show if language loss could be established and if so, in which linguistic domains.

1.4 THE PRESENT STUDY

Recent studies of first language acquisition made clear that, by the age of 4, children are in command of many of the grammatical principles and rules governing their native language (Goodluck, 1986). However, several studies provided evidence that, both at the level of competence rules and performance preferences, language development continues into the school years (Bowerman 1979, 1982; Karmiloff-Smith 1979, 1985). Later language development in children is characterized by a growing command of discourse principles. According to Karmiloff-Smith, such principles can be seen as the most significant domain of later language acquisition. Around age 5, developmental shifts take place from intra- to intersentential devices, and from basic structures to additional functions. Berman & Slobin (1994:594) also state that language development continues throughout childhood, and even well into adolescence.

With respect to bilingual development at school age, it is still largely unclear what sort of operating principles children use. Also, most bilingual studies that have been conducted so far were limited in their scope, given the fact that the languages under consideration were closely related. The analysis of children's data in two typologically unrelated languages will offer new perspectives on the role of structural properties of these languages in the process of acquisition. The domains of grammatical competence, on the one hand, and pragmatic competence, on the other, have proved to be highly significant in a large body of cross-linguistic studies on language acquisition in both children (Roeper & Williams 1987, Slobin 1985, Karmiloff-Smith 1979) and adults (Hyams 1986, Givón 1983).

In the present study we looked into the language development of Moroccan Arabic informants at school age from different angles. First of all there is a difference between what a language learner understands and how (s)he produces language. This is referred to by Klein (1986) as the difference between the *analytic* and the *synthetic* learning task respectively. In this study, the informants were put to these tasks in a number of ways.

First of all, we developed two language tasks which were quite complex for the youngest children. This was done on purpose. If one wants to know when a child acquires a certain principle, one has to start observing before that point in order to be able to follow development. In these two tasks, the informants showed

what analytic competence they had in specific linguistic fields. In order to investigate *grammatical competence* of the informants, we constructed two language tasks. One task dealt with *anaphoric reference* and the other one with *relative clauses*. Both tasks concerned complex sentences that the informants had to analyse. The sentences in the tasks were constructed in such a way that there were intrasentential references and only if the informant understood these references (s)he could perform the task correctly. The task involved either pointing at a particular picture that matched a sentence or acting out a sentence with toy animals. These sentences were read aloud to the children by a native speaker of the language involved. The purpose of this task was to discover at what age the children acquire the grammatical competence to analyse the sentences in these two tasks, to find out whether there was a difference between the developmental pattern in their first language (L1), on the one hand, and their second language (L2), on the other, and also to study whether there were developmental differences between bilingual and monolingual children.

In order to explore the *pragmatic competence* of the informants, the output in their retellings of picture stories was studied. In particular, we looked into how the informants connected events in their retellings of a picturebook story. One domain of analysis is *topic continuity*; therefore we looked at how the informants referred to key characters all through the story. All references were categorised into first introduction of a character, continued reference to a character (maintenance) and re-introduction of a character when another character temporarily became the topic of the retelling (switching). The second domain of analysis is *temporality*. This domain we studied by working through the retellings in search of several means of temporal reference. We differentiated between tense of a verb, aspect of a verb, and temporal adverbials. Also for this domain, we tried to find trends concerning development over time and differences and similarities concerning L1 vs. L2.

One other key dimension in this study is the use that has been made of reference points for Moroccan Arabic and Dutch in terms of *control groups*. Two monolingual control groups were used to see if there were differences in the development of grammatical and pragmatic competence between bilingual and monolingual children. One control group existed of Moroccan children living in Morocco and the other of Dutch children living in the Netherlands. The control group in the Netherlands consisted of classmates of the informants in the core group. The informants of the control group in Morocco lived in those parts of Morocco where the parents of the informants of the core group originally emigrated from.

On the basis of Aarssen's results (1996), we expected that the bilingual children would lag behind somewhat in their development in both L1 and L2, compared to Dutch and Moroccan monolingual children. In his research, however, it was found that by the end of the data collection period, when the informants

were 10 years old, there were not that many differences between monolingual and bilingual children. This was the case for both grammatical and pragmatic competence.

1.4.1 Overview of the chapters

The outline of this study will be described in Chapter 2. A description of the design, the informants, the database, and the way the data have been analysed will be given, as well as some information on the focus of the research domains. Then four chapters follow dealing with one research domain each. Chapters 3 and 4 focus on the *analytical* tasks the informants had to perform in domains concerning the development of their grammatical knowledge. The outcomes of these tasks show how the informants analysed the sentences that were presented to them, how they dealt with this analysis in the two different languages in question, and in what way their analysis changed as they got older. Chapters 5 and 6 focus on the *synthetic* tasks the informants had to perform in domains concerning the development of their pragmatic knowledge. The outcomes of these tasks show which linguistic devices the informants used to relate events, how they did this in the two different languages in question, and in what way their use of these devices changed as they got older. In Chapter 7 conclusions for each domain are summarized. Moreover, some general conclusions are presented, as well as suggestions for future research and a modest attempt at drawing some educational conclusions on the basis of this study.

2 DESIGN OF THE STUDY

2.1 INTRODUCTION

The focus of this study is the process of bilingual development of arabophone Moroccan children in the Netherlands. The language development these children go through is quite complex. First, they learn Moroccan Arabic at home and in the context of their ethnic community. In addition, some Dutch might enter into their lives through television, peer contact and occasionally through day-care. From the moment they enter primary school, however, all of a sudden the greater part of their language input is Dutch.

Regarding the linguistic development of school-age children, it is still largely unclear what sort of strategies these children use in order to deal with bilingual acquisition. One of the interesting topics in later language development (that is, at school age) is how learners (be it in L1 or L2) learn to comprehend and produce the linguistic means that explain the linguistic relations within and between utterances in a language (*cohesive devices*). To fully understand all the relations between different words, sentences, and clusters of sentences and to be able to express these relations as well are of great importance in learning a language.

In this study, we concerned ourselves with both the development of grammatical competence and the development of pragmatic competence, because for both kinds of development the ability to comprehend and produce cohesive devices is a crucial factor. The analysis of the children's bilingual development was focused on the acquisition of cohesive devices on the intra- and intersentential level and over spans of connected utterances.

Many studies that have been conducted on the development of bilingualism concerned languages that are highly related. This study on the bilingual development of children in two typologically unrelated languages, such as Dutch and Moroccan Arabic, will undoubtedly provide new insights in the process of bilingual acquisition.

The following key questions were addressed:

(1) How are the grammatical systems of bilingual Moroccan children in the age range between 4 and 11 in the first and second language elaborated?

(2) How do bilingual Moroccan children in the age range between 4 and 11 learn to master pragmatic rules for anchoring discourse structure in narrative production?

To answer the above-mentioned questions, pseudolongitudinal first and second language data collected from children in the age range from 4 to 11 were analysed.

2.2 LINGUISTIC DOMAINS

With respect to grammatical competence, the development of anaphoric reference and relative clauses were examined. With regard to pragmatic competence, the development of topic continuity and temporality in discourse were explored. All of these domains proved to be highly significant in a large body of cross-linguistic studies on language acquisition in relation to cohesive devices (cf. Givón 1983; Hyams 1986; Karmiloff-Smith 1979; Slobin 1985, 1988). Cross-linguistic attention was paid to typological differences between Moroccan Arabic and Dutch in each of these domains. In the following sections, a short introduction into these domains will be presented. They will be dealt with more elaborately in Chapters 3 through 6.

2.2.1 Anaphoric reference

For the domain of anaphoric reference the developmental patterns of bound and free anaphora in the children's first and second language were explored. The distinction between these two types of anaphors refers to two different principles in the Binding Theory of Chomsky (1981). Principle A concerns bound anaphors, such as reflexives, and states that they must be bound to their antecedent in their governing category. The term 'bound' here means 'c-commanded by and coindexed with its antecedent.' Principle B concerns free anaphors, such as pronouns, which are not allowed to have a c-commanding antecedent in their governing category; the pronoun must be free. In sentence (1) 'the friend' is the only possible antecedent for the bound anaphor 'himself' and in sentence (2) 'John' is a possible antecedent for the free anaphor 'him,' but not the only one. 'Him' might also refer to an antecedent outside this sentence.

(1) The friend $_{(i)}$ of John $_{(j)}$ hits himself $_{(i)}$
(2) The friend $_{(i)}$ of John $_{(j)}$ hits him $_{(j,k)}$

In earlier studies on the acquisition of bound and free anaphors by monolingual children, a fast rate of acquisition could be evidenced with respect to bound anaphors. It seems that knowledge of Principle A is guiding the development (Koster 1988b, 1993). It also became clear that the development of free anaphor

resolution shows a more irregular and delayed development.

In the present study, we investigated the acquisition of anaphoric reference by Moroccan children in L1 and L2 by means of an experimental task. The experimental design involved a one-sentence/four-pictures multiple choice task based on and similar to the one used by Deutsch, Koster & Koster (1986). It was examined how children in the age range from 4 to 11 learn to understand and apply the coding devices for bound and free anaphoric reference in their first and second language systems over time.

The goal of this part of the study was to find out at what age these children start to understand the difference between sentences like (1) and (2). We looked into the strategies they use for their interpretations. Other questions we dealt with are: is there a specific moment in time when the informants suddenly show a correct performance or is there a more gradual development? Are there differences between the informants' development in Moroccan Arabic on the one hand and in Dutch on the other? Is there a difference between monolingual and bilingual children?

2.2.2 Relative clauses

There are several reports on the processing of relative clauses in a variety of unrelated languages. From the studies of Hakuta on Japanese (1981), Clancy, Lee & Zoh (1986) on Korean, Japanese and English, and MacWhinney & Pleh on Hungarian (1988), it has become clear that a combination of factors seems to determine the processing of relative clauses:

(1) *the grammatical role played by the head of the relative clause*: it makes a difference whether the grammatical function of the head is subject, direct object, indirect object or one of the other possible functions.

(2) *the use of word order configurations in surface structure*: it makes a difference whether the basic word order in a language has to change because of the construction of a relative clause and whether this is a minor or a major change.

(3) *the interruption of processing units*: it makes a difference whether the relativised clause stands at the beginning, in the middle or at the end of the main clause. This depends on the language and on the word order used and on the grammatical role played by the head.

(4) *the use of grammatical markers as cues to processing*: in some languages grammatical markers (such as number agreement and gender agreement) determine the underlying relations between words in a sentence.

In the above-mentioned studies, many different sentences with different possible relative clause constructions have been used. To give the reader an idea, sentences were used like:

(3) The donkey that bites the lion, kills the bird
(4) The donkey kills the bird that bites the lion

These sentences either corresponded with different types of pictures, or the informants had to reproduce them, or they had to act them out, or they had to perform some kind of verbal or non-verbal action that showed the researcher whether they understood the sentence. In some languages, these sentences (or other constructions similar to these) are ambiguous. The interpretations of the informants give important clues to the researcher as to what strategies they use in processing the sentences.

In sentence (3), the donkey is the subject of the main clause *the donkey kills the bird*, and it is also subject of the relativised clause *the donkey that bites the lion*. In order to be able to refer to a sentence that is constructed in this way, the term *ss* sentence has been used in earlier research on relative clauses. The acronym *ss* stands for the fact that the *head* of the sentence (the donkey) is subject in both clauses. According to this line of reasoning, sentence (4) is an *os* sentence: the bird is the head, and it is object in the main clause *the donkey kills the bird* and subject in the relativised clause *the bird that bites the lion*. Obviously, more constructions of this kind can be constructed in most languages and this will be done extensively in Chapter 4. From the above-mentioned studies across Indo-European languages, the general finding is that for children at school age, subject-subject (*ss*) sentences are relatively easy to process and subject-object (*so*) sentences relatively complex, while object-object (*oo*) and object-subject (*os*) sentences occupy an intermediate position.

The attempts made in the above-mentioned studies to relate typological differences to sentence processing difficulties underscore the need for cross-linguistic studies on the acquisition of relative clauses. In this research project, we examined the acquisition of relative clauses in Moroccan Arabic and Dutch. We investigated in what order the various types of grammatical relations in relative clauses in Moroccan Arabic and Dutch were acquired in terms of processing capacity. The prediction from the above-mentioned cross-linguistic evidence was that *ss* sentences would be acquired first, followed by *os* and *oo* sentences and that *so* sentences would be acquired last.

There were certain conditions to the construction (see section 4.3.2) of this experiment which made it impossible for Dutch to use different word orders. For Moroccan Arabic, however, it was possible. Therefore the effect of word order on relative clause difficulty was explored in Moroccan Arabic only. As the one word order involves a basic grammatical structure and the other a rather complex grammatical structure, the prediction was that the former would be easier to process than the latter.

In this part of the study, our goal was to find out at what age our informants start to understand the difference between sentences like (3) and (4). We were also interested in finding out what strategies they use in this process. Other questions were addressed: Is there a specific moment in time when the informants suddenly show a correct performance or is there a more gradual development? Are there differences between the informants' development in Moroccan Arabic on the one hand and in Dutch on the other? Is there a difference between monolingual and bilingual children?

2.2.3 Topic continuity

The way major characters or protagonists in a narrative are represented is one of the crucial factors in its organization. Protagonists can be described in various ways: by a full noun phrase, a pronoun, or by zero-marking. There are some differences between the linguistic devices for reference to entities in Dutch and Moroccan Arabic. Dutch uses a set of pronouns marking person (first/second/third) and number (singular/plural). There is a gender distinction for third person and a politeness form for second person. In object position, most of the pronouns are inflected. Moreover, Dutch has explicit and distinct markers for indefinite and definite reference. The set of pronouns in Moroccan Arabic also marks person and number. Second and third person pronouns have distinct gender forms. In object position, pronouns are suffixed to the verb form. The use of pronouns is optional in subject position, but subject pronouns only occur when the verb is absent, or in case of emphasis. Pragmatic functions determine the use of pronouns in conversation. The unmarked way of subject reference is zero-marking. Both reference to entities and properties can be marked for definiteness and indefiniteness, irrespective of their syntactic role.

In the present study, topic continuity was studied by analysing samples of connected utterances in the children's speech. It was explored how children acquire and develop the coding devices for topic continuity in their first and second language systems over time. A distinction was made between coding devices for the introduction, maintenance and shift of referents. It was expected that in the age range from 4 to 11, children learn to apply the basic devices for topic continuity: NP for the (re)introduction of a referent and a pronoun or zero-reference for the maintenance of referents. Moreover, a differentiation between the degree of prominence of main characters was expected to be made by the older children, in both L1 and L2. Special attention was paid to specific language characteristics that are not similar in both languages (such as pro-drop).

2.2.4 Temporality

In exploring reference to time, two fundamental categories of temporality were distinguished: tense and aspect. Tense refers to the anchoring of events to a given reference time, for instance whether an action has ended or is still going on.

Aspect refers to the various perspectives that can be taken towards an event, such as durative or inchoative aspect, for instance, whether an action goes on over a long span of time or stops almost immediately after it started.

The temporal systems of the two languages under consideration differ considerably. Dutch can be characterized as a language with a restricted tense system and an even more restricted aspect system. Basically, there is a contrast between present, simple past and perfect. Aspectual features are sometimes expressed by conjuctions and adverbs; and sometimes by means of adding forms of *zijn* (to be) and *hebben* (to have) to the verb, durative respectively inchoative aspect is expressed. Moroccan Arabic distinguishes between two combined tense/aspect oppositions, conventionally called *imperfect* and *perfect* by grammarians of (Standard) Arabic. The imperfect has basically non-past time reference. This is called *inaccompli* in the terminology of Caubet (1993b:184) in her voluminous study on the grammar of Moroccan Arabic; the perfect indicates both perfective meaning and relative past time reference (*accompli* in Caubet, 1993b:200). In order to express perfect or past imperfective time reference, an auxiliary is required, even in the presence of a time adverbial, explicitly indicating past time. More refined distinctions for time reference can be made by means of a range of prefixes and particles. Some modern grammarians, such as Holes sometimes prefer to avoid using these terms because "... they have a wide range of temporal/aspectual uses" (1995:86). He feels the terms therefore might become misleading, and introduces neutral morphological labels: suffixed stems (*s-stems*) and prefixed stems (*p-stems*). Caubet uses similar labels in cases where explanations of the derivations are concerned and uses inaccompli/accompli in cases where tense/aspect differences are concerned. In this study we followed the distinction made by Caubet.

In the present study, both tense and aspect variation in the narratives of the informants were dealt with. Given the substantial differences of the temporal systems in the languages under consideration, the simultaneous acquisition of linguistic devices for temporal reference was considered as highly relevant. Within this domain it was explored how the temporal organization of children's narratives in their first and second language developed over time.

2.3 INFORMANTS

There were three groups of informants. The *core group* was a group of bilingual Moroccan children living in the Netherlands. They spoke Moroccan Arabic as their first language and Dutch as their second language. There were *two control groups*: one consisting of monolingual Dutch children living in the Netherlands and one consisting of monolingual Moroccan children living in Morocco. The data in the Netherlands were collected according to a *pseudo-longitudinal* design (two age groups that were followed for several years) and the data in Morocco in a *cross-sectional* way (three different age groups). Longitudinal data collection in

Morocco would have proved too time-consuming and logistically too difficult to execute within the scope of our project. The following sections will give a description of the groups of informants and the data collection schedule.

2.3.1 Bilingual Moroccan informants in the Netherlands

Bilingual informants of two age groups participated in this project, 4 and 8 years old, respectively, at the beginning of the project. Each age group originally consisted of 45 informants. The children come from 13 schools with a multi-ethnic population in 5 different cities. These schools are all situated in areas where people with a low socio-economic status live. With one-year intervals, the 4-year-olds were tested four times, the 8-year-olds three times. This is what will be referred to as a *pseudo-longitudinal* design: there are children aged 4, 5, 6, 7, 8, 9, and 10 years old, divided into two groups (a group aged 4 at the beginning of the project and aged 7 at the end and a group aged 8 at the beginning of the project and aged 10 at the end). A truly longitudinal design with one group of informants over this age range (children aged 4 at the beginning of a project and aged 10 at the end) involves 6 years of data collection whereas ours involved 3 years. Due to factors such as class repeat, referral to special education, or moving of the children's families to another area/city, the final number of children was eventually 25 per group.

The children belong to the second generation of immigrants who initially moved from rural areas in Morocco to industrialized areas in the Netherlands. The informants originate from Moroccan Arabic-speaking families. This means that there are no children involved that speak a Berber language at home. Their parents come from all over Morocco, ranging from big cities like Casablanca, Fes, Meknes, Tetouan, Tanger or Marrakech to smaller villages and hamlets in the Atlas mountains or the Rif area. All informants frequent Dutch primary schools and have been living in the Netherlands for at least 2 years prior to the beginning of the project. The distribution of boys and girls is 50%-50%. Of these children, 80% attend lessons in Modern Standard Arabic at school for a maximum of 2.5 hours a week.

In Table 2.1 the distribution of the two age groups by school and region is shown:

Table 2.1 Regional distribution of bilingual informants in the Netherlands

School	*Ethnic minority pupils (%)*	*City*	*N informants age group 1*	*N informants age group 2*
Joop Westerweel	80%	Amsterdam	6	5
De Evenaar	94%	Amsterdam	-	5
De Kraal	80%	Amsterdam	5	-
De Kinderboom	80%	Amsterdam	1	-
De Slootermeer	85%	Amsterdam	4	-
Thimotheus	80%	Amsterdam	2	-
van Asch van Wijck	95%	Rotterdam	3	3
Nelson Mandela	95%	Rotterdam	1	-
De Kei	75%	Rotterdam	-	2
De Singel	25%	Leiden	-	3
De Marnix	90%	Leiden	-	1
Thomas More	70%	Tilburg	-	3
Juliana van Stolberg	88%	Ede	3	3
		N total	25	25

2.3.2 Dutch control group in the Netherlands

The monolingual Dutch control group consisted of Dutch classmates of the bilingual informants of this project and also a number of Dutch classmates of the Turkish bilingual informants in the research done by Aarssen (1996). Most of the parents are unskilled labourers or are unemployed; therefore these children belong to families with a rather low socio-economic status.

A total of 17 schools in 9 cities participated in this part of the project. On January 1, 1994, the number of inhabitants of the 9 cities in question ranged from 62,000 to 725,000. Amsterdam, Rotterdam, Den Haag and Leiden are situated in the west of the Netherlands, Tilburg and Oss in the south, and Ede, Almelo and Hengelo in the east.

In Table 2.2 the distribution of the Dutch control group by school and region is shown:

Table 2.2 Regional distribution of monolingual informants in the Netherlands

School	*Ethnic minority pupils (%)*	*City*	*N informants age group 1*	*N informants age group 2*
Joop Westerweel	80%	Amsterdam	1	3
De Kraal	80%	Amsterdam	1	-
De Kinderboom	80%	Amsterdam	1	-
De Slootermeer	85%	Amsterdam	1	-
Thimotheus	80%	Amsterdam	2	-
van Asch van Wijck	95%	Rotterdam	-	1
De Kei	75%	Rotterdam	4	1
De Singel	25%	Leiden	-	4
De Marnix	90%	Leiden	-	1
Thomas More	70%	Tilburg	3	2
Juliana van Stolberg	88%	Ede	-	1
De Kerkelanden	75%	Almelo	2	1
Jan Ligthart	65%	Hengelo	4	3
De Driesprong	85%	Den Haag	1	-
J.F. Kennedy	35%	Oss	5	8
		N total	25	25

2.3.3 Moroccan control group in Morocco

There was a second control group which consisted of monolingual Moroccan children living in Morocco. In Morocco, children enter school at the age of 7. There is a possibility to attend a private kindergarten, a so-called *maternelle* or *garderie* from the age of 5 to 6, but that only happens with children whose parents can afford it. We thought it desirable to have informants aged 5, 7 and 9, so that agewise they are comparable to the informants in the Netherlands. Therefore both children from private (5-year-olds) and public schools (7- and 9-year-olds) participated in our study. In order to be able to have 5-year-old informants, it was inevitable that children of higher socio-economic status participated in the project. It will be, however, a point of attention in the discussion of the results of these 5-year-old children. The youngest informants came from three different kindergartens, in Rabat, Oujda and Tanger. The older children, aged 7 and 9, attended public schools in either Rabat, Oujda, Tanger or Fes. Rabat is situated in the west of Morocco, Tanger in the north-west, Oujda in the north-east and Fes in central Morocco. At present, the number of inhabitants of these fairly big cities ranges from 410,000 to 720,000.

Table 2.3 shows the number of informants in Morocco and their distribution by school and city:

Table 2.3 Regional distribution of monolingual informants in Morocco

School	*City*	*N informants age 5*	*N informants age 7*	*N informants age 9*
St. Gabriel	Rabat	9	-	-
Ouroubba	Oujda	8	-	-
Firdaws	Tanger	8	-	-
Abdelmoumen	Rabat	-	7	7
Ibn Hamdis	Oujda	-	6	6
Moulay Ismail	Tanger	-	6	6
Ibn Tufayl	Fes	-	6	6
	N total	25	25	25

2.4 TASKS

From all informants described in the previous section, both experimental and semi-spontaneous data were collected at different moments. Two experimental tasks were developed and administered to the children to gain insight into their ability to process complex sentences with different levels of presumed difficulty. One task involved the comprehension of sentence-internal anaphoric reference and the other one different types of restrictive relative clauses. The informants also produced retellings of six short stories of 6 pictures each and of one long story of 24 pictures. These retellings were recorded on tape and are referred to as the semi-spontaneous data.

2.4.1 Experimental tasks

For the domain of anaphora, two experimental tasks were developed, one oral and one written. The oral task was derived from Deutsch, Koster & Koster (1986), who conducted their study with monolingual Dutch children. The written task has been derived from Barnitz (1979). The oral task consisted of 24 short sentences, either with a bound, reflexive anaphor or with a free, non-reflexive anaphor. There was one version in Dutch and one in Moroccan Arabic. The test sentences each contained either a Dutch or a Moroccan Arabic equivalent to one of the following, carefully selected verbs: *to wash, to scratch, to defend, to pinch, to tie up* and *to release*. Two invented friends, named *Martijn* (a Dutch boy's name) and *Karim* (a Moroccan boy's name), served as potential antecedents for the anaphoric pronouns. The set-up of the task will be described in Chapter 3 and the two versions of the task (Dutch and Moroccan Arabic) are provided in Appendix I.

The written task was conducted only for the older age group because of the fact that children in the Netherlands start to learn how to read and write at the age of 6 and are able to perform such a task before the age of 7 or 8. It was conducted in Dutch only, because there is no standardized writing system of Moroccan Arabic that these children are able to use without any problems. In this task there were 8 stories with one multiple choice (4 possible answers) question each. The factors that were used to manipulate the stories were: referent type, referent distance and reference order. The design of the task will be described in Chapter 3 and the text of the whole task can be found in Appendix II.

In order to explore the domain of relativisation, another task was constructed, of which there were also two versions: one in Dutch and one in Moroccan Arabic. Each version consisted of 32 relative clauses, involving six nouns as actors and four verbs as activities. The nouns referred to animals and the verbs referred to different types of activities: the Dutch and Moroccan Arabic equivalent nouns of *lion, monkey, bear, dog, cat* and *mouse* and the equivalent verbs of *to stroke, to hit, to pinch* and *to kiss*. We will elaborate on the set-up of this task in Chapter 4. Both versions can be found in Appendix III.

2.4.2 Narratives

In order to collect data for the domains of topic continuity and temporality, the children were asked to retell the famous *frog story* (*Frog, where are you?*), constructed by Mayer (1969). The frog story contains twenty-four pictures and has no written text. The plot is as follows: two main characters, a boy and his dog, are looking for their pet frog, that has escaped. Both the boy and the dog get involved in different activities and adventures in their search and meet all kinds of other animals. At the end, there is a happy reunion of the three. A description of the pictures of the frog story is presented in Appendix IV.

From earlier studies in which narratives were collected through picture retelling, it appears that young children often use deictic reference instead of more anaphorical means to refer to characters from the plot (see, for instance, Hickmann 1991). It has been argued that this could be due to the fact that child and researcher share the same context because they view the same pictures. Therefore, the child does not necessarily have to spell out all information to the researcher. Pronouns that are used then, might refer to the actual here-and-now context and might therefore be deictic (see also Bamberg 1986). For this reason, the children participating in this study were given the instruction to hold the picture booklet without showing it to the researcher. The researcher told the child that (s)he would turn his/her back to the child, to make sure (s)he was unable to look at the pictures. The child was given the instruction not to show the pictures to the researcher during the narration. This could easily be presented as a "game" or "secret" between researcher and child.

2.5 DATA PROCESSING

The data in this study consist of the outcomes of the experimental tasks and the retellings of stories. On the outcomes of the experimental tasks, statistical analyses were performed (ANOVAs: Analyses of Variance). The retellings were recorded on tape and transcribed according to a standardized coding system. These data were analysed in a more qualitative way.

2.5.1 Data collection

The experimental data as well as the semi-spontaneous data were collected with one-year intervals in the Netherlands. Data collection in Morocco was conducted according to a cross-sectional design. The data collection schedule is presented in Tables 2.4 and 2.5:

Table 2.4 Data collection schedule in the Netherlands by age of the informants

Netherlands	*Moroccan children*		*Dutch children*	
	Age group 1 N=25	*Age group 2 N=25*	*Age group 1 N=25*	*Age group 2 N=25*
Experiment conducted year 1	4	8	4	8
Experiment repeated				
year 2	5	9	5	9
year 3	6	10	6	10
year 4	7	-	7	-

Table 2.5 Data collection schedule in Morocco by age of the informants

Morocco	*Age group 1 N=25*	*Age group 2 N=25*	*Age group 3 N=25*
Experiment conducted year 2	5	7	9

The task for anaphora (see Chapter 3 for a description of the task construction) was administered to the bilingual informants in the two languages in different sessions and by native speakers of Moroccan Arabic and Dutch respectively. The test sentences were read out loud while four pictures were shown at the same time with only one picture matching the test sentence. The other three pictures showed actions that differed systematically from the correct picture: one picture showed the right actor but the wrong action, another one showed the wrong actor but the right action, and the third one showed the wrong actor as well as the wrong action. The informant was asked to point to the picture that matched the sentence. The same conditions were applied to the task on relative clauses. The interviewer

read the sentences out loud. For each sentence in the task, the child was asked to act out the actions in the sentence with toy animals placed in front of him/her.

In the case of the *frog story*, the children held a series of pictures in front of them and they were asked to first look at the pictures without telling the story, and then tell it, while looking at the pictures. During the narration, the researcher played the role of a listener who was attentively following the story line. When the child's narration stopped, the researcher gave some cues to make the child continue the story. These cues were limited to suggestions of continuing the narration (such as: "go on," "what more can you tell?"). Questions directly referring to the content of the story or to the continuation of the plot (such as "why is the boy angry?", "what does the dog do?") were avoided, as not to influence the informant on how to create a cohesive retelling. The narrations were recorded on audiotape.

The experimental tasks for both anaphoric reference and relative clauses were administered by the interviewer in a separate room in the school during two sessions with an interval of at least one week. Half of the anaphoric reference task and half of the relative clauses task were administered in the first session and the other two halves in the second session. The interviewer wrote down the actions performed by the child. During the second session the informant was asked to retell the frog story. This means that each year data were collected during four different sessions in the case of the Moroccan informants (2 sessions in Dutch and 2 sessions in Moroccan Arabic) and two different sessions in the case of the Dutch control group informants (session 1 and session 2, both in Dutch) over a time span of about one month. In Morocco different age groups were interviewed at the same time, with a time interval of a few days between session 1 and session 2.

2.5.2 Data transcription

The data were transcribed according to the conventions of CHAT (*Codes for the Human Analysis of Transcripts*), the coding system of the CHILDES project (*Child Language Data Exchange System*; MacWhinney 1991). To be able to work with CHAT, there are a few basic codes that every transcript must contain. If these basic conditions are met, the CHILDES program will accept the transcripts for analysis. Some of these basic codes are **@Begin** at the beginning of a transcript, **@Participants** to indicate who are the people producing utterances in the particular transcript, and **@End** at the end. The most used codes in this study were those for repetition (**[/]**), correction (**[//]**), pauses (**###**), unfinished words (**&**), and ingrammaticalities and other peculiarities (**@**). Examples of transcripts are included in Appendix V.

2.5.3 Data analysis

For the experiments on anaphoric reference, mean correct scores on all versions of the tasks were computed. Attention was also given to the erroneously performed sentences in the oral task. We differentiated between correct answers, and three sorts of errors:

(1) the picture in which the right action takes place, but performed by the wrong actor (*antecedent error*);

(2) the picture in which the right actor but the wrong action is displayed (*anaphoric error*); and

(3) the picture in which neither the right actor nor the right action is shown (*double error*).

For the experiment on relative clauses, the correct scores on the four different sentence types were computed for both languages. We also looked into the erroneously performed sentences: at the moment the children acted out the test sentence they heard, the researcher wrote down exactly which actions the informant performed. In this way an error analysis was made possible. For Moroccan Arabic, we have not only taken sentence type into consideration, i.e., the differences between performances on *ss, so, os* and *oo* sentences, but also word order, i.e., the differences between performances on *svo* and *ovs* ordered sentences.

In examining the acquisition of topic continuity, we explored the ways characters are introduced, switched, and maintained by the informants while dealing with the representation of the main characters in the *frog story*. We looked at how the informants introduced a new character at the beginning of the narration, how they switched from one character to another and how they referred to the characters when these were maintained as referents in subject position.

For temporality, we focused on the ways the informants shifted between past and present tense in their narratives and how aspect played a role in their utterances. Attention was also paid to inherent features of the verb and temporal adverbials and particles.

For all domains, comparisons were made between the performances in the first language on the one hand and the second one on the other by the Moroccan bilingual children in the Netherlands (*L1 versus L2*). We also looked into differences and similarities between the performances in Moroccan Arabic of the bilingual core group in the Netherlands and the monolingual control group in Morocco as well as the performances in Dutch of the bilingual core group in the Netherlands and the monolingual control group in the Netherlands (*bilinguals versus monolinguals*). Particular developmental strategies that young children (irrelevant of their language background) used when they had difficulty in

understanding or performing a certain linguistic task, were also taken into consideration, as well as language-specific strategies (*developmental versus language-specific strategies*).

3 ANAPHORIC REFERENCE

3.1 INTRODUCTION

At an early age, children are known to use pronouns (mostly personal and demonstrative pronouns, such as 'I,' 'you,' 'this,' 'that') as means of referring to entities. The initial use of these pronouns, however, cannot be called anaphoric reference, for the young language learner will use additional markers to make clear what the exact relation is between the pronoun and the entity it refers to. A popular device in this case is the use of gestures. This combination of verbal reference and gestural aid is commonly referred to as *deictic reference.* The child highly depends on the actual situation (s)he and the listener are in, linking the pronoun to a referent that is present in the here-and-now of both speaker and listener (Clark 1978, Tanz 1980). In a later stage the child no longer needs gestures or a shared physical circumstance with the listener to make this listener understand what (s)he is referring to. The learner has, by then, acquired a certain level of linguistic knowledge in that (s)he is able to use linguistic references that make clear what the antecedent of the pronoun is. This form of reference in which the learner depends only on linguistic cues is called *anaphoric reference.*

A distinction can be made between *sentence-internal anaphors* and *discourse anaphors.* For sentence-internal anaphors, specific syntactic information combined with linguistic rules or principles plays a very important role in constraining the range of possible antecedents. Sentence-internal anaphors can be divided into free and bound anaphors. This distinction is being made on the basis of two principles that have been developed by Chomsky (1981) in his Binding Theory:

- Principle A concerns *bound anaphors,* such as reflexives, and states that they must be bound to their antecedent within the same local domain. In fact, the term 'bound' means 'c(onstituent)-commanded by and coindexed with its antecedent' (obligatory reference).

- Principle B concerns *free anaphors,* such as pronouns, which are not allowed to have a c(onstituent)-commanding antecedent in their governing category; the pronoun must be free (optional reference).

In example (1), 'the friend' is the only possible antecedent for the bound anaphor 'himself,' and in example (2), 'John' is *a possible* antecedent for the free anaphor 'him,' but not the only one: 'him' might also refer to an antecedent outside this sentence.

(1) The friend $_{(i)}$ of John $_{(j)}$ hits himself $_{(i)}$

(2) The friend $_{(i)}$ of John $_{(j)}$ hits him $_{(j,k)}$

The concept of discourse anaphors refers to the comprehension and production of anaphors on the level of discourse which involves several types of knowledge, e.g., lexical, thematic, and syntactic knowledge. Karmiloff-Smith (1981) investigated the development of pronoun reference at the discourse level by means of retellings of a 'balloon story' by children aged 4 to 9 years. The youngest learners appeared to rely highly on verbal reference in combination with extralinguistic cues (gestures). A middle group developed an anaphoric reference strategy based on thematic constraints: they identified a thematic subject in the story and then put this subject (in pronominal form) in sentence-initial position for the rest of the retelling. The oldest children used a more adult-like strategy in that they were no longer bound to any constraints except linguistic rules. This type of anaphors will be studied in Chapter 5 (topic continuity).

One of the factors that might play a role in the acquisition of anaphors is the *direction* of reference, which can be either *backward* or *forward.* In sentence (3) the reference is backward, i.e., the pronoun precedes the referent. This is a case of optional reference: 'he' might refer to John, but not necessarily. If the preceding sentence were "John's son was not feeling well," 'he' might just as well refer to 'John's son' as to 'John.' Sentence 4 shows an optional forward reference: again 'he' might refer to John, just as it might refer to somebody outside the sentence.

(3) Because he $_{(i,j)}$ was ill, John $_{(i)}$ did not go to school

(4) John $_{(i)}$ knew that he $_{(i,j)}$ would not be able to go to school

Another factor that should be taken into consideration concerning the acquisition of anaphors is the *form* (or *type*) of the antecedent. It has been suggested that there is a difference in level of difficulty in establishing the right referent when the anaphor refers to a *noun* (*phrase*) on the one hand, or to a *sentence* or a *clause* on the other. The latter often contains more information than the former, which might be an extra clue for establishing the antecedent, whereas at the same time, sentences usually have a more complex construction than noun phrases, which might be an obstruction to finding out what the antecedent is. For instance, it is very difficult to come up with a well-argued hypothesis as to whether sentence (5) is easier to comprehend than sentence (6) or the other way around.

(5) I asked Peter [to clean his room] $_{(i)}$, but he has not done it $_{(i)}$ yet

(6) I asked Peter if he had seen the teacher $_{(i)}$, but he said he had not seen him $_{(i)}$ yet

In this chapter, the process of bilingual acquisition of anaphors will be studied from an interdisciplinary point of view, combining insights from linguistic theory and developmental theory. From a formal linguistic point of view, bilingual development can be defined as an "instantaneous" process in an ideal situation in which the child has at his or her disposal all of the principles and parameters of universal grammar (UG) and two sets of input data necessary to fix those parameters. Given the obvious fact that languages are not acquired instantaneously, developmental theory must explain the various "delays" which characterize both first and second language development.

3.2 RESEARCH QUESTIONS

In a variety of studies, the acquisition of lexical anaphors and pronouns has been studied by means of oral and written experiments in languages such as English and Dutch (Barnitz 1979; Deutsch & Koster 1982; Deutsch, Koster & Koster 1986; Koster 1988b; Wexler & Chien 1985). With respect to bound anaphors, a fast rate of acquisition could be evidenced. Furthermore, it has become clear that the development of free anaphor resolution shows a more irregular and delayed development (Koster 1988a). These studies have made it clear that there are many arguments in favour of taking into account not only the correct scores of the children in an experimental task, but also taking a closer look at what kind of errors children make and what kind of strategies might be underlying the errors they make. It has also been shown that factors such as type of referent (noun, noun phrase, clause, sentence), distance of referent (reference within one sentence or between sentences) and order of reference (pronoun precedes referent or pronoun follows referent) play an important role in the processing of free anaphoric reference (Barnitz 1979).

The following questions and considerations have been kept in mind at the time of constructing the experiments that will be described in 3.3.3 and 3.3.6:

- What is the difference, if any, in the pattern of acquisition of *bound anaphors* on the one hand and *free anaphors* on the other? If there is a difference, what explanations might account for it?

If knowledge of principle A and B is part of an innate competence, it might be assumed that there will be no difference in processing sentences that contain either a bound or a free anaphor. On the other hand one might suggest that in the performance of younger children *overgeneralisation* will play a role in the

acquisition of free anaphors: due to the fact that the child already has some knowledge of pronominal use at the sentence-external level and overgeneralises this temporarily to the sentence-internal level, (s)he will perform better on items with a free anaphor than on items with a bound anaphor.

- What is the difference, if any, in the *distributional pattern of errors,* regarding the error types? If there is a difference, what explanations might account for it?

Regarding the errors the children will undoubtedly make, different error types can be distinguished in case of the task used for this study (see 3.3.3. for a description of the construction of the task). The *Minimal Distance Principle* derives from one of the theories that might provide us with insight into one of the strategies children use. The MDP implies that the anaphoric element, 'him' or 'himself,' will be interpreted as referring to the last mentioned noun in the sentence.

The theory of *Lexically Directed Orientation* (Koster 1993) states that children have limited lexical knowledge of the argument structure of both types of anaphor, whether they are using further configurational knowledge of binding or not. When a child hears a sentence with a bound anaphor in a multiple pictures task, (s)he will choose a picture that shows an action oriented towards the "self" and never an other-oriented action picture; when a child hears a sentence with a free anaphor, (s)he will choose an other-oriented action sentence and not a self-oriented action picture.

According to the *Cognitive Reflexive Strategy* (Grimshaw and Rosen 1990), the child sees herself/himself as center of the world and therefore has a preference for attributing one and the same person to carrying out and undergoing the action in a particular event. This then results in children performing best on test sentences with reflexives (bound anaphors). In the "strong" version of this theory, the child always chooses a reflexive action in a 'one-sentence/multiple-pictures' task no matter what. And according to the "weak" version, the child randomly chooses one of the self-oriented action pictures for a reflexive sentence and is free to choose any of the other pictures for a pronominal sentence.

- What is the difference, if any, in the pattern of acquisition of *intersentential reference* on the one hand and *intrasentential reference* on the other? If there is a difference, what explanations might account for it?

As regards the difference in processing of intrasentential and intersentential anaphoric reference, it will be difficult to make a well-argued assumption as to whether one of the two will be easier than the other. Knowledge of linguistic rules, on the one hand, and the ability to process semantic and pragmatic cues, on the other, will both play an important role. We might, however, hypothesize that intrasentential reference will be easier than intersentential because the antecedent is nearest to the anaphor (Minimal Distance Principle).

- What is the difference, if any, in the pattern of acquisition of *forward anaphors* on the one hand and *backward anaphors* on the other? If there is a difference, what explanations might account for it?

Here, the same difficulty holds: on the one hand one might suggest that because a noun (phrase) usually is less complex, it will be easier to process reference to a noun (phrase) than to a sentence or clause (complexity affects recall). On the other hand, a clause or sentence usually contains more information than a noun (phrase) and therefore offers more memory aids which are very useful in the processing of anaphoric reference.

- What is the difference, if any, in the pattern of acquisition of *anaphors that refer to a noun phrase* on the one hand and *anaphors that refer to a sentence or a clause* on the other? If there is a difference, what explanations might account for it?

In several studies, evidence was found that forward reference is easier to process than backward reference. According to Carden there are universal tendencies favouring forward anaphors (1982, 1986). Reinhart (1986:140) also agrees that "forward anaphors are easiest to process while backward anaphors require holding the pronoun in memory and going back to it".

Some general questions will be posed in all chapters of analysis (Chapters 3 through 6) in this study. They concern the comparisons of the results of the different groups of informants that participated in the project. They are:

- Are there any differences between the *core group* and the *control groups* in all of the cases mentioned in the above-stated questions?

- Are there *universal developmental strategies* and/or *language-specific strategies* that the children use?

- Can any influences of *transfer* be found?

3.3 EXPERIMENTS

3.3.1 Experimental setting

Two experiments have been constructed in such a manner that they might answer (some of) the questions posed in the previous section. The first experiment is an oral task. It is a 'one sentence-four pictures' matching task with a focus on the difference between the bound anaphor 'himself' and the free anaphor 'him.' This experiment has been conducted in Moroccan Arabic and Dutch with the core group of Moroccan children in the Netherlands, in Dutch with the Dutch control

group, and in Moroccan Arabic with the Moroccan control group. Informants of all age groups involved participated several times (cf. data collection schedule in Chapter 2).

The second experiment is a reading task. In order to find out whether the informants were able to apply the knowledge they have of anaphoric reference, we constructed a reading experiment in which the informants had to establish the right antecedent to anaphoric referents. We added a number of different types of reference to find out what the determining factors were in processing this reference.

Two versions of a booklet were constructed, containing 8 short stories each. After each story, there was one question with four possible answers (multiple choice) of which only one was correct. The focus of this task was the difference in difficulty in processing different types, distance and order of reference.

This task was only conducted in Dutch. A reading task in Moroccan Arabic is not possible because these children do not master a written code of this language. The fact that the children would have had severe problems with the orthography would have influenced the results in an undesirable way. Therefore, the Moroccan control group did not participate in this part of the study. Moreover, only the 8 to 10-year-olds participated, because the younger ones have not yet acquired the skill of comprehensive reading. For practical reasons, the classmates of the core informants and of the Dutch control group also participated in this experiment. This is a group with a variety of different nationalities that will be considered as an additional control group for this part of the study.

3.3.2 Oral anaphoric reference task

In the following sections the construction of the oral experiment (3.3.3) will be discussed, as well as the data collection, processing and analysis (3.3.4). We will look into the correct scores (3.4.1) and the distribution patterns of the errors (3.4.2). These results will be discussed for the different groups that participate in this project, i.e., the bilingual group of Moroccan children in the Netherlands, the control group of Dutch children in the Netherlands, and the control group of Moroccan children in Morocco. Comparisons for Dutch will be made between the first and the second group, and for Moroccan Arabic between the first and the third group.

3.3.3 Construction of the task

Two oral anaphoric reference tasks were developed, one in Moroccan Arabic and one in Dutch, based on the experiment on sentence-internal anaphors Deutsch, Koster & Koster (1986) conducted with monolingual Dutch children. The tasks consisted of 24 short sentences each. Three factors were systematically varied in the test sentences: (1) type of anaphor, (2) selected verb, and (3) potential antecedent.

The sentences either contained a bound, reflexive anaphor (Moroccan Arabic and Dutch equivalents of *himself*) or a free, non-reflexive anaphor (Moroccan Arabic and Dutch equivalents of *him*):

Moroccan Arabic	***Dutch***	***English equivalent***
ras-u	*zich*	himself
-u (suffix)	*hem*	him

In Moroccan Arabic the noun *ras* (literally: head) + possessive suffix *-u* signifies a reflexive action (in some regions of Morocco *nefs* or *ruḥ* (literally: soul, spirit) + possessive suffix *-u*). The third person singular masculine form of 'himself' in Moroccan Arabic that was used in this task, is *ras-u* (literally: his head). The pronoun 'him' is expressed by means of the suffix *-u*.

Furthermore, six verbs that can express both reflexive and non-reflexive actions in both Moroccan Arabic and Dutch, were carefully selected. Based on the experiences of Deutsch et al. (1986), a one sentence-four pictures matching task was constructed. Therefore, it was necessary to find action verbs that could be visualized in pictures as well. The following verbs met all of these conditions:

Moroccan Arabic	***Dutch***	***English equivalent***
ka-ye-ġsel	*wassen*	to wash
ka-y-xebbeš	*krabben*	to scratch
ka-y-dafeϵ ϵla	*verdedigen*	to defend
ka-ye-qreṣ	*knijpen*	to pinch
ka-ye-rbeṭ	*vastbinden*	to tie up
ka-y-fekk	*bevrijden*	to release

In Moroccan Arabic the durative aspect of the verb is characterized by prefixing the particle *ka-* or *ta-* to the imperfect form[1] of the verb. The prefix to denote third person singular masculine in the imperfect form is *y(e)-*. *ϵla* is a preposition denoting *on, upon, over, against, to, about,* and collocates with *ka-ydafeϵ*, expressing the meaning *to defend.*

Two invented friends, named *Martijn* (a Dutch boy's name) and *Karim* (a Moroccan boy's name), served as potential antecedents for the anaphoric pronouns. They were referred to as *the friend of Karim* and *the friend of Martijn* respectively:

[1] For a more elaborate and thorough description of the different verb forms in Moroccan Arabic, see Chapter 6.

Moroccan Arabic	*Dutch*	*English equivalent*
ṣaḥeb Karim	*de vriend van Karim*	the friend of Karim
ṣaḥeb Martijn	*de vriend van Martijn*	the friend of Martijn

(7) and (8) are examples of test sentences that were used in the experiment (for the complete tasks in Moroccan Arabic and Dutch, see Appendix I):

(7) Moroccan Arabic: *ṣaḥeb Karim ka-yeqreṣ ras-u*
Dutch: *de vriend van Karim knijpt zich*
English equivalent: the friend of Karim pinches himself

(8) Moroccan Arabic: *ṣaḥeb Karim ka-yqerṣ-u*
Dutch: *de vriend van Karim knijpt hem*
English equivalent: the friend of Karim pinches him

3.3.4 Data collection, processing and analysis

The task was administered to the informants in the two languages during different sessions by native speakers of Moroccan Arabic and Dutch. The test sentences were read out loud while 4 pictures were shown at the same time. Only one picture matched the test sentence. The other three pictures showed actions that differed systematically from the 'right' picture:

• One picture shows the right actor but the wrong action. If the informant chooses this picture, (s)he mixes up the difference between a reflexive and a non-reflexive action, in other words: between the meaning of the bound and the free anaphor. This is referred to as an *anaphoric error.*

• Another picture shows the wrong actor but the right action. If the informant chooses this picture, (s)he takes Martijn for Karim or the other way around: the wrong antecedent is chosen. This is called an *antecedent errror.*

• The third picture shows the wrong actor as well as the wrong action. This is a combination of the two mentioned errors and is referred to as a *double error.*

The child was asked to point to the picture that matched the sentence. The performances of the informants were written down according to the following coding devices:

1 for correct answer
2 for antecedent error
3 for anaphoric error
4 for double error

With this way of coding, statistical analysis could be carried out on the results, both on the correct scores and on the different error types. The differences in scores on the different types of anaphors as a function of age and linguistic background were tested for significance. Analyses of Variance (ANOVAs) with repeated measures have been carried out in order to test the main effects of the following factors:

Principle	(items with a bound anaphor vs. items with a free anaphor)
Time	(informants aged 4 vs. 5 vs. 6 vs. 7 and informants aged 8 vs. 9 vs. 10)
Language	(L1 vs. L2 for the core group)
Ethnic Group	(bilingual group vs. monolingual Dutch control group)
Country	(bilingual group vs. monolingual Moroccan control group).

3.3.5 Reading task on anaphoric reference

In the following sections the construction of the reading experiment will be discussed (3.3.6), as well as the data collection processing and analysis (3.3.7). We will discuss the results in 3.4.3. These results will again be discussed for the different groups that participate in this part of the project, i.e., the bilingual group of Moroccan children in the Netherlands, the control group of Dutch children in the Netherlands and the additional control group of classmates of these children with all kinds of different nationalities. Comparisons will be made between these different groups.

3.3.6 Construction of the task

Derived from Barnitz (1979) eight stories were used in which three factors were used to manipulate the stories:

- *Referent type* (noun or noun phrase vs. clause or sentence)
- *Referent distance* (intrasentential vs. intersentential)
- *Reference order* (forward reference -pronoun follows referent- vs. backward reference -pronoun precedes referent-)

Each story was followed by a multiple choice question with four possible answers. One answer was correct, one completely wrong (referent not present in the story), and two answers served as distractors (distractor referents present in the story). All stories are to be found in Appendix II. We give one example here:

> Ricardo was free on Monday while his mother was working. Mother wanted him to have finished painting the gate. When she came home for dinner, she was very upset because he still hadn't started with it. Instead of that he had fixed the tyre of his bike and his radio. His mother did not like it.

What had Ricardo not done yet when his mother came home?
O fix the tyre of his bicycle.
O fix his radio.
O paint the gate.
O go to school.

In this example, the referent is a clause, 'paint the gate,' the reference order is forward, because 'it' follows the referent 'paint the gate,' and the reference is intersentential. The stories were designed according to the following schedule: story 1 of version A and story 1 of version B were quite similar, but with different reference orders, which required only a minor change in the story.

Version A	*Referent type*	*Referent distance*	*Reference Order*
story 1	sentence	intersentential	forward
story 2	noun phrase	intrasentential	forward
story 3	sentence	intrasentential	forward
story 4	sentence	intersentential	backward
story 5	noun phrase	intrasentential	backward
story 6	noun phrase	intersentential	backward
story 7	sentence	intrasentential	backward
story 8	noun phrase	intersentential	forward

Version B	*Referent type*	*Referent distance*	*Reference Order*
story 1	sentence	intersentential	backward
story 2	noun phrase	intrasentential	backward
story 3	sentence	intrasentential	backward
story 4	sentence	intersentential	forward
story 5	noun phrase	intrasentential	forward
story 6	noun phrase	intersentential	forward
story 7	sentence	intrasentential	forward
story 8	noun phrase	intersentential	backward

3.3.7 Data collection, processing and analysis

This reading task on anaphoric reference was administered to the informants six times over a period of 3 years, i.e., with intervals of 6 months:

version A: spring 1991, version B: fall 1991
version A: spring 1992, version B: fall 1992
version A: spring 1993, version B: fall 1993

The core group for this experiment consisted of 19 of the 25 Moroccan informants, aged 8 at the first moment of data collection. Of these 19, there were 9 boys and 10 girls. Because of illness of some children and other reasons of absence, not all children of the core group participated in every moment of data

collection. Only those children who participated all six times are included in this section. There were two control groups: first, 15 of the 25 informants of the Dutch control group, and second, 64 of their classmates, with a variety of different ethnic-cultural backgrounds (additional control group).

The task was administered to the informants in their own classroom by their own teacher. There is one example story in each booklet and the teacher explained that they were supposed to read the story carefully, turn the page, read and answer the question. They were not allowed to re-read the story once they had seen the question. This example was practised at class level. The informants were allowed to take all the time they needed. The task usually took about 15 minutes.

For this experiment a binary scoring procedure was used where:

1 stands for the correct answer, and
0 stands for an incorrect choice (wrong answer, left blank or more than one answer chosen).

The mean correct scores were calculated and by means of different analyses of variance with repeated measures, the effects of the following factors were determined for the different groups involved:

Time	(time 1 vs. time 2 vs. time 3 vs. time 4 vs. time 5 vs. time 6)
Ethnicity	(Moroccan vs. Dutch vs. Other)
Type of referent	(noun (phrase) vs. sentence/ clause)
Distance of referent	(intersentential vs. intrasentential)
Order of reference	(forward vs. backward)

3.4 RESULTS

In the following sections the results of the two experiments will be presented. For the oral experiment we will look at both the correct scores (3.4.1) as well as the error patterns that emerge from the results (3.4.2). Section 3.4.3 shows the results of the reading experiment. The results will be discussed in Section 3.5.

3.4.1 Correct scores of the oral anaphoric reference task

First of all the correct scores of the bilingual Moroccan children, the core group, will be presented, divided by principle (A for correct scores on items with a bound anaphor and B for correct scores on items with a free anaphor) and language (L1, Moroccan Arabic and L2, Dutch). In addition, the scores of the monolingual Dutch children will be given and a comparison with their scores and the scores of the core group will be made. Finally, in Section 3.4.1.3, the results

of the Moroccan children in Morocco will be shown, also in comparison with the scores of the core group in Moroccan Arabic.

3.4.1.1 Bilingual group in the Netherlands

Moroccan Arabic

For the scores of the core group on this task (Table 3.1) in Moroccan Arabic, it is clear that the correct scores on items with the bound anaphor 'himself' (principle A) of the informants aged 4 lie around chance level: the informants have 4 pictures to choose from. This means there is a chance of 1 in 4 (25%) they will choose the right one, even if they have no understanding whatsoever of the items presented to them. From age 7 on they leap forward to a 94% correct score at age 10. The development of correct scores on items with the free anaphor 'him' (principle B) shows a more gradual course, beginning at 32% correct at age 4 up to 82% correct at age 10. The development on bound anaphors is more rapid; from age 8 on, the informants even perform better on these items than on items with a free anaphor.

An ANOVA (analysis of variance) with repeated measures and Principle and Time as main effects showed that the factor Principle is significant ($F(1,24)=21.13$, $p<.001$) in case of the older children (8 to 10 years), though no significance for this factor could be established for the younger children (4 to 7 years). Time turned out to be a significant factor for both age groups ($F(3,72)=22.64$, $p<.001$ for the younger children and $F(2,48)=16.36$, $p<.001$ for the older children), indicating that the older the children get, the better they perform. Although there was no two-way interaction between the factors Time and Principle *within* the two age groups, some change does take place *between* them. There is a clear tendency, for the L1 of the informants, that bound anaphors are acquired more rapidly and free anaphors more gradually.

Table 3.1 Mean correct scores (%) of the bilingual group in the Netherlands (N=25)

	Moroccan Arabic		***Dutch***	
Age	***Principle A bound anaphor***	***Principle B free anaphor***	***Principle A bound anaphor***	***Principle B free anaphor***
4	27	32	16	35
5	29	38	20	40
6	52	51	32	38
7	52	59	42	49
8	72	65	71	70
9	80	63	88	76
10	94	82	93	89

Dutch

In Dutch, the 4- and 5-year-olds performed below chance level (16% and 20% respectively) on items with principle A, whereas the 10-year-olds had a correct score of 93%. Their correct scores on items with principle B (free anaphor) show a more gradual development: from 35% at age 4 to 89% at age 10. This means that, in their L2, as well as in their L1, the younger informants performed better on items with a free anaphor, with a shifting point around the age of 7. After this age, the children start performing better on items with a bound anaphor than on items with a free anaphor. An ANOVA on the results in Dutch of these informants shows that the factor Principle turned out to be significant ($F(1,24)=24.32$, $p<.001$ for the younger informants and $F(1,24)=9.76$, $p=.005$ for the older ones) as well as the factor Time ($F(3,72)=12.42$, $p<.001$ and $F(2,48)=31.80$, $p<.001$ respectively). This indicates that there was a significant difference between the correct scores on principle A and B for both age groups and that, in general, the children performed better as they got older. As for the results in Dutch, there was no significant two-way interaction for Time and Principle ***within*** both age groups. Here again there is, however, a difference ***between*** the age groups, i.e., the older informants performed best on items with a bound anaphor and the younger ones on items with a free anaphor.

Comparison between L1 and L2 performance

In an ANOVA on the difference between the correct scores in L1 and L2, the factor Language turned out to be a significant factor in both age groups ($F(1,24)=30.78$, $p<.001$ and $F(1,24)=9.95$, $p=.004$ respectively). This means that there was a significant difference between the scores in L1 and L2: the younger children performed significantly better in Moroccan Arabic; for the older children this difference vanished for items on bound anaphors and became the opposite for items with a free anaphor (significantly better scores in Dutch than in Moroccan Arabic).

3.4.1.2 Dutch control group

Monolingual children

For the Dutch children we found a more rapid development for items with bound anaphors (from 21% correct at age 4 -below chance level- to 91% at age 10) than on items with a free anaphor (from 28% correct at age 4 to 91% correct at age 10), as is shown in Table 3.2.

Table 3.2 Mean correct scores (%) of the Dutch control group (N=25)

Age	*Principle A bound anaphor*	*Principle B free anaphor*
4	21	28
5	29	42
6	41	51
7	64	59
8	72	73
9	85	85
10	91	91

Here, however, the factor Principle did not turn out to be significant in the analysis of variance. This means that although there was a difference between the scores on the two types of item, this difference does not justify the conclusion that the processing of one of the two types of item is more difficult than the other. Again the factor Time was significant for both age groups ($F(3,72)=41.81$, $p<.001$ and $F(1,24)=20.87$, $p<.001$ respectively), which was to be expected, as children perform better as they get older. No two-way interaction between the factors Time and Principle was found here.

Comparison between monolingual and bilingual children

An ANOVA on the differences in scores in Dutch of the Moroccan bilingual children on the one hand and the Dutch children on the other showed that there was a significant difference between the scores of the two groups in case of the younger children ($F(1,48)=7.84$, $p=.007$) and also two-way interaction between the factors Ethnic Group and Time ($F(3,144)=4.82$, $p=.003$). This indicates that over time, the two ethnic groups developed differently, i.e., the scores of the Dutch children were higher from age 4 on than those of the Moroccan children. There were no significant differences between the two ethnic groups regarding the scores on principle A vs. principle B.

3.4.1.3 Moroccan control group

The scores of the control group of Moroccan children living in Morocco are presented in Table 3.3. Here we also see that the youngest children (in this case the 5-year-olds) perform best on items with a free anaphor. The difference in the case of the 7-year-olds diminished to 1% and the 9-year-olds performed better on items with a bound anaphor than on items with a free anaphor.

Table 3.3 Mean correct scores (%) of the Moroccan control group (N=25)

Age	*Principle A bound anaphor*	*Principle B free anaphor*
5	38	42
7	49	50
9	71	64

In an Analysis of Variance, the factor Principle did not turn out to be significant. As expected, the factor Age did turn out to be significant ($F(2,72)=15.70$, $p<.001$), showing that the older the children are, the better they perform. There was no significant two-way interaction between Age and Principle, indicating that the patterns of scores on bound and free anaphors did not differ significantly over the age groups.

Comparison between monolingual and bilingual children

Comparing these scores to the scores of the bilingual Moroccan children living in the Netherlands (i.e., we compare the 5-year-olds in the Netherlands to their peers in Morocco and the same for the 7-year-olds and the 9-year-olds), no significant differences were found for the factor Country, nor was there two-way interaction between Principle and Country. The factor Principle turned out to be significant ($F(1,48)=16.22$, $p<.001$) only in the case of the oldest children. This difference was caused by a significant difference of the 9-year-old informants in the Netherlands between scores on bound and free anaphors.

3.4.2 Patterns of error types

To gain a better insight into the strategies children use in performing this task, we wanted to find out whether there were particular patterns of error types to be found. We looked into three different types of errors: the antecedent error, the anaphoric error and the double error. An antecedent error occurred when the child chose the picture with the right action, but the wrong actor. For sentence (7), the picture showing Karim washing himself meant an antecedent error. And in the case of sentence (8), the picture showing Karim pinching Martijn meant an antecedent error as well.

(7) The friend of Karim washes himself

(8) The friend of Karim pinches him

We referred to an error as anaphoric when the child chose the picture in which the right actor was shown, but the wrong action. This means that for sentence (9), the picture in which Karim defends Martijn was chosen, and for sentence (10), the picture showing Karim releasing himself.

(9) The friend of Martijn defends himself

(10) The friend of Martijn releases him

In the case of a double error, the picture that showed the wrong action and the wrong actor was chosen by the informant. For example, the child chose the picture where Karim scratches himself for sentence (11) and the picture in which Martijn ties Karim up for sentence (12).

(11) The friend of Karim scratches him

(12) The friend of Martijn ties himself up

3.4.2.1 Bilingual group in the Netherlands

Table 3.4 shows the distribution of errors the Moroccan core informants made in Moroccan Arabic and in Dutch (A= items with a bound anaphor, B= items with a free anaphor). Separate ANOVAs with repeated measures were conducted for each of the error type scores.

Table 3.4 Mean errors (%) of the bilingual group in the Netherlands (N=25)

Language	*Moroccan Arabic*						*Dutch*					
Error type	*antec.*		*anaph.*		*double*		*antec.*		*anaph.*		*double*	
Principle / *Age*	*A*	*B*	*A*	*B*	*A*	*B*	*A*	*B*	*A*	*B*	*A*	*B*
4	17	34	28	13	28	21	16	33	37	11	31	21
5	37	42	16	8	18	12	22	38	28	9	30	13
6	21	29	14	14	13	5	27	38	18	15	23	9
7	24	27	13	10	11	4	21	31	23	14	14	7
8	11	20	11	11	6	4	5	15	18	13	6	1
9	12	17	5	15	3	4	4	12	6	9	2	3
10	3	10	2	7	1	1	2	6	4	5	0	0

Moroccan Arabic

We see that for *Moroccan Arabic* most of the *antecedent errors* were made on items with principle B. This means the informants had difficulty in establishing the right actor when the sentence was of the type 'the friend of Karim pinches him.' Principle turned out to be a significant factor for all children ($F(1,24)=42.77$, $p<.001$ for the informants aged 4 to 7 and $F(1,24)=8.16$, $p=.009$) for those aged 8 to 10). This means that there was a significant difference between the amount of antecedent errors made on items with a free or a bound anaphor, i.e., errors on items with a free anaphor occurred significantly more

often. Time was also significant for all children ($F(3,72)=8.58$, $p<.001$ and $F(2,48)=9.96$, $p<.001$ respectively). This means that, for almost all groups, there was a significant decrease in antecedent errors over time. There was no significant two-way interaction between the factors Time and Principle. Hence the distribution of errors over the two types of item did not change as the children got older. They continued to make most antecedent errors on items with a free anaphor.

As regards *anaphoric errors*, the opposite is true for the younger informants: most of the errors concerned items with a bound anaphor. This means the informants had difficulty in establishing the right action in sentences of the type 'the friend of Karim pinches himself.' The older children, however, showed the same pattern as they did in the case of the antecedent errors. The factor Principle turned out to be significant for both age groups ($F(1,24)=11.45$, $p=.002$ and $F(1,24)=6.79$, $p=.016$ respectively). This indicates that the youngest group made significantly more anaphoric errors on items with a bound anaphor than on items with a free anaphor. For the older group the pattern was the opposite. Statistical analysis showed that there was no two-way interaction between Time and Principle. This absence of interaction tells us that the distribution of anaphoric errors over principles A and B did not change significantly over time *within* the age groups.

The *double error* is only interesting where it concerned the informants aged 4 to 7. The informants of the older group hardly made any double errors, neither on items with the free anaphor 'him,' nor on items with the bound anaphor 'himself.' For the younger group the factors Principle and Time were both significant ($F(1,24)=27.85$, $p<.001$ and $F(3,72)=26.10$, $p<.001$ respectively). Hence, they made significantly more double errors on items with a bound anaphor and the total of errors diminished over time. No two-way interaction between these factors could be established; the distribution pattern of double errors over the two types of item did not change over time.

Dutch

In *Dutch*, the same pattern of distribution of *antecedent errors* over the two types of item becomes evident. By far most of the antecedent errors were made on items with the free anaphor 'him.' For both age groups, the factor Principle turned out to be significant ($F(1,24)=45.01$, $p<.001$ and $F(1,24)=18.66$, $p<.001$ respectively). Time was only a significant factor for the 8- to 10-year-olds ($F(2,48)=8.18$, $p=.001$), which tells us that the number of antecedent erors the younger children made, did not diminish significantly over time. There was no two-way interaction between Time and Principle, hence the distribution of errors stayed the same over time.

The distribution of *anaphoric errors* shows a different pattern, which, again, is quite similar to the distribution of anaphoric errors in Moroccan Arabic: the younger children clearly made significantly (factor Principle: $F(1,24)=42.44$, $p<.001$) more anaphoric errors in the case of items with a bound anaphor and the

older children showed a more diverse pattern that displayed no significance for the factor Principle. Time, however, was significant for both age groups ($F(3,72)=2.80$, $p=.046$ and $F(2,48)=15.87$, $p<.001$), indicating a clear decrease of anaphoric errors over time. For the younger children, two-way interaction between Time and Principle could be established ($F(3,72)=6.77$, $p<.001$). This tells us that the distribution of anaphoric errors changed over time in the case of the 4- to 7-year-olds: the errors on items with a bound anaphor diminished rapidly, but the anaphoric errors on items with a free anaphor stayed the same and even seemed to increase slightly.

A closer look at the *double errors* made in Dutch by the Moroccan bilinguals, shows that they occurred more often on items with a bound anaphor than on items with a free anaphor. The number of double errors decreased rapidly over time. For the younger children, the factor Principle was significant ($F(1,24)=44.07$, $p<.001$), as was the factor Time ($F(3,72)=12.56$, $p<.001$). No two-way interaction between these factors could be found. This means that the children made more double errors on items with the bound anaphor 'himself.' We also see that by the age of 7, the number of double errors had decreased considerably, but also at this age the informants made most double errors on items with a bound anaphor. The double errors made by the older children did not show a clear distribution in that they occurred significantly more often on one of the two items. They did diminish significantly over time, though (factor Time: $F(2,48)=4.40$, $p=.018$), and the distribution over time also changed significantly (two-way interaction between the factors Time and Principle: $F(2,48)=6.09$, $p=.004$) in that at the age of 8 most double errors were made on items with a bound anaphor, whereas the opposite was true at age 9 and there were no more double errors at age 10.

Comparison between L1 and L2 performance

When *comparing* the results of the Moroccan bilinguals in their L1 on the one hand and their L2 on the other, it appears that the factor Language mainly played a significant role in the case of the *younger informants.* For *antecedent errors* there was two-way interaction between the factors Language and Time ($F(3,72)=7.70$, $p<.001$). This means that the 4- and 5-year-old children made more antecedent errors in Moroccan Arabic than in Dutch and at a later age (6- and 7-year-olds) the opposite was true: most of the antecedent errors they made were in Dutch. There was also two-way interaction between the factors Language and Principle ($F(1,24)=5.65$, $p=.026$); therefore, the difference between antecedent errors on items with a bound anaphor on the one hand and on items with a free anaphor on the other was greater in Dutch than in Moroccan Arabic. For the *anaphoric errors*, some significant differences involving the factor Language were established as well in the case of the younger informants: the factor Language turned out to be significant ($F(1,24)=17.32$, $p<.001$), indicating that most of the anaphoric errors were made in Dutch. And there was two-way interaction between the factors Language and Principle ($F(1,24)=10.45$, $p=.004$). This interaction

showed that, also here, the difference between anaphoric errors on items with bound anaphors on the one hand and items with free anaphors on the other, was greater in Dutch than in Moroccan Arabic. For the *double error*, Language also turned out to be significant ($F(1,24)=20.00$, $p<.001$), telling us that most of the double errors were made in Dutch. Two-way interaction between Language and Principle ($F(1,24)=6.47$, $p=.018$) showed that also in the case of double errors, the difference between the errors on items with a bound anaphor on the one hand and a free anaphor on the other was greater in Dutch than in Moroccan Arabic.

For the *older children*, the factor language did not turn out to play a significant role as often as was the case for the younger children. In the case of *antecedent errors*, the factor Language was significant ($F(1,24)=13.87$, $p=.001$): most of these errors were made in Moroccan Arabic. And for the *anaphoric error* two-way interaction between the factors Language and Time was established ($F(2,48)=3.69$, $p=.032$), indicating that for Moroccan Arabic, most anaphoric errors were made on items with a free anaphor, whereas for Dutch the case was different: the 8-year-olds made most anaphoric errors on items with a bound anaphor and the 9- to 10-year-olds made most anaphoric errors on items with a free anaphor. In the case of *double errors*, no significant effects whatsoever involving the factor Language were found for the older informants.

3.4.2.2 Dutch control group

The distribution of errors made by the control group of Dutch children is shown (in percentages) in Table 3.5. In this section, the significant differences regarding the three types of errors will be discussed. Then a comparison will be made between the error distribution of the Dutch group in Dutch and of the Moroccan core group in Dutch.

Table 3.5 Mean errors (%) of the Dutch control group (N=25)

Error type	*antecedent*		*anaphoric*		*double*	
Principle / *Age*	*A*	*B*	*A*	*B*	*A*	*B*
4	22	35	27	20	31	17
5	17	32	29	17	25	9
6	12	25	33	16	14	8
7	10	16	17	22	9	3
8	7	12	17	13	4	2
9	6	7	8	6	1	2
10	4	6	5	2	0	1

For the Dutch informants aged 4 to 7, the factor Time played a significant role ($F(3,72)=12.87$, $p<.001$) in the case of *antecedent errors*, and so did the factor Principle ($F(1,24)=30.50$, $p<.001$), in that the number of antecedent errors decreased over time and that there were more antecedent errors on items with a

free anaphor than on items with a bound anaphor. For the 8- to 10-year-olds, only the factor Time turned out to be significant ($F(2,48)=3.21$, $p=.049$), in that the children performed better as they grew older. For this age group, Principle was not a significant factor, so the difference between antecedent errors on items with a bound anaphor on the one hand and a free anaphor on the other was not a significant one. Also there was no two-way interaction between these factors.

Regarding the *anaphoric errors*, it turned out that there was two-way interaction between the factors Time and Principle ($F(3,72)=3.42$, $p=.022$) for the younger informants, and that the factor Time turned out to be significant ($F(2,48)=14.49$, $p<.001$) for the older children. This interaction indicates that the distribution of anaphoric errors over the two types of item changed over time; at first, the informants made more anaphoric errors on items with a bound anaphor and as they grew older they made more anaphoric errors on items with a free anaphor. The fact that the factor Time turned out to be significant tells us that the 10-year-olds performed significantly better than the 8-year-olds: they made fewer anaphoric errors.

In the case of *double errors*, the factor Time was significant for both age groups ($F(3,72)=35.10$, $p<.001$ and $F(2,48)=5.91$, $p=.005$ respectively), so the informants made fewer errors as they grew older. For the younger informants the factor Principle also turned out to be significant ($F(1,24)=21.20$, $p<.001$) as did the interaction between the factors Time and Principle ($F(3,72)=3.53$, $p=.019$). They made significantly more double errors on items with a bound anaphor than on items with a free anaphor and, over time, the decrease in double errors on items with a bound anaphor was more rapid than the decrease in these errors on items with a free anaphor.

Comparison between monolingual and bilingual children

A comparison between monolingual and bilingual informants shows the following results. In the case of *antecedent errors*, the factor Ethnic Group was significant ($F(1,48)=13.02$, $p=.001$); the Moroccan informants in the Netherlands (aged 4 to 7) made more antecedent errors than the Dutch children in the same age group. Two-way interaction between the factors Ethnic Group and Time was also found to exist ($F(3,144)=7.67$, $p<.001$). This indicates that the amount of antecedent errors made by the Dutch children decreased over time and that for the Moroccan children the opposite is true: they made more antecedent errors as they grew older. For the older group no significant effects were found for the factors Ethnic Group and Time. This means that there was not much difference between the 8- to 10-year-old Moroccan and Dutch children with respect to the distribution of antecedent errors over the two types of item, and over time.

As far as the distribution of *anaphoric errors* is concerned, the only significant outcome that was found was three-way interaction of the factors Ethnic Group, Time and Principle for the group of younger children ($F(3,144)=5.04$, $p=.002$). This interaction was the result of an extremely diverse error distribution pattern; if we compare the errors made by the Moroccan children in Dutch to

those of the Dutch children, we find that the Moroccan children made more anaphoric errors on items with a bound anaphor than on items with a free anaphor. The Dutch children also showed this tendency, except for the 7-year-olds. The difference between the amount of anaphoric errors on items with a bound anaphor on the one hand and items with a free anaphor on the other is greater in the group of Moroccan children; the Moroccan children made less errors on items with a free anaphor, whereas the number of errors on items with a bound anaphor made by the Moroccan informants on the one hand and the Dutch informants on the other are more or less equal.

In the case of *double errors*, the only significant factor that was found was Ethnic Group ($F(1,48)=7.04$, $p=.011$) for the younger informants; the Moroccan children made more double errors than the Dutch children.

3.4.2.3 Moroccan control group

The distribution of errors made by the control group of Moroccan children in Morocco is presented in Table 3.6. If all three error types are taken into consideration separately, the factor Principle only turned out to be significant for the 9-year-olds when antecedent errors were involved ($F(1,24)=7.64$, $p=.011$); they made significantly more antecedent errors on items with a free anaphor than on items with a bound anaphor.

Table 3.6 Mean errors (%) of the Moroccan control group (N=25)

Error type	*antecedent*		*anaphoric*		*double*	
Principle / *Age*	*A*	*B*	*A*	*B*	*A*	*B*
5	36	44	14	8	12	6
7	35	38	7	6	8	6
9	21	33	6	2	3	1

I making a comparison between the differences in performance over age, it should be kept in mind that the data collection in Morocco was based on a cross-sectional design. The data collected in the Netherlands was (partly) longitudinal, in that data were collected from the 4-year-olds at one-year intervals on four separate occasions, and from the 8-year-olds at one-year intervals on three occasions. This must be kept in mind at all times, when making a comparison between age in the Moroccan control group and also when comparing the performances in Moroccan Arabic of the Moroccan core group in the Netherlands and the Moroccan control group in Morocco.

In comparing the different age groups we have chosen to introduce the factor Grade. Had we called this factor Age this might have suggested that we were dealing with a repeated measurement, which is not the case in a cross-sectional design. We obtained the following results. With respect to *antecedent*

errors, the factor Grade was a significant one (F(2,72)=6.00,p=.004), i.e. there was a significant decrease of errors over grade. The factor Principle also turned out to be significant (F(1,72)=7.80, p=.007). There were significantly more antecedent errors on items with a free anaphor than on items with a bound anaphor. No two-way interaction was found between these two factors, indicating that the error distribution over the two different types of item was the same for each of the three grades.

With respect to *anaphoric errors*, the factors Grade and Principle both turned out to be significant; again no significant interaction was found between the two factors themselves (F(2,72)=6.72, p=.002 and F(1,72)=5.66, p=.020 respectively). The first result indicates that there was a significant decrease of errors over grade and the second suggests that there were significantly more anaphoric errors on items with a bound anaphor than on items with a free anaphor.

Similar observations can be made with respect to *double errors*; the statistical significance of the factor Grade (F(2,72)=7.96, p=.001) implies a significant decrease of errors over grade, and the fact that the factor Principle turned out to be significant (F(1,72)=5.16, p=.026) means that there were significantly more anaphoric errors on items with a bound anaphor than on items with a free anaphor.

Comparison between monolingual and bilingual children

In *comparing* the results of the Moroccan children in the Netherlands (that is, the 5-year-olds, 7-year-olds and 9-year-olds in the core group) with the results of the control group living in Morocco, the following remarks can be made. With respect to *antecedent errors* there were no significant differences as far as the youngest children were concerned. As far as the 7-year-olds are concerned, the factor Country turned out to be significant (F(1,48)=6.91, p=.011); the control informants in Morocco made a significantly greater number of antecedent errors than the core informants in the Netherlands. For the 9-year-olds the factor Principle turned out to be significant (F(1,48)=11.90, p=.001). This indicates that they made a significantly greater number of antecedent errors on items with a free anaphor than on items with a bound anaphor. This difference is also evident in the other two age groups. However, the differences in distribution of the antecedent errors on items with bound anaphors on the one hand and free anaphors on the other was much smaller, in that the factor Principle did not turn out to be statistically significant in those two cases (7-year-olds and 9-year-olds). Country was also a significant factor for this age group (F(1,48)=8.91, p=.004); the informants in the Netherlands made significantly fewer antecedent errors than the informants in Morocco.

The following results were found with respect to *anaphoric errors*. The factor Principle was significant (F(1,48)=13.14, p=.001) for the youngest children (age 5). This means that they made a significantly greater number of anaphoric errors on items with a bound anaphor than on items with a free anaphor. The

factor Country did not turn out to be significant, so there were no significant differences between the performances of the Moroccan 5-year-olds in Morocco and the Moroccan 5-year-olds in the Netherlands, as far as the distribution of anaphoric errors is concerned. For the 7-year-olds, however, the factor Country did turn out to be significant ($F(1,48)=5.15$, $p=.028$); with respect to anaphoric errors, the 7-year-old informants in Morocco performed significantly better than their siblings in the Netherlands. For the 9-year-olds, the factor Country was again significant ($F(1,48)=6.73$, $p=.013$), indicating that the 9-year-old informants in Morocco made significantly fewer anaphoric errors than the 9-year-olds in the Netherlands. There was also two-way interaction between the factors Principle and Country ($F(1,48)=13.58$, $p=.001$). Here we see a difference in the distribution pattern of errors over the two different types of item in relation to the country the informants live in; the 9-year-old informants in Morocco made the greatest number of anaphoric errors on items with a bound anaphor, while the opposite is true for their peers in the Netherlands who made the greatest number of anaphoric errors on items with a free anaphor.

A statistical analysis of *double errors* showed that the factor Principle is a significant one ($F(1,48)=4.72$, $p=.035$) for the 5-year-olds; they made more double errors on items with a bound anaphor than on items with a free anaphor. The factor Country also turned out to be significant ($F(1,48)=7.33$), $p=.009$) in that the 5-year-old informants in the Netherlands made a significantly greater number of double errors than the 5-year-olds in Morocco. For the 7-year-olds the factor Principle also turned out to be significant ($F(1,48)=7.07$, $p=.011$), again indicating that most of the double errors were made on items with a bound anaphor. For the 9-year-olds no significant factors were found, nor was there any significant interaction between the different factors. This means that, with respect to double errors, there was not much difference between the performances of the 9-year-old informants in Morocco and the 9-year-old informants in the Netherlands.

Overall conclusions based on the results in 3.4.1 and 3.4.2 are presented in Sections 3.5.1 and 3.5.2 below.

3.4.3 Results of the reading task on anaphoric reference

The results of the reading task will be presented in the following sections. The results of the core group (bilingual group in the Netherlands) will be discussed in Section 3.4.3.1. The performances of the Dutch control group and of the additional control group will be dealt with in Sections 3.4.3.2 and 3.4.3.3 respectively. The mean correct scores were computed for all groups as was the effect of the factors Ethnicity, Time, Type, Distance and Order of reference.

3.4.3.1 Bilingual group in the Netherlands

Table 3.7 shows the correct scores in percentages of the bilingual Moroccan informants, divided into Type of anaphor (Sentential vs. Noun Phrase pronominal structure), Distance between anaphor and antecedent (intersentential vs. intrasentential), and Order of reference (forward vs. backward).

Table 3.7 Mean correct scores (%) of the bilingual group in the Netherlands

	Type		*Distance*		*Order*	
	S	***NP***	***Inter***	***Intra***	***FW***	***BW***
time 1	70	58	68	59	62	66
time 2	74	83	79	78	87	70
time 3	93	92	92	93	95	91
time 4	89	91	97	83	93	87
time 5	93	92	96	89	93	92
time 6	97	92	96	93	96	93

Type did not turn out to be a significant factor. This means that there was no significant difference in scores on stories in which the anaphor referred to a clause and on stories in which the anaphor referred to a noun phrase. A significant effect was found for the factor Distance ($F(1,18)=6.88$, $p=.017$); the scores on stories with an intersentential reference were higher than those on stories with an intrasentential reference. Hence, the informants found passages with an anaphoric reference to an antecedent that did not occur in the same sentence significantly easier than passages where reference to an antecedent was located in the same sentence. Time was also a significant factor ($F(5,90)=16.32$, $p<.001$); the informants performed better as they got older.

There was two-way interaction between the factors Type and Distance ($F(1,18)=11.50$, $p=.003$); the scores on stories with sentential pronominal structures and an intersentential reference were much higher than on those with intrasentential references, whereas for stories with noun phrase pronominal structures the opposite was true. Hence the order of difficulty for the combination of these two factors was: S-inter > {S-intra, NP-intra} > NP-inter. With respect to the experiment as a whole the following order of difficulty was found (not all of these differences were statistically significant): S-inter-FW > S-inter-BW > NP-inter-FW > NP-intra-FW > {S-intra-FW, NP-intra-BW} > NP-inter-BW > S-intra-BW.

3.4.3.2 Dutch control group

The results of the Dutch control group are presented in Table 3.8. For this group the factor Type turned out to be significant ($F(1,14)=4.70$, $p=.048$). The children performed significantly better on passages with a reference to a sentence than on passages with a reference to a noun phrase. The factor Distance did not have a

significant effect on the results of the Dutch children. However, the factor Order did have a significant effect (F(1,14)=18.16, p=.001) in that the informants scored significantly higher on stories with forward reference than on stories with backward reference.

Table 3.8 Mean correct scores (%) of the Dutch control group

	Type		*Distance*		*Order*	
	S	*NP*	*Inter*	*Intra*	*FW*	*BW*
time 1	92	82	82	92	92	82
time 2	93	88	93	88	95	87
time 3	98	97	98	97	98	97
time 4	93	92	93	92	100	85
time 5	95	93	92	97	95	93
time 6	97	93	95	95	97	93

There was also significant two-way interaction between the factors Type and Distance (F(1,14)=6.00, p=.028) and three-way interaction between Type, Distance and Order (F(1,14)=4.70, p=.048). The first interaction accounts for the fact that the Dutch informants, like the Moroccan children in the core group, scored higher on stories with a combination of sentential pronominal structure and intersentential reference than on stories with a combination of sentential pronominal structure and intrasentential references. For stories that include noun phrase pronominal structures the opposite was true. Therefore, the resulting hierarchy of difficulty was also S-inter > S-intra and NP-intra > NP-inter. The second interaction allows us to construct the following continuum of statistically significant differences between the different types of sentences (three-way interaction between the factors was found): S-inter-FW > {S-inter-BW, S-intra-FW, NP-inter-FW, NP-intra-FW} > NP-intra-BW > S-intra-BW > NP-inter-BW.

3.4.3.3 Additional control group

The results of this control group are presented in Table 3.9.

Table 3.9 Mean correct scores (%) of the additional control group

	Type		*Distance*		*Order*	
	S	*NP*	*Inter*	*Intra*	*FW*	*BW*
time 1	75	69	72	72	80	65
time 2	81	77	84	74	89	69
time 3	89	83	86	87	89	83
time 4	87	85	88	84	93	79
time 5	96	90	94	92	95	91
time 6	91	90	92	89	93	88

The factor Type turned out to be significant ($F(1,63)=10.74$, $p=.002$); stories with anaphoric reference to a sentence or clause were found to be easier to process than stories with a reference to a noun or a noun phrase. Another significant effect was caused by the factor Distance ($F(1,63)=9.58$, $p=.003$). The informants performed better on passages with intersentential reference than on passages with intrasentential reference.

The factor Order also turned out to be significant ($F(1,63)=62.48$, $p<.001$), in that scores obtained on stories with forward reference were higher than on stories with backward reference. For this group the factor Time was also significant ($F(5,315)=22.68$, $p<.001$). It is expected that the children will perform better on these types of task as they grow older.

Two-way interaction was determined between Order and Time ($F(5,315)=5.26$, $p<.001$) which indicates that the difference between scores on stories with forward reference on the one hand and backward reference on the other became significantly smaller over time, while the scores on stories with forward reference remained higher over time than those on stories with backward reference. Another two-way interaction was found between Type and Distance ($F(1,63)=35.75$, $p<.001$) which results in the following order of difficulty being significant: S-inter > S-intra and NP-intra > NP-inter. Three-way interaction between Type, Distance and Order was also found ($F(1,63)=37.82$, $p<.001$) which suggests the following order of difficulty: S-inter-FW > S-inter-BW > S-intra-FW > {NP-inter-FW, NP-intra-FW} > NP-intra-BW > S-intra-BW > NP-inter-BW.

If we take these *three groups together*, it turns out first of all, that all three factors were significant: Type ($F(1,95)=7.76$, $p=.006$), Distance ($F(1,95)=6.38$, $p=.013$) and Order ($F(1,95)=34.57$, $p<.001$). This means that, on the whole, the children performed best on stories with reference to a *sentence*, on *intersentential* reference, and on *forward* reference. Time was also a significant factor ($F(5,475)=24.62$, $p<.001$). Two-way interaction was found between Time and Order ($F(5,475)=3.46$, $p=.004$); the scores on stories with forward reference increased steadily and reached a "ceiling" at time 3, whereas the scores on stories with backward reference increased rapidly up to and until time 3, dropped at time 4, and increased again at times 5 and 6. Two-way interaction for the factors Type and Distance was also established ($F(1,95)=28.39$, $p<.001$); the informants scored higher on stories with sentential pronominal structures and an intersentential reference than on stories with sentential pronominal structures and an intrasentential reference. For stories with noun phrase pronominal structures, the opposite was true: S-inter > S-intra and NP-intra > NP-inter. Three-way interaction between Type, Distance and Order ($F(1,95)=21.20$, $p<.001$) indicates the following scale of difficulty: S-inter-FW > {S-inter-BW, S-intra-FW, NP-inter-FW, NP-intra-FW} > NP-intra-BW > {S-intra-BW, NP-inter-BW}.

If we *compare* the three groups, Ethnicity is a significant factor ($F(2,95)=4.10$, $p=.020$), i.e. the Dutch control group performed significantly better than the

Moroccan core group and the children of the additional control group. There was two-way interaction, however, between Ethnicity and Time ($F(10,475)=2.64$, $p=.004$). At first, the Dutch control group performed much better than the additional control group, which in turn performed better than the Moroccan core group. Then the Moroccan core group started performing better than the additional control group, while the Dutch control group still performed best. By the time the groups were tested at times 5 and 6 these differences seemed to have disappeared.

3.5 CONCLUSIONS AND DISCUSSION

The results of the two tasks that were carried out by the different groups of informants in this study showed that there were several principles that played a role in the processing of different forms of anaphoric reference. There were differences between ethnic groups, between performances on L1 and L2 within ethnic groups, and some principles were acquired more quickly over time than others. However, there were also some striking similarities between groups and within groups. The conclusions section will deal with observations regarding the oral experiment on the one hand (with respect to the correct scores as well as the error distribution patterns) and the reading experiment on the other. The results of the oral anaphoric reference task were compared to the results from a study by Aarssen (1996) because of the similarities between the design of that study and the present one. With respect to the reading experiment, a closer look was taken at the results of this study in comparison with the study conducted by Barnitz (1979). The differences between the factors Type, Distance and Order of reference were taken into account.

3.5.1 Oral anaphoric reference task

Correct scores

For the Moroccan bilingual children it can be concluded that the pattern of acquisition of bound anaphors on the one hand and free anaphors on the other was divergent. There was a significant difference in their performances on the two types of anaphor. The youngest children started out performing best on free anaphors; at a later age the opposite was true. This is the case for both the L1 and L2. In Moroccan Arabic they also performed best at first, while at a later age their performances in Dutch were better than those in Moroccan Arabic. This can be explained by the fact that young children already know and have heard of the pronoun 'him' in their input; 89% of monolingual 6-year-olds is presumed to know this pronoun (Koster 1988a:68). The reflexive 'himself' is most probably not a word a 4-year-old will encounter most frequently; 77% of monolingual 6-year-olds is presumed to know the word (Koster 1988a:68). The informants knew that the pronoun 'him' refers to a male person and once they could figure out

who the actor was, they automatically chose the picture where the non-actor was the undergoer (overgeneralisation of 'him') which happens to be the right picture.

At a later age, starting at about 7 or 8 years, the "positive" linguistic rule (x is the only possible antecedent of the bound anaphor) underlying principle A became easier to process than the "negative" linguistic rule (x cannot be the antecedent of y; it can be any other character mentioned before or after y). After the age of about 8, when the linguistic rules underlying the two principles were acquired, the "positive" one was easier to process than the "negative" one, which led to higher scores for bound anaphors than for free anaphors. It can be expected that from age 10 the children will obtain more or less equal scores on both types of anaphor.

The Dutch monolinguals seemed to have acquired the two linguistic rules underlying the principles at a younger age (approximately at age 8) than the bilinguals. They also overgeneralised their knowledge of deictic pronouns at first, which resulted in lower scores on items with bound anaphors than on items with free anaphors. However, from age 8 there were no more significant differences between the scores on the two types of anaphor.

The Moroccan monolinguals obtained results similar to those of the Dutch monolinguals. At a very young age there were hardly any differences between performances on items with a bound anaphor on the one hand and items with a free anaphor on the other.

There was probably some delay in the bilingual children's acquisition of the two rules. They did acquire these rules and they also obtained relatively high scores on the items at a relatively young age. However, if we look at the age where the difference in performance on the two types of item ceases to be statistically significant, we see a delay of about two years in the bilingual children's performance.

Aarssen (1996) found that Turkish 4- to 7-year-old bilinguals performed best on items with a free anaphor, but that the older group obtained equal scores on bound and free anaphor items. He found similar results for the Turkish monolingual control group and the Dutch monolingual control group. It seems the case for this group too that overgeneralisation of the personal pronoun 'him' played a role in the performance of the youngest children. The older children, however, acquired free and bound anaphors in a similar way, without the differences expected on the basis of Binding Theory.

Patterns of error types

One could assume that the informants did not choose pictures randomly whenever they heard a test sentence. This assumption is supported by the distributional patterns of correct scores and errors. If children were to choose the pictures randomly, the correct scores and the scores on the different error types would all have been around 25%, as there are four pictures to choose from, and this was not the case. If the correct pictures were not chosen randomly, the errors might not be distributed randomly either. This would mean that the children used certain

strategies to perform the task, even in those cases where they did not know the correct answer. If we take a closer look at the distribution of errors made on the different types of sentences, it becomes clear that some general conclusions may be drawn. Most antecedent errors were made on items with a free anaphor and most anaphoric errors and double errors were made on items with a bound anaphor. This was true for all ethnic groups and for both languages, be it the first or the second language. Some possible explanations for particular mistakes that children made and possible strategies the children might have used to help them resolve this task, will be presented below. They will be linked to the theories, hypotheses and strategies described in Section 3.2.

If the informants were to have adhered to the *Minimal Distance Principle*, this would have led to them making antecedent errors, equally distributed over both types of item. The theory behind this supposed strategy is not supported by the results of the present study because antecedent errors occurred significantly more often in sentences with a free anaphor than in sentences with a bound anaphor. It is true, however, that most errors made were antecedent errors. It seems the informants found it more difficult to establishing the right antecedent of an anaphor than to determine the difference in meaning of a bound and a free anaphor.

Adherence to the strong version of the *Cognitive Reflexive Strategy*, would have led informants to make antecedent errors only in sentences with a bound anaphor. In sentences with a free anaphor, they would have made anaphoric errors, sometimes in combination with an antecedent error, resulting in a so-called double error. Adherence to the weak version would have resulted in antecedent errors on items with principle A and randomly anaphoric and antecedent errors on items with principle B. Neither the strong or the weak version of this strategy seems to have been adhered by the children in this study.

If the theory of *Lexically Directed Orientation (LDO)* were applicable to the outcomes of this study this would have been reflected in either correct responses or antecedent errors on both types of item. It is true that, if the total number of correct scores plus antecedent errors is compared to the total sum of the other errors (anaphoric and double), the first proportion is higher than the second in 90% of the cases (LDO-subtotal is larger than other-response total). This is reflected in Table 3.10.

However, this pattern is not necessarily the result of the use of an LDO strategy by the children. There is still no answer to the question concerning anaphoric and double errors. If the LDO strategy were to apply, this would result in anaphoric and double errors randomly distributed over items with principle A and principle B, however, this is not the case here. Most anaphoric errors and double errors were made on items with a bound anaphor.

Table 3.10 Sub-total in percentages according to LDO strategy (N=25)

Group	*Bilingual core group*				*Dutch control group*		*Moroccan control group*	
Language	*Mor. Arabic*		*Dutch*		*Dutch*		*Mor. Arabic*	
Principle / *Age*	*A*	*B*	*A*	*B*	*A*	*B*	*A*	*B*
4	44	66	32	68	43	63		
5	66	80	42	78	46	74	74	86
6	73	80	59	76	53	76		
7	76	86	63	80	74	75	84	88
8	83	85	76	85	79	85		
9	92	80	92	88	91	92	92	97
10	97	92	95	95	95	97		

It was also found that the largest difference between performance on principle A and principle B occurred in the youngest age group. The keyword for this group would seem to be *overgeneralisation*. Overgeneralisation (interpreting 'himself' as 'he') would result in mostly anaphoric errors on items with a bound anaphor. This can indeed be supported on the basis of the error distribution in the group of younger children.

All three groups (the core group and the two control groups) that participated in this part of the study showed the same error distribution patterns. It seems the strategies they used are the same in the L1 and the L2, even in this study involving two typologically very different languages. It turned out, however, that the monolinguals performed better than the bilinguals, but this was only the case for the youngest children. By the time the informants reached age 8 this difference had largely disappeared. The only exception was the Moroccan control group whose members made a significantly greater number of antecedent errors than the bilingual group in the Netherlands. This was probably due to a specific characteristic of the task. One of the two boys in the pictures was fair-haired and the other was dark-haired. In the Netherlands the Dutch name Martijn was used for the former and the Moroccan name Karim for the latter. This external feature in combination with the obvious origin of the names turned out to be a very useful cue. In Morocco, however, two Arabic names were chosen (Karim and Khaled), because it was not considered a good idea to teach them a name they were completely unfamiliar with, such as Martijn. As a result, the monolinguals only had the external feature 'clothes' to help them remember which boy was which. Although all children were given ample time to memorize the names, it seems that the memory aid offered to the children in the Netherlands was more effective than the one offered to the children in Morocco. This probably resulted in the fact that a high number of antecedent errors was made by the monolingual Moroccan group.

In conclusion, it seems that the informants used a combination of two "strategies" to process this anaphoric reference task; the youngest children overgeneralised their knowledge of the pronoun 'him.' At a later stage the children acquired the ability to differentiate between self-oriented and other-oriented actions and by the time the children reached the age of 10, they had almost full mastery of all linguistic rules necessary to successfully execute this task on anaphoric reference.

3.5.2 Reading task on anaphoric reference

The Barnitz study

The original experiment conducted by Barnitz (1979) with working-class monolingual English-speaking children aged 8, 10 and 12 was the basis on which the reading experiment was constructed and administered. The age range in this part of the study is 8 to 10 (six moments of testing with intervals of six months, over 3 years). The same kind of stories were used, with the same alternation of the three factors. Barnitz found that stories with reference to a noun phrase were significantly easier than stories with reference to a sentence ($p<.05$). Another significant factor (though "marginally significant" according to Barnitz, 1979:13) was Order, in that forward reference was found to be easier than backward reference ($.05<p<.10$). He also found significant two-way interaction between the factors Type and Distance ($p<.01$) in that intersentential reference to a noun phrase was easier than intrasentential reference to a noun phrase, whereas intrasentential reference to a sentence was easier than intersentential reference to a sentence. There was also three-way interaction between Type, Order and Distance ($.05<p<.10$) indicating the following hierarchy of difficulty: NP-intra-FW > {S-intra-FW, NP-inter-FW, NP-inter-BW} > S-intra-BW > {NP-intra-BW, S-inter-FW, S-inter-BW}.

Comparison Barnitz study and present study

Results from the present study differ considerably from those of the Barnitz study. For the bilingual core group, only the factor Distance turned out to be a significant factor, i.e., scores on stories with intersentential reference were higher than on those with intrasentential reference. There was also a significant effect for Distance for the additional control group. This factor was never significant in the Barnitz study.

For both control groups, the factors Type (reference to a sentence is easier than reference to a noun phrase) and Order (forward reference is easier than backward reference) were significant. The Barnitz study showed an opposite result on Type. For the children in his study, the fact that reference to a sentence is more complex than reference to a noun phrase was more important than the fact that a sentence usually contains more information and is therefore easier to remember.

All groups showed two-way interaction between Type and Distance, but indicated a result (S-inter > S-intra and NP-intra > NP-inter) that is completely

in contradiction with the results of the Barnitz study.

For Order there was a clear outcome. In fact, it was the only outcome that is similar to the Barnitz study. Maybe it is a universal principle that forward reference is easier to process than backward reference.

In conclusion, the only group of informants that already performed well at age 8 and did not differ much from their performance at age 10, was the Dutch control group. For both the Moroccan bilingual group and the additional control group there was a significant effect for the factor Time, which means that they made progress in their performance. The 8-year-old monolinguals had already reached their ceiling whereas for the bilinguals this happened at a later age (performance is comparable around age 10) again indicating that the bilingual children had a delay in comprehension of about 2 years in comparison to the monolinguals.

It is remarkable that both groups that did not have Dutch as a native language (the Moroccan bilingual group and the additional control group of different nationalities) showed a significant effect for the factor Distance, whereas the Dutch monolingual control group did not (and neither did the monolingual group in the Barnitz study). For the bilingual core group and the additional control group, intersentential reference turned out to be easier to process than intrasentential reference. A possible explanation might be that for L2-learners there is too much coindexed information in one sentence. Only with complete knowledge of the linguistic rules involved, this kind of reference can be successfully processed. We witnessed a similar thing in the oral anaphoric reference task, where the bilingual children showed a delay, compared to the monolingual children, in their performance. It is possible that the processing of these syntactically difficult sentences is a skill that they developed at a later age than the monolingual Dutch children. This is because by the time they reached the age of 10, the differences between the three groups had diminished considerably, which was confirmed by significant two-way interaction between Ethnicity and Time.

4 RELATIVE CLAUSES

4.1 INTRODUCTION

In the present chapter the acquisition of relative clauses in Moroccan Arabic and Dutch is examined. We looked into the the bilingual informants' performances and those of the control groups in processing relatively difficult relative clauses. In both Dutch and Moroccan Arabic relative clauses, there is a postnominal pronoun preceding the verb. However, there are also differences between the languages in this linguistic domain. We will explain this in Section 4.3.2., where the construction of the tasks used will be described. The attempts made so far to relate typological differences to sentence processing difficulties underscore the need for cross-linguistic studies on the acquisition of relative clauses.

According to Keenan & Comrie (1977:63), a relative clause can be defined as "any syntactic object specifying a set of objects in two steps: A larger step is specified, called the domain of relativisation, and then restricted to some subset of which a certain sentence, the restrictive sentence, is true. The domain of relativisation is expressed in surface by the head NP, and the restrictive sentence by the restricting clause." From a typological point of view, a distinction can be made between *external* or headed relatives and *internal* relatives, with the head NP outside and inside the restricting clause respectively. External relatives can further be divided into *postnominal* and *prenominal relatives*. Keenan (1985) has shown that there is a general tendency across languages to favour postnominal as opposed to prenominal relative clauses. Postnominal relative clauses are almost uniquely attested in verb-initial languages, and they are very productive in verb-medial languages. Prenominal relative clauses usually occur in verb-final languages, although also here postnominal and internal relative clauses are often dominant.

There is a large body of literature on the processing of relative clauses in various unrelated languages. From such reviews as Hakuta (1981), Clancy, Lee & Zoh (1986) and MacWinney & Pléh (1988), it is clear that several intricately interacting factors determine the processing of relative clauses:

(1) the grammatical role played by the head of the relative clause;
(2) the use of word order configurations in surface structure;
(3) the interruption of processing units;
(4) the use of grammatical markers as cues to processing.

From studies across Indo-European languages (see below), the general finding is that for school-age children sentences in which the head noun is subject in both the main clause and the relativised clause (*ss sentences*) are relatively easy; sentences in which the headnoun is subject in the main clause and object in the relativised clause (*so sentences*) are relatively complex; while sentences in which the head noun is either object in both clauses (*oo sentences*) or object in the main clause and subject in the relativised clause (*os sentences*) take an intermediate position.

4.2 RESEARCH QUESTIONS

Several hypotheses have been developed over the years in studies conducted on this subject. Sheldon (1974) based his hypothesis on a theory stating that the complexity of a sentence depends on the grammatical functions of the head noun. According to this theory, restrictive relative clauses in which the head noun has the same function in the main clause as in the relativised clause are easier to comprehend than sentences in which these functions are different. Sheldon's hypothesis has been called the *Parallel Function Hypothesis* (*ss and oo are easier to process than so and os*).

Another hypothesis, based on the Accessibility Hierarchy theory, was developed by Keenan & Comrie (1977) and states that there is a hierarchy in which languages allow relativisation of noun phrases. The hierarchy is: subject, direct object, indirect object, object of preposition, possessive noun phrase and object of comparative particle. So, if a language allows a certain noun phrase to be relativised, it will also allow all other noun phrases on its left in this hierarchy to be relativised. The assumption that is made on the basis of this theory is that children will find relative clauses more difficult as they move down the hierarchy, so Subject Focus relative clauses will be easier than Object Focus relative clauses. We will refer to this as the *Accessibility Hypothesis* (*ss and os are easier to process than so and oo*).

Hakuta (1981) claims that there is a universal law, derived from different components of other theories, based on left- or right-branching in a particular language. "Hakuta's Law" states that in languages where the head noun is on the left of the relative clause, subject focus will be easier than object focus, whereas in languages where the head noun is on the right of the relative clause, object focus will be easier, all other things being equal. If a language is right-branching, learners will find it easier to deal with a relativised clause that shows the same configuration (if [HN] [RC], then *ss and os are easier to process than so and oo*).

This also holds the other way around: If a language is left-branching, children will find it easier to deal with a relativised clause that shows this configuration (if [RC] [HN], then *so and oo are easier to process than ss and os*).

For the second factor (the use of word order configurations in surface structure) it has been predicted that the unmarked word order will be the easiest to process. Tavakólian (1981) proposed an explanation purely based on the configurational properties of the sentence. She predicts that children will interpret restrictive relative clauses as if they were conjoined, which means that an *ss* sentence would be interpreted correctly and an *os* sentence would not. According to this *Conjoined Clauses Hypothesis*, the *os* sentence would be interpreted as an *ss* sentence in an acting-out task. She makes no asssumptions as regards *so* and *oo* sentences (*ss is easier to process than os*, in the case of *svo* word order).

On the interruption of processing units (factor 3), it has been stated that if processing is interrupted, interpretation will be more difficult than if it is not. According to this hypothesis, there is a universal operating principle, which avoids interruption or re-arrangement of linguistic units. The *Embeddedness Hypothesis* (Slobin 1973) states that relativised clauses that are placed in the middle of a sentence (i.e., when the main clause is interrupted) will be more difficult to comprehend than relativised clauses at the end of a sentence (for Dutch: *os and oo are easier to process than ss and so*; for Moroccan Arabic: *os and oo are easier to process than ss and so* in the case of *svo* word order, and *ss and so are easier to process than os and oo* in the case of *ovs* word order).

Finally, on the use of grammatical markers as cues to processing (e.g., coindexing, agreement), it has been proposed that for languages that make use of grammatical markers, the function of the head noun and the word order are less important than for languages that do not have these devices at their disposal.

On the basis of the above-mentioned studies, the following research questions were posed and kept in mind during the construction of the experimental tasks:

- What is the hierarchy of complexity of the different *sentence types* (i.e., *ss, so, os* and *oo*) in Moroccan Arabic and Dutch and what are the possible explanations for this difference in complexity?

- What is the hierarchy of complexity of the different *word orders* and what are the possible explanations for this difference in complexity?

- What *kinds of errors* do children make when processing relative clauses and are there specific error type patterns to be found?

- What is the *interpretation of the relative clauses* at the time children make errors and are there specific interpretation patterns to be found?

- Are there any differences between the *core group* and the *control groups* in all of the cases mentioned in the above-mentioned questions? Are there *universal developmental stragegies* and/or *language-specific strategies* that the children use? Can any influence of *transfer* be found?

4.3 EXPERIMENT

In the following sections, the experimental setting (4.3.1) will be discussed as well as the construction of the experiment (4.3.2) and the data collection, processing and analysis (4.3.3). We will look both into correct scores (4.4.1) and into the distributional patterns of errors (4.4.2). These results will be discussed for the different groups that participate in this study, i.e., the bilingual group of Moroccan children in the Netherlands, the control group of Dutch children in the Netherlands and the control group of Moroccan children in Morocco. Comparisons for Dutch will be made between the first and the second group and for Moroccan Arabic between the first and the third group.

4.3.1 Experimental setting

Data on the acquisition of relative clauses in typologically different language pairs prove to be very scarce. Hakuta (1981) studied the acquisition of relative clauses in Japanese. By contrasting *sov* and *ovs* word orders in the main clause, he was able to separate the role of the position of the embedding from the grammatical role structure. He found it was not center-embedding that causes problems, but rather the stacking of nouns before the main verb. Slobin (1986) compared the acquisition of relative clauses in Turkish and English. He found relative clauses in Turkish to be much more complex as a consequence of the formation of the embedded clause, which has no finite verb and case inflections like a canonical main clause. MacWhinney & Pléh (1988) investigated the acquisition of relative clauses in Hungarian. They found *ss* sentences to be the easiest and *so* sentences to be the most complex. Moreover, they found evidence for the importance of focus maintenance in the main clause and the relative clause. In a variety of studies, e.g., Jarvella & Herman (1972), Townsend & Bever (1977, 1978), it was suggested that retaining a subordinate clause in memory before processing a main clause puts an added burden on recall memory.

In this chapter, it will be investigated in what order the various types of grammatical relations in relative clauses in Moroccan Arabic and Dutch are acquired. On the basis of previous cross-linguistic research, we predicted that for each of the two languages *ss* sentences would be acquired first, followed by *os* and *oo* sentences and last by *so* sentences. For Moroccan Arabic, the effect of word order on relative clause difficulty was also explored. We predicted that unmarked word order patterns that involve basic grammatical rules would facilitate the children's comprehension of relative clauses.

4.3.2 Construction of the relative clause task

Two tasks were constructed: one in Moroccan Arabic and one in Dutch. Each version consisted of 32 relative clauses, involving six nouns as actors and four verbs as actions. Both versions of the task can be found in Appendix III. The four selected verbs referred to different types of activities and the nouns referred to different animals:

Moroccan Arabic	***Dutch***	***English equivalent***
ka-yeḍreb	*slaan*	to hit
ka-yemseḥ	*aaien*	to stroke
ka-ybus	*kussen*	to kiss
ka-yeqreṣ	*knijpen*	to pinch

Moroccan Arabic	***Dutch***	***English equivalent***
debb	*beer*	bear
sbeϵ	*leeuw*	lion
qerd	*aap*	monkey
mešš	*poes*	cat
kelb	*hond*	dog
far	*muis*	mouse

There are four logically possible sentence types: *ss, so, os* and *oo*. For example, in the English *ss* sentence (1), *the bear* is subject both of the main clause and of the relative clause. In example (2), *the bear* is subject of the main clause and object of the relative clause. In example (3), *the lion* is object of the main clause and subject of the relative clause. And finally, in example (4), *the lion* is object of both clauses.

(1) *ss*	the bear that kisses the monkey strokes the lion
main clause	[**s** v o]
relative clause	[**s** v o]
(2) *so*	the bear that the monkey kisses strokes the lion
main clause	[**s** v o]
relative clause	[**o** s v]
(3) *os*	the bear strokes the lion that kisses the monkey
main clause	[s v **o**]
relative clause	[**s** v o]

(4) *oo*	the bear strokes the lion that the monkey kisses
main clause	[s v **o**]
relative clause	[**o** s v]

In Moroccan Arabic, which has postnominal relative clauses, the same four sentence types are possible. Although the unmarked word order in complex sentences (such as relative clauses) in Moroccan Arabic is *svo*, *ovs* word order is also a possibility, but requires a prestated object and a coreferential pronoun suffixed to the verb (in the main clause):

svo os *s-sbeɛ ka-ye-ḍreb l-qerd lli ka-ye-mseḥ d-debb*
/DET-lion DUR-3SG-hit DET-monkey that DUR-3SG-stroke DET-bear/
the lion hits the monkey that strokes the bear

ovs ss *s-sbeɛ ka-y-ḍerb-u l-qerd lli ka-ye-mseḥ d-debb*
/DET-lion DUR-3SG-hit-PRO3SG-DO DET-monkey that DUR-3SG-stroke DET-bear/
the monkey that strokes the bear hits the lion

For the construction of *so* and *oo* sentences (either in *svo* or in *ovs* word order) a prestated object and a coreferential pronoun suffixed to the verb are required in the relative clause, in the same way as *ovs* word order is constructed in the main clause. These conditions lead to 8 configurations of relative clauses:

svo ss *d-debb lli ka-ybus l-qerd, ka-yemseḥ s-sbeɛ.*
the bear that kisses the monkey strokes the lion.

svo so *s-sbeɛ lli ka-ybus-u l-qerd, ka-yeḍreb d-debb.*
the lion that the monkey kisses hits the lion.

svo os *s-sbeɛ ka-yeḍreb l-qerd lli ka-yemseḥ d-debb.*
the lion hits the monkey that strokes the bear.

svo oo *d-debb ka-yeqreṣ s-sbeɛ lli ka-yḍerb-u l-qerd.*
the bear pinches the lion than the monkey hits.

ovs ss *l-qerd, ka-ymesḥ-u s-sbeɛ lli ka-ybus d-debb.*
the monkey, him strokes the lion that kisses the bear.

ovs so *d-debb, ka-ybus-u l-qerd lli ka-ymesḥ-u s-sbeɛ.*
the bear, him kisses the monkey that the lion strokes.

ovs os *d-debb lli ka-yemseḥ l-qerd, ka-yqerṣ-u s-sbeɛ.*
the bear that strokes the monkey, him pinches the lion.

ovs oo *s-sbeɛ lli ka-ybus-u l-qerd, ka-ymesḥ-u d-debb.*
the lion that the monkey kisses, him strokes the bear.

In relative clauses in Dutch, a postnominal pronoun precedes the verb and only one word order occurs: *svo*. This means that in Dutch, as well as in English, there is a maximum of 4 possible configurations of relative clauses. A complication arises in Dutch *so* and *oo* sentences, where the use of either passive forms, stress, or number agreement is required in order to create these sentences. With the use of passive forms the sentences would have been:

so *de beer die door de aap wordt gekust, aait de leeuw.*
the bear that is being kissed by the monkey strokes the lion.

oo *de beer aait de leeuw die door de aap wordt gekust.*
the bear strokes the lion that is being kissed by the monkey.

The risk of adding another variable to this already complicated experimental task was deemed undesirable, and thus we rejected the idea of using passive forms. In a pilot study, the use of stress had been put to a test and the outcomes were very disappointing. The children did not turn out to be sensitive to this factor at all. The sentences are:

so *de beer die de ááp kust, aait de leeuw*
with stress: the bear that the monkey kisses strokes the lion (*so* sentence)
without stress: the bear that kisses the monkey strokes the lion (*ss* sentence)

oo *de beer aait de leeuw die de ááp kust*
with stress: the bear strokes the lion that the monkey kisses (*oo* sentence)
without stress: the bear strokes the lion that kisses the monkey (*os* sentence)

It was then decided to make use of number agreement in all four sentence types, thus creating the possibility of constructing unambiguous *so* and *oo* sentences. Examples are given below:

ss *de beren die de aap kussen, aaien de leeuw.*
the bears that kiss the monkey stroke the lion.

so *de beren die de aap kust, aaien de leeuw.*
the bears that the monkey kisses stroke the lion.

os *de beer aait de leeuwen die de aap kussen.*
the bear strokes the lions that kiss the monkey.

oo *de beer aait de leeuwen die de aap kust.*
the bear strokes the lions that the monkey kisses.

4.3.3 Data collection, processing and analysis

For the way the data for this experiment were collected, we refer to Section 4.2.1.2. The design we worked with for the experiment on anaphoric reference is the same we work with here. Also here, the experiments were conducted in Moroccan Arabic and Dutch by research assistants that were native speakers of the languages involved. The informants were aged 4, 5, 6 and 7 in the first age group and 8, 9 and 10 in the second age group.

The research assistants first made sure the children were familiar with the names of the animals and the activities to be referred to. The children had toy animals in front of them and were asked to act out each sentence they heard. There was a total of 32 sentences, divided over two sessions (with intervals of at least one week) of 16 sentences. The research assistants documented the exact actions performed by the children, also in cases where they misinterpreted the sentence. Statistical analysis was then performed on the results, i.e., on the correct scores as well as on the different error types. Analyses of variance (ANOVAs) were conducted with the following factors: Sentence Type (*ss* vs. *so* vs. *os* vs. *oo*), Time (informants aged 4 vs. 5 vs. 6 vs. 7 and informants aged 8 vs. 9 vs. 10), Language (L1 vs. L2 for the core group), Ethnic Group (Moroccan vs. Dutch). In cases where comparisons are made between the performances of the core group and the Dutch control group on the other, Country (the Netherlands vs. Morocco) was a factor. Word Order (*svo* vs. *ovs*) was a factor in the case of comparisons between the core group in the Netherlands and the Moroccan control group.

At the end of this chapter we will also have a look at the use of relative clauses in the semi-spontaneous speech that was recorded from these children: narrated stories on the basis of series of pictures. Not many instances of relative clauses were found in these retellings, but nevertheless these observations might tell us something about whether the informants are able to apply the knowledge they have of relative clauses in the production of these clauses.

4.4 RESULTS

In Section 4.4.1.1 the correct scores of the bilingual Moroccan children, the core group, will be presented by sentence type (*ss, so, os, oo*), word order (*svo* and *ovs* for Moroccan Arabic) and language (L1, Moroccan Arabic and L2, Dutch). In the

subsequent section, the scores of the monolingual Dutch children are given and a comparison between their scores and the scores of the core group is made. Finally, in Section 4.4.1.3, the results of the Moroccan children in Morocco are given, also in comparison with the scores of the core group in Moroccan Arabic. For the presentation of the distribution of errors, we refer to Sections 4.4.2.1. through 4.4.2.3.

4.4.1 Correct scores

4.4.1.1 Bilingual group in the Netherlands

Moroccan Arabic

For Moroccan Arabic (Table 4.1), the younger children scored high on *ss* and *os* sentences, compared to the *so* and *oo* sentences. The older children showed a more varied distribution of correct scores.

Table 4.1 Mean correct scores (%) of the bilingual children in Moroccan Arabic (N=25)

	SVO order				*OVS order*			
Age	*SS*	*SO*	*OS*	*OO*	*SS*	*SO*	*OS*	*OO*
4	36	6	15	24	5	6	27	8
5	57	1	6	23	5	2	28	6
6	63	14	12	23	5	16	57	12
7	67	8	13	24	9	15	46	9
8	61	27	46	28	14	10	45	16
9	47	29	51	43	17	12	36	31
10	50	47	61	50	22	19	46	34

The relative clauses in *so* and *oo* sentences require a suffix coindexed to the head noun (see Section 4.3.2). The head noun then becomes a prestated object and the subject is placed after the verb, which is less basic than the *svo* word order for relative clauses. This probably led to a higher level of complexity for the informants. In the sentences with *ovs* word order, this use of a prestated object also has to be applied in the main clause. If we assume that a prestated object is more difficult to comprehend because a poststated object and prestated subject is more basic (*svo* in both main clause and relative clause), it then follows that *ovs-so* and *ovs-oo* sentences must be more difficult to comprehend than *svo-so* and *svo-oo* sentences. That is why we have split up the results of the Moroccan Arabic part of the experiment into scores on *svo* sentences and *ovs* sentences. The first striking phenomenon is the fact that the mean scores on *svo* sentences were much higher than those on *ovs* sentences. This is in conformity with our predictions on comprehension of basic and more complex word order. Secondly, the sentences that were performed best were *ss* sentences in *svo* word order and *os* sentences in *ovs* word order.

For the younger informants, we found many significant factors related to these results. The factor Time ($F(3,72)=9.12$, $p<.001$) is not one to elaborate on, because there was an understandable change (here: improvement) of performance over age. But also Order ($F(1,24)=13.27$, $p=.001$) and Type ($F(3,72)= 21.36$, $p<.001$) were significant factors, signifying that the informants performed higher on *svo* order than on *ovs* order and that the informants obtained high scores on *ss*, *os* and *oo* sentences and performed very low on *so* sentences. A significant interaction between Order and Type ($F(3,72)=87.23$, $p<.001$) indicates that the informants had different interpretation preferences concerning sentence type per order: for *ss* and *oo* sentences in *svo* order and for *os* sentences in *ovs* order. The interaction between Time, Order and Type ($F(9,216)=3.79$, $p<.001$) interestingly shows that there was progress in the interpretation of *svo-ss* sentences and *ovs-os* sentences and that for the other sentence types/orders there was no progress over time whatsoever. This indicates that the scores on these types/orders were on chance level and that this did not change over time. The informants clearly made progress in the understanding of the meaning of the *svo-ss* and *ovs-os* sentences. For the other sentences, the only solution was for them to guess what these sentences meant.

For the older informants, there was a significant Time factor ($F(2,48)=5.49$, $p=.007$) as well as significance for Order ($F(1,24)=57.06$, $p<.001$) and Type ($F(3,72)=7.36$, $p<.001$). These indicate that the informants scored better on *svo* sentences than on *ovs* sentences and that they performed better on *ss*, *os*, and *oo* sentences than on *so* sentences. This result was also found for the younger informants. As for the interactions between the different factors, only the interaction between Time and Type ($F(6,144)= 2.73$, $p=.015$) turned out to be significant. This finding shows that there was hardly any progress in the performance on the *ss* and *os* sentences, but that there was progress for *so* and *oo* sentences. There was a certain ceiling effect for the first two types. The level of comprehension the informants had at age 8 is about the maximum they reached in the age range of 4-11 years. Their performance on the "weaker" sentences, however, showed a certain progress. Although these sentences were difficult to comprehend, the older informants started to understand them better as they got older, an improvement that could not be established for the younger informants.

Dutch

In Table 4.2, the scores on Dutch for the bilingual children are shown. The first thing that attracted the attention were the extremely low scores on *so* sentences. The other obvious first observations that could be made concern the low scores on *os* and *oo* sentences for the younger informants and the fact that the pattern of (high) scores on *ss* sentences and (low) scores on *oo* sentences hardly seemed to change between the ages of 4 and 10.

Table 4.2 Mean correct scores (%) of the bilingual children in Dutch (N=25)

Age	*SS*	*SO*	*OS*	*OO*
4	46	1	8	21
5	64	0	11	17
6	55	0	8	14
7	59	0	3	17
8	62	3	41	15
9	57	13	54	18
10	56	27	68	23

For the younger informants the only significant factor was Type ($F(3,72)=43.90$, $p<.001$), which is also clear from Table 4.2; rather high scores on *ss* sentences and low scores on the other three sentence types. For the older informants, the factor Time ($F(2,48)=11.76$, $p<.001$) turned out to be significant. This was due to the fact that they made some progress on *so, os* and *oo* sentences. Type ($F(3,72)=14.75$, $p<.001$) was also significant in that the older informants performed high on *ss* and *os* sentences and low on *so* and *oo* sentences. There was an interaction between Time and Type ($F(6,144)=3.66$, $p=.002$) indicating that there was hardly any progress for *ss* sentences (in fact, the informants performed worse as they got older) and there as progress for the other three sentence types.

Comparison between L1 and L2 performance

If we make a comparison between the results in L1 and L2, we find that for the younger informants the factor Time ($F(3,72)=3.99$, $p=.011$) remained significant, as does the factor Type ($F(3,72)=36.06$, $p<.001$). The children made progress over time, performing best on *ss* sentences, worst on *so* sentences and somewhere in the middle on *os* and *oo* sentences. The factor Order cannot be analysed here because there was only one order in the Dutch sentences. There was an interaction between the factors Language and Time ($F(3,72)=9.62$, $p<.001$) and Language and Type ($F(3,72)=47.81$, $p<.001$), indicating that, first of all, the children made more progress in Moroccan Arabic than in Dutch. In fact, there was hardly any progress in Dutch, which was also made clear by the fact that the factor Time was not significant for the younger informants in Dutch. Second, there was quite a different distribution of correct scores over sentence types in the two languages. In Moroccan Arabic, the scores were highest for *ss* and *os* sentences and lowest for *so* and *oo* sentences. However, the differences were not as dramatic as in Dutch, where the children did not even manage to guess some of the *so* and *os* sentences right, with scores close to 0, and, in contrast, rather high scores on *ss* sentences from age 4 on, with *oo* sentences around chance level.

For the older informants the following can be concluded. The factor Time turned out to be significant ($F(2,48)=12.85$, $p<.001$). The informants performed better over time, as was expected. The factor Type ($F(3,72)=11.71$, $p<.001$) was also a significant one, in that performance on *ss* and *os* sentences was much better than performance on *so* and *oo* sentences. There was also an interaction between

Time and Type (F(6,144)=3.43, p=.003), which tells us that there was no progress for *ss* sentences over time and that there was progress for the other three sentence types. The fact that there was no progress in the comprehension of *ss* sentences suggests that performance on these sentences may be based on a specific strategy. We will come back to this in the last part of Section 4.4.1.3.

If we make a comparison between the performances in L1 and L2, we see that, as in the case of the younger informants, there was also an interaction between Language and Type (F(3,72)=19.33, p<.001) for the older informants. This indicates that for the two languages quite a different distribution of correct scores over sentence types was found. There was also a significant interaction between the factors Time, Language and Type (F(6,144)=3.01, p=.008. From this we conclude that there was a difference between the performances on the different sentence types in Moroccan Arabic on the one hand and in Dutch on the other. In Moroccan Arabic, there was hardly any progress on *ss* and *os* sentences but there was progress on *so* and *oo* sentences. For Dutch, there was no progress on *ss* sentences, but there was progress on the other three sentence types. Moreover, there was a more even distribution of performances on the different sentence types in Moroccan Arabic than there was in Dutch. For Dutch there was a clear pattern that performances on *ss* and *os* sentences were far better than performances on the other two sentence types (*ss and os are easier to process than so and oo*).

4.4.1.2 Dutch control group

Monolingual children

In Table 4.3, the correct scores of the control group of Dutch monolingual children are shown. If we look at this table, we see at a glance that here, too, the distribution of correct scores over the various sentence types was rather diverse; rather high scores emerged on *ss* sentences up until 60% at age 7, after which there was a decrease to a meagre 37% at age 10. For *so* sentences we witnessed very low scores at all ages. The performance on *os* sentences seemed to be the only one developing according to a "normal" learning pattern, by progressing from 15% correct at age 4 to 85% correct at age 10. Performance on *oo* sentences stayed the same throughout the whole period.

Table 4.3 Mean correct scores (%) of the Dutch control group (N=25)

Age	*SS*	*SO*	*OS*	*OO*
4	36	3	15	22
5	64	1	25	12
6	51	0	34	21
7	60	0	43	14
8	51	5	61	20
9	54	7	76	21
10	37	10	85	18

In the performance of the younger informants, the factor Time ($F(3,72)=15.48$, $p<.001$) was significant, most probably because of the progress made on *ss* and *os* sentences, since there was no progress at all for the other two sentence types over time. Another statistically significant factor was Type ($F(3,72)=19.43$, $p<.001$). This factor is a very obvious one, because we could easily see that the order of success for the different sentence types was: *ss* > *os* > *oo* > *so*. The significant interaction between Time and Type ($F(9,216)=4.19$, $p<.001$) shows that the development of the performances over time on the different sentence types was not the same. There was progress over time for *ss* and *os* sentences, as opposed to a stagnation right in the beginning of the performances on *so* and *oo* sentences.

For the older informants, the factor Type ($F(3,72)=32.28$, $p<.001$) was significant, indicating about the same differences between sentence types as for the younger informants: high performances on *ss* and *os* sentences and low ones on *so* and *oo* sentences. But the order of "difficulty" was slightly different from the one we observed in the younger informants: *os* > *ss* > *oo* > *so*. The statistically significant interaction between Time and Type ($F(6,144)=2.84$, $p=.012$) indicates that the development of performances over time was different for the four sentence types: performance on *os* sentences clearly made progress, whereas there was a decrease over time of performance on *ss* sentences and a stagnation for *so* and *oo* sentences.

Comparison between monolingual and bilingual children

In comparing the performances in Dutch of the Moroccan bilingual children and the Dutch monolingual children, we found for the younger children that the factor Ethnicity ($F(1,48)=7.04$, $p=.011$) was significant. This tells us that there was a difference between the two groups and that, on the whole, the Dutch control group performed better than the Moroccan bilingual group. It is not interesting to look at other factors, such as Time or Type. First of all, we have already looked at these factors for the two groups separately and second, the group as a whole is not homogeneous. Conclusions on their performances must always be seen in the light of differences between the groups and not within the whole group taken as one. Therefore we only looked at the factor Ethnicity and any interactions between this factor and the other factors.

There were significant interactions between Ethnicity and Time ($F(3,144)=6.20$, $p=.001$) as well as between Ethnicity and Type ($F(3,144)=3.52$, $p=.017$). The first interaction indicates that the two ethnic groups developed differently over time. This interaction can be explained from the fact that the Moroccan children hardly seemed to make any progress (this was already evident from the fact that the factor Time was not significant for this group for Dutch), while the Dutch children did (factor Time was significant). The second interaction, the one between Ethnicity and Type, shows us that there were differences between the performances on the different sentence types by the Moroccan informants on the one hand and the Dutch informants on the other. On the whole, both groups

performed best on *ss* sentences and worst on *so* sentences. For the Moroccans the order of difficulty for the remaining two sentence types was *oo* > *os* and for the Dutch it was exactly the other way around: *os* > *oo*.

For the older informants, the factor Ethnicity was not significant, indicating that, on the whole, the children from both ethnic groups performed at about the same level. There were, however, the same two interactions to be found as for the younger informants; the interaction between Ethnicity and Time ($F(2,96)= 4.55$, $p=.013$) and the interaction between Ethnicity and Type ($F(3,144)=2.84$, $P=.040$). The first interaction tells us the opposite of what this same interaction told us for the younger informants. Here it indicates that the Moroccan children made progress over time and the Dutch children did not, or, at least showed a less clear picture of progress than the Moroccan children did. The second interaction (between Ethnicity and Type) indicates, as it did for the younger informants, that there were differences between the performances on the different sentence types by the Moroccan informants on the one hand and the Dutch informants on the other. On the whole, both groups performed worst on *so* sentences, followed by *oo* sentences. But the highest scores for the Moroccan informants were on *ss* sentences first and then on *os* sentences, whereas for the Dutch informants it was just the other way around. Thus, the order of difficulty for the Moroccans was *ss* > *os*, and for the Dutch: *os* > *ss*.

4.4.1.3 Moroccan control group

Monolingual children

As mentioned before, there were 3 age groups for the monolingual control group of Moroccan children living in Morocco. The scores for the control group are shown in Table 4.4. We have split up the results for the four different sentence types as well as for the two different orders. We see that there are not one or two categories (sentence type or order) that immediately draws the attention because performance on them was particularly high or low. There was quite an even distribution between the different types and orders, although in the end (9-year-olds) we see that for the *svo* order the *ss* and *so* sentences were easiest and for *ovs* order it was precisely the other two sentence types, i.e., *os* and *oo*, that had the highest scores. These were all sentences with the relativised clause at the beginning of the sentence, or what was called the interruption of processing units in Slobin's Embeddedness Hypothesis. For each category, there was some kind of progress over the 3 age groups, with the exception of the *oo* sentences in *svo* order, where the scores stagnated right from the beginning.

Table 4.4 Mean correct scores (%) of the Moroccan control group (N=25)

	SVO order				*OVS order*			
Age	*SS*	*SO*	*OS*	*OO*	*SS*	*SO*	*OS*	*OO*
5	33	16	27	49	18	31	53	42
7	52	22	35	42	15	36	74	34
9	60	52	40	43	32	43	75	60

If we look at the various factors that might have played a significant role in these results, we find that the factors Grade ($F(2,72)=9.24$, $p<.001$) and Type ($F(3,216)= 16.27$, $p<.001$) were such factors. The first one can be compared to the factor that was called Time in the previous sections. We could not call it real time here, however, because there is no time factor involved in a cross-sectional data set. There were, of course, differences between the different age groups and we therefore called this factor Grade. The significance of this factor shows that the older children performed better than the younger ones. So the 7-year-olds performed better than the 5-year-olds and the 9-year-olds performed better than the 7-year-olds. The significance of the factor Type indicates that, although the distribution of correct scores over the different sentence types seemed more even than for the Moroccan bilingual group and the Dutch control group, there were statistically significant differences between the scores on the different sentence types. The order of difficulty for the Moroccan control group can be rendered as follows: *os* > *oo* > *{ss, so}*.

Significant interactions were established between Grade and Type ($F(6,216)=2.50$, $p=.024$) and between Order and Type ($F(3,216)=33.12$, $p<.001$). The first interaction indicates the difference in progress over the three grades concerning the four different sentence types; the children performed better as they got older on *ss*, *so*, and *os* sentences. However, for the performances on *oo* sentences, we see that the 7-year-olds performed under the level of the 5-year-olds, and the 9-year-olds were only partly better than the 7-year-olds (only in the case of *ovs* order). The second interaction, the one between Order and Type, shows that for *svo* order the easiest sentence type to process was *ss*, which was the most difficult one for the informants in *ovs* order. For *ovs* order, the easiest sentence type turned out to be *os*, which was a difficult one in *svo* order; *so* and *oo* sentence types took an intermediate position.

There was also three-way interaction between Grade, Order and Type ($F(6,216)=3.30$, $p=.004$), indicating that the distribution described above of sentence types that were either easy or difficult to process, in relation to word order, was not the same for the three age groups. For *ovs* order, we can state that the order of difficulty over the age groups was the same and looked like this: *os* > *oo* > *so* > *ss*. For *svo* order, we cannot give such an order of difficulty. For the 5-year-olds, the order was *oo* > *ss* > *os* > *so*, for the 7-year-olds it was *ss* > *oo* > *os* > *so* and for the 9-year-olds it was *ss* > *so* > *oo* > *os*. For the 5- and 7-year-olds the scores were quite comparable in that *ss* and *oo* were performed best

and *so* and *os* worst. But the 9-year-olds showed a more even distribution over sentence types and a completely different distribution pattern.

Comparison between monolingual and bilingual children

If we compare the results of the bilinguals and the monolinguals for Moroccan Arabic, and take into account the factor Country and all factors that showed interactions with this factor, we get the following picture for the 5-year-olds (we compare the 5-year-old bilinguals to the 5-year-old monolinguals, etc.). The factor Country turned out to be significant ($F(1,48)=48.54$), $p<.001$). The monolingual informants in Morocco clearly performed better on this test than the bilingual informants in the Netherlands. On the whole, the former had much more sentences right, although there were differences between sentence types and word order, which we can see in the significant interactions between Country and Type ($F(3,144)=9.05$, $p<.001$) and between Country and Order ($F(1,48)= 13.71$, $p=.001$). The first interaction indicates that the distribution of scores on the four different sentence types was not the same in the two groups; the sentence types with the highest scores for the monolingual group were *os* and *oo*. For the bilingual group, there was only one sentence type that they performed well on and that was *ss*. On this sentence type they even performed better than the monolinguals. The extremely low scores of the bilingual group on *so* sentences had no parallel in the monolingual group either. The second interaction indicates that the distribution of scores on the two different word orders was not the same in the two groups; the children in the Netherlands performed best on *svo* sentences and the children in Morocco on *ovs* sentences.

For the 7-year-olds the factor Country ($F(1,48)=12.08$, $p=.001$) was also significant, and again because on the whole the 7-year-old informants in Morocco performed better than the 7-year-old informants in the Netherlands. There were, again, also interactions between Country and Type ($F(3,144)=7.69$, $p<.001$) and Country and Order ($F(1,48)=4.05$, $p=.050$). The first interaction is also quite similar to this same interaction for the 5-year-olds. The children in the Netherlands performed best on *ss* sentences, even better than the children in Morocco, but they had extremely low scores on *so* sentences. The monolingual children had a much more even distribution of correct scores over the different sentence types, but like the 5-year-olds, with the highest scores on *os* and *oo* sentences. The second interaction again indicates that the distribution of scores on the two different word orders was not the same in the two groups; the children in the Netherlands performed best on *svo* sentences and the children in Morocco on *ovs* sentences.

For the 9-year-olds, the picture is slightly different. Although the factor Country ($F(1,48)=11.61$, $p=.001$) turned out to be significant, in that again the children in Morocco performed better than the children in the Netherlands, there was no significant interaction between the factors Country and Type. There was, however, an interaction between the factors Country and Order ($F(1,48)=18.41$, $p<.001$), and statistically significant three-way interaction between Country, Order

and Type (F(3,144)=3.22), p=.025). The interaction between country and order indicates that also for this group the children in the Netherlands performed best on *svo* sentences and the children in Morocco on *ovs* sentences. The three-way interaction showed the different distribution of correct scores over the four sentence types and the two word orders for the two groups (bilinguals and monolinguals). For *ovs* order, the distribution of correct scores over the different sentence types was highly comparable for the two groups; although the monolinguals scored much higher than the bilinguals, it is obvious that for both groups the *ss* and *so* sentences were much more difficult to process than the *os* and *oo* sentences. For *svo* word order, quite a different picture emerged from this comparison: for the bilinguals the order of difficulty was *os* > *ss* > *oo* > *so* and for the monolinguals this was *ss* > *so* > *oo* > *os*.

In conclusion, the fact that performances on *svo-ss* and *ovs-os* sentences had the highest correct scores may tell us something about the principle of *focus* in the sentences. By focus in this context we mean the linear appearance of the reference to the names of the animals and the actions undertaken by them in the test sentences. If we assume that the sentences in which the first animal mentioned is the focus of the sentence (i.e., undertakes the first action mentioned and either undertakes or undergoes the second as well) will be the ones with the highest scores, then this leads us exactly to *ss* sentences in *svo* word order and *os* sentences in *ovs* word order. However, we must then wonder whether the informants actually comprehend the sentences or process all sentences according to this principle of focus. We would like to suggest a way to gain more insight into this matter in the following sections.

4.4.2 Patterns of error types

If the informants do not perform the actions of the test sentences correctly, they can make an error in the performance of the main clause, or in the performance of the relativised clause, or in the performance of both. Because of the fact that we documented what actions the children performed, also when they made errors, we can have a closer look at these different kinds of errors. We will look into each kind of error separately. Because the errors are interdependent on each other, we will not take error type as a separate factor. For instance, if a group of informants has very high scores on "error in main clause," say over 50%, it can never have high scores on the other two error types, nor on the correct scores, because there is less than 50% left for these three categories.

4.4.2.1 Bilingual group in the Netherlands

Table 4.5 shows the errors made by the bilingual informants in their performance of *svo* ordered sentences in their L1, Moroccan Arabic. *M* stands for error in the main clause, *R* for error in the relativised clause and *B* for error in both clauses.

For instance, the percentage of errors made by the 4-year-olds on *ss* sentences is 43% in the main clause + 8% in the relativised clause + 13% in both clauses = 64% in total. This is the total percentage of errors made by this group on this sentence type, whereas the correct score on this sentence type in *svo* order for 4-year-old bilinguals is 36% (cf. Table 4.1). Table 4.6 gives the same results on errors for sentences with *ovs* order.

Moroccan Arabic

If we look at Table 4.5, we see that for *ss* sentences most errors were made in the main clause, for *so* sentences in all three possible positions, and for *os* and *oo* sentences mostly in the relative clause. For *ss*, *os* and *oo* sentences this means that the second part of the sentence was not acted out correctly, in contrast to the first part. In the first part of these sentences (see Section 4.3.2 of this chapter), only simple verb forms were used, i.e., no forms with the coindexed pronoun suffixed to the verb. The only sentence type in which coindexing takes place in the first part of the sentence, is *so*, exactly the sentence type where the informants made about an equal number of errors in all places in the sentence, whether it was main clause, relativised clause or both.

Table 4.5 Mean errors (%) of the bilingual group in Moroccan Arabic (SVO word order) (N=25)

	SS			*SO*			*OS*			*OO*		
Age	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*
4	43	8	13	29	29	36	10	62	13	9	53	14
5	41	1	1	21	47	31	5	85	4	3	70	4
6	30	1	6	26	43	17	3	83	2	1	73	3
7	32	0	1	17	43	32	4	81	2	2	72	2
8	35	3	1	31	19	23	1	53	0	0	72	0
9	49	4	0	17	25	29	2	47	0	0	56	1
10	42	8	0	17	21	15	4	40	0	3	47	0

In Table 4.6, we see first of all that many more errors were made in *ovs* sentences. We knew already that this would come out, from Table 4.1, which showed us that the correct scores for *svo* sentences were much higher on the whole than those for *ovs* sentences, so that the percentages of errors must be higher for the latter than for the former. In the second place we see a mirrored picture, if we compare Tables 4.5 and 4.6.

Table 4.6 Mean errors (%) of the bilingual group in Moroccan Arabic (OVS word order) (N=25)

	SS			*SO*			*OS*			*OO*		
Age	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*
4	12	25	58	17	25	52	40	8	25	17	15	60
5	8	8	79	17	18	63	63	3	6	7	24	63
6	9	15	71	16	16	52	35	6	2	19	25	44
7	3	15	73	16	11	58	50	2	2	11	28	52
8	23	26	37	14	35	41	54	0	1	39	13	32
9	24	27	32	10	30	48	63	1	0	17	8	44
10	21	38	19	11	45	25	48	4	2	32	8	26

Apart from the many errors that were made in both the main clause and the relativised clause by the younger children, Table 4.6 shows that for *ss* and *so* sentences most errors were made in the relativised clause and for *os* and *oo* sentences in the main clause. Here we see again that the informants made most of the errors in interpreting the second half of the sentence. This confirms our idea about focus. The informants focus on the first action in the sentence, then the sentence becomes too complicated to process and they usually finish the action by guessing or using whatever animal they have in their hands at that moment, to perform the second action, towards either of the remaining animals.

Dutch

From the results of the same bilingual group in their L2 (Dutch) presented in Table 4.7, we see that a similar picture emerges: errors were made in the last part of the sentence, irrespective of whether this part of the sentence was the main clause or the relativised clause.

Table 4.7 Mean errors (%) of the bilingual group in Dutch (N=25)

	SS			*SO*			*OS*			*OO*		
Age	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*
4	36	2	17	16	46	38	5	83	5	2	70	8
5	33	1	2	3	63	34	0	88	0	0	83	0
6	45	0	0	2	53	46	0	93	0	0	86	0
7	41	0	0	2	57	42	0	98	0	0	83	0
8	38	1	0	2	60	36	0	59	0	1	85	0
9	44	0	0	2	45	41	0	46	0	0	82	0
10	42	3	0	3	38	33	0	32	0	0	78	0

This resulted in errors in the main clause for *ss* sentences and errors in the relativised clause for *os* and *oo* sentences. We would then expect also to find many errors in the main clause for *so* sentences, but here another factor played

a role. In the construction of Dutch *so* and *oo* sentences we made use of agreement (see Section 4.3.2), causing rather unnatural, though grammatically correct, relativised clauses. For *oo* sentences this resulted in a very difficult last part of the sentence. Therefore, up till the age of 10 there was a very high percentage of errors in the relativised clause (with two causes: coming at the end of the sentence and consisting of difficult grammar). For *so* sentences, this meant that the beginning of the sentence was very difficult because that was where this relativised clause (with number agreement) was placed, and the end was difficult just because it is the second part of a difficult task. This resulted in many errors in both the main clause and the relativised clause. The high percentages on *B* (errors in both the main clause and the relativised clause) were remarkable, if one bears in mind that for the other sentence types there were hardly any errors on *B* after age 4.

4.4.2.2 Dutch control group

The results of the Dutch monolingual control group are a copy of the results in Dutch of the bilingual core group. Most errors were found in the relativised clause for *os* and *oo* sentences, in the main clause for *ss* sentences and in both the main clause and the relativised clause for *so* sentences. We also see that there was hardly any progress over time, except for *os* sentences. The error scores remained rather similar throughout the experiment.

Table 4.8 Mean errors (%) of the Dutch control group (N=25)

	SS			*SO*			*OS*			*OO*		
Age	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*
4	35	17	13	7	50	41	4	76	6	4	64	11
5	26	6	5	6	67	26	0	74	1	1	87	0
6	44	4	2	5	53	42	0	66	0	0	79	0
7	40	0	0	2	58	41	0	57	0	0	86	0
8	47	3	0	4	48	44	0	39	0	2	78	0
9	44	1	1	0	46	47	0	35	0	2	78	0
10	63	0	0	0	32	59	0	15	0	0	83	0

4.4.2.3 Moroccan control group

In Table 4.9, the results of the Moroccan monolingual control group are shown. If we compare Tables 4.9 and 4.5, we get a much clearer picture from the monolinguals than from the bilinguals: most of the errors in *ss* and *so* sentences were in the main clause and most of the errors in *os* and *oo* sentences were in the relativised clause. There were quite some errors in both the main and the relativised clauses for *so* sentences. This was probably due to the fact that the

relativised clause, although at the beginning of a sentence, was rather difficult because of the prestated topic and, consequently, the coindexed suffix on the verb.

Table 4.9 Mean errors (%) of the Moroccan control group (SVO order) (N=25)

	SS			*SO*			*OS*			*OO*		
Age	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*
5	63	3	1	56	5	23	0	72	1	1	50	0
7	48	0	0	53	7	18	0	65	0	0	57	1
9	40	0	0	42	4	2	0	60	0	0	57	0

Table 4.10, finally, gives the results of the same group, for *ovs* ordered sentences. Here, the conclusion is about the same as for the results shown in Table 4.9. Most of the errors were made at the end of the sentences, irrespective whether this part of the sentence was main clause or relativised clause.

Table 4.10 Mean errors (%) of the Moroccan control group (OVS order) (N=25)

	SS			*SO*			*OS*			*OO*		
Age	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*	*M*	*R*	*B*
5	3	58	21	17	43	9	45	0	2	30	17	11
7	3	59	23	8	40	16	24	2	0	35	20	11
9	2	63	3	3	51	3	25	0	0	36	2	2

We saw errors in the relativised clause for *ss* and *so* sentences and errors in the main clause for *os* and *oo* sentences. For *ss* and *so* sentences, we also saw some errors in both clauses, indicating that also the main clause (although at the beginning of the sentence) was misunderstood by some of the informants. That again may be caused by the fact that the main clause for *ss* and *so* sentences had a prestated topic and the coindexed pronominal reference in the form of a suffix, attached to the verb.

4.4.3 Relative clauses in narratives

We made a side-trip and turned to the productive use of relative clauses in our data set of spontaneous narratives (retellings of frog stories, cf. Chapters 5 and 6). We did this in order to see if the production of relative clauses over time in the different languages and by the different groups can tell us something about the findings regarding their comprehension of complex relative clauses. We also wanted to see if the informants applied their comprehension of relative clauses in the production of (semi-)spontaneous speech.

Moroccan Arabic

In Table 4.11 we see that there were not many occurrences of relative clauses in the Moroccan Arabic retellings of the children. For the 4-year-olds, for example, there were seven relative clauses in 25 frog stories (with an average of approximately 24 utterances per story). We also see that there was hardly any change over time. Six times in 25 frog stories was about the average for the bilingual children, no matter which age group. The average for the monolingual children living in Morocco was considerably higher; i.e., more than twice as many as for the bilinguals.

Table 4.11 Occurrences of relative clauses in Moroccan Arabic frog story retellings (N=25)

Age	*Bilingual children*	*Monolingual children*
4	7	
5	5	15
6	5	
7	7	18
8	3	
9	7	10
10	9	

Among the relative clauses found in the spontaneous speech data, there were no restrictive relative clauses comparable to those constructed in our task. We could, however, categorize one example as *ss* (sentence (5)) and one as *os* (sentence (4)). In the other examples the functions of the headnoun are *subject* in the main clause and *prepositional phrase* in the relativised clause (sentences (6) and (7)), or both *prepositional phrase* (sentence (8)) or *temporal clause* (sentence (3)) or with only one function that can be attributed to the headnoun, in this case *subject* (sentences (1) and (2)):

(1) *hadik meɛza lli eh eh ṭeyyḥat-hum.*
that goat that er er had made them fall.
(Bilal, bilingual Moroccan boy, 4 years old, in Moroccan Arabic)

(2) *u hadik farxi lli ṭeyyḥat-u.*
and that (young) bird that had made him fall.
(Nahid, bilingual Moroccan girl, 6 years old, in Moroccan Arabic)

(3) *u saɛtek lli qam men n-nɛas žber-ha mšat.*
and at the time that he got up from sleep, he found her gone.
(Ouail, bilingual Moroccan boy, 8 years old, in Moroccan Arabic)

(4) *ϵend-u waḥed l-kelb lli smiyt-u Bubi.*
he has a dog whose name is Bobby.
(Fairouz, bilingual Moroccan girl, 10 years old, in Moroccan Arabic)

(5) *baš yšuf waš kayna hna dik l-meϵza lli tqebṭ-u.*
in order to see if here was that goat that took him.
(Rajae, monolingual Moroccan girl, 5 years old, in Moroccan Arabic)

(6) *hna ha hiya š-šežra lli kan wâqef fe-ha.*
here is the tree that he was standing on.
(Hanna, monolingual Moroccan girl, 7 years old, in Moroccan Arabic)

(7) *hadi l-ġzala lli kan râkeb fe-ha had l-weld.*
this deer that that boy was riding on.
(Hanna, monolingual Moroccan girl, 7 years old, in Moroccan Arabic)

(8) *u mnin faqu ṭellu ϵla l-bwaṭa lli kanet fe-ha ž-žrana.*
and when they woke up, they looked at the box in which the frog had been.
(Youssef, monolingual Moroccan boy, 9 years old, in Moroccan Arabic)

We see that there were no occurrences of *âš* (inanimate) or *men* (animate), the other two relative pronouns in Moroccan Arabic (cf. Ennaji 1982). They were found neither in an isolated position, nor in combination with prepositions, which is very common usage among adult speakers of Moroccan Arabic. We also see from these examples that even 4-year-olds made grammatically correct relative clauses, and also that no increase in complexity of the clauses could be witnessed over time. There were differences, however, over time when we make a comparison between the monolingual and the bilingual children, in that the former produced sentences with a more complex syntax than the latter.

Dutch

Table 4.12 shows that the bilingual children produced less relative clauses in Dutch than they did in Moroccan Arabic. The monolingual Dutch children produced about twice as many relative clauses. So in both Moroccan Arabic and Dutch, the monolingual children produced twice as many relative clauses as the bilingual children.

Table 4.12 Occurrences of relative clauses in Dutch frog story retellings (N=25)

Age	*Bilingual children*	*Monolingual children*
4	1	1
5	0	3
6	3	10
7	4	9
8	3	13
9	15	6
10	10	15

The difference between the Moroccan Arabic and Dutch data is that there was a clear development over time for Dutch, which was not found for Moroccan Arabic. The productivity of relative clauses in Moroccan Arabic seemed to be already present at a very young age. For Dutch we see that real productivity started at age 6 for the monolinguals and at age 9 for the bilinguals. Some examples in Dutch are presented here:

(9) *nou gaat hij zo iemand halen die weet niet hoe heet.*[1]
now he goes to get somebody that do not know what called.
(Bilal, bilingual Moroccan boy, 4 years old, in Dutch)

(10) *die jongen zit in een gat te roepen waar die kikker is.*
that boy sits to call in a hole where that frog is.
(Mustafa, bilingual Moroccan boy, 7 years old, in Dutch)

(11) *maar &j de hond had // de pot waar de kikker in zat heeft ie om z'n kop.*
but &b the dog had // the bowl where the frog was sitting in he has round his head.
(Khalid, bilingual Moroccan boy, 8 years old, in Dutch)

(12) *er was eens een jongen die een kikker had.*
there once was a boy that had a frog.
(Mariam, bilingual Moroccan girl, 9 years old, in Dutch)

(13) *er was eens een jongetje die een hondje had en een kikker.*
there once was a boy that had a dog and a frog.
(Yasmina, bilingual Moroccan girl, 10 years old, in Dutch)

(14) *en daar die hond kijkt in de glaasje waar de kikker in zit.*
and there that dog looks in the little glass in which the frog is sitting.
(Tom, monolingual Dutch boy, 6 years old, in Dutch)

[1] Bilal does not know the word for 'mole' and tries to explain it in this way.

(15) *de hond kijkt eh in een pot waar een kikker zit.*
the dog looks eh in a bowl where there sits a frog.
(Timmy, monolingual Dutch boy, 7 years old, in Dutch)

(16) *de hond kijkt naar de kikker die het jongetje gevangen heeft.*
the dog looks at the frog that the boy has caught.
(Jony, monolingual Dutch girl, 8 years old, in Dutch)

(17) *hee het was de kikker die Jan gevangen had.*
hey it was the frog that Jan had caught.
(Tom, monolingual Dutch boy, 10 years old, in Dutch)

Here we also see some sentences that can be classified according to one or more of our combinations of functions of the headnoun. Sentences (12) and (13) are *ss*, sentence (17) is *so*, and sentence (9) may be seen as an *oo* sentence, although it is not completely clear what the informant means. Also here we see combinations of *prepositional clause* in the main clause and *subject* in the relativised clause (sentence (16)), or with both functions as *prepositional clauses* (sentences (10), (11), (14), and (15)).

We did not see much difference over time in the kinds of relative clauses that the children produced. They did not become more complex as the children grew older. Usually, the most obvious differences in complexity were between the youngest and the older children. And it was precisely the 4- and 5-year-olds that hardly produced any relative clauses. In this way, it is difficult to observe any kind of development.

4.5 CONCLUSIONS AND DISCUSSION

In this final section, we will look at the differences and similarities in the results of the informants, regarding the factors Sentence Type and Word Order. We looked at certain developmental features that played a role in the children's performances. There must be a certain progress over time as the children's receptive (and productive) skills in both languages improved. We also looked at the universal cognitive strategies the children may have used to perform this experimental task, that is, strategies that all children, whether they are bilingual or monolingual, L1- or L2-learners, adhered to in order to fulfill the task. There might also be a (positive or negative) effect caused by the children's bilingualism. We compared the results of the bilinguals to those of the monolinguals to find out if transfer might account for any peculiarities we encountered. We also took a comparative look at the relative clauses produced by the children in the *frog story* retellings in order to find out if there was any connection between comprehension and production of relative clauses for our informants.

Sentence type

For Dutch we see that the obligatory use of agreement as the only way to construct *so* and *oo* sentences must have influenced the results. The way agreement was applied in these sentences is grammatically correct but not commonly used in spontaneous speech. The fact that the Moroccan bilingual children performed low on Dutch *so* and *oo* sentences must therefore be considered not as a consequence of their bilingualism, but of the fact that these sentences were very difficult to process anyway. With respect to the monolingual Dutch children, we saw the same pattern. At the ages of 9 and 10, some of the children seemed to comprehend some of the *so* sentences, which cannot be said for the *oo* sentences, where performance stayed around chance level. The correct scores on *ss* sentences were rather high for all ages, but without any visible progress. Performances on *os* sentences were the only ones that seemed to follow a predictable developmental pattern: low scores for the youngest children and rather high scores for the oldest children.

There is more to the interpretation of these results than the mere observation that, with time, the children will learn to comprehend all sentence types, but at a later age than 10. The skewed distribution of correct scores (high scores on *ss* for all ages, even age 4, hardly any progress on *so* and *oo* sentences, and a regular distribution of comprehension over time for *os*) led us to the idea that there is more to the processing of these sentences than meets the eye.

The fact that the correct scores for *ss* sentences were higher for the younger children than for the older ones, created the need to take a closer look at this issue. We took a smaller sample of informants (5 informants aged 4 and 5 informants aged 8, and their results one year later) to scrutinize the way they handled those test sentences they were not able to act out correctly. We tried to discover the children's interpretations of these sentences by means of an error analysis on the experimental results.

If we look at the performances of this sample of informants and at what action they performed in cases where they did not act out the right movements with the toy animals, we get the results presented in Table 4.13. For example, of all the sentences they misinterpreted, the 4-year-old informants in Moroccan Arabic acted out 69% of the cases as *ss* sentences. And of all the errors made by the 9-year-olds in Dutch, they turned 25% into *os* sentences. It is obvious that the strategy used especially by the younger children is to interpret most of the sentences they hear as *ss* sentences. They processed the test sentences in a linear way instead of being able to understand and reproduce the functions the words have. At a later age, the *os* sentences also fulfilled this role of basic structure of a sentence.

Table 4.13 Interpretations of erroneously performed sentences (%) of bilingual core group (N=5)

	Moroccan Arabic				*Dutch*			
Age	*SS*	*SO*	*OS*	*OO*	*SS*	*SO*	*OS*	*OO*
4	69	11	11	9	70	9	7	14
5	74	7	15	4	82	1	9	8
9	66	6	25	3	72	1	25	2
10	40	19	22	19	58	0	41	1

Obviously, one can never know what a child is thinking at the moment (s)he performs an action that (s)he does not (fully) understand. But, because of the accurate test administration that was used, and the observations the interviewers made, we claim that most children used a strategy to survive this rather difficult test. And once they had developed a strategy, they used it for many years, until they slowly reached the age of discretion and started to interpret some of the sentences correctly. If the 4-year-olds score 100% correct on the *ss* sentences and 0% on the other three sentence types, then we can not state that for this group *ss* sentences are the easiest to process. The children have not processed anything, but they have only found a way to act out this task in a way satisfactory to the interviewer. This strategy is one of acting out actions in the order in which they are mentioned, regardless of grammatical cues such as number agreement (Dutch) or coindexed pronouns (Moroccan Arabic), usually resulting in the production of *ss* or *os* sentences.

We conclude that the problem for the informants in interpreting these sentences is not the function of the headnoun in both main and relativised clause, nor the fact that these functions are parallel or not for both clauses, nor the difference between subject focus and object focus (factor 1, Section 4.1), nor the interruption of processing units (factor 3, same section), but the surface structure of the sentences (factor 2, idem) and the use of grammatically difficult markers (factor 4, idem). We see that informants tended to act out the first part of the sentence correctly and then lost sight of the right interpretation, except for sentences that began with difficult grammatical clues. In these cases they lost sight of the correct solution right from the beginning, resulting in double errors (errors in both main clause and relativised clause). In these sentences there is no "perspective maintenance" as MacWhinney & Pléh (1988) call it.

Word order

Word order variation was only used in the Moroccan Arabic task for reasons explained in the beginning of this chapter. From the outcomes of this task, we see that word order was an interesting factor. The bilingual children in the Netherlands performed significantly better on *svo* than *ovs* order sentences, whereas for the monolingual children in Morocco the opposite was true. This indicates that the monolingual children were much better at processing grammatical cues, however difficult, and interpreting them correctly. The bilingual

children were much more at ease with basic sentence structures up until age 10, and this holds for Moroccan Arabic as well as for Dutch. However, at age 9 and 10, they performed better than the Dutch monolinguals on *so* and *oo* sentences. Surprising as this may seem, this might be an indication that the bilingual children were more aware of the existence and use of grammatical cues in Dutch, whereas the Dutch children were not, because the *ovs* order used in the relativised clause in Dutch is rarely used in everyday speech. In the discussion of the results of a very similar task on relative clauses, performed by Turkish informants, Aarssen also stated that "differences are found in Turkish as soon as word order is varied" (1996:86).

Relative clauses in spontaneous speech

On the basis of the relative clauses that were produced by the informants in their narratives, we cannot draw firm conclusions regarding their ability to construct them. First of all, it is not necessarily the case that a child that did not produce a relative clause in a story is also unable to construct one. This always remains the question when one looks at (semi-) spontaneous speech in search of a particular phenomenon. Secondly, the number of relative clauses found is so small that one can hardly draw any conclusions on that basis. And finally, the relative clauses found were not similar in structure to those used in our experiment. No restrictive relative clauses with an *ss, so, os* or *oo* pattern were found.

We do see, however, that for Moroccan Arabic, there was no progress whatsoever in the production by bilinguals and monolinguals. The monolinguals produced about two to three times more relative clauses, but they did not show any progress over age either. For Dutch the same can be said for the monolinguals, but the bilingual informants showed clear progress after the age of 8.

On the basis of a comparison between the results of the experiments and the production in the narratives, we can say that at the age at which the children had developed a reasonable ability to understand rather difficult relative clauses (8 years old), they also started showing an increase in the production of relative clauses.

5 TOPIC CONTINUITY

5.1 INTRODUCTION

In this chapter, the focus is on the notion of 'topic continuity' in children's retellings of a picture story, called the *frog story* (Mayer, 1969), in Moroccan Arabic and Dutch. Monolinguals (Moroccan children and Dutch children) and bilinguals (Moroccan children) of different age groups (4, 5, 6, 7, 8, 9 and 10) were compared. Their ways of referring (nominal vs. pronominal) to the two main characters in the story (a boy and a dog) were taken into account.

The development of cohesion in narratives has become an important object of language acquisition research in the last 20 years. Studies on advanced language development in children have been concerned with discourse, rather than with isolated sentences (e.g., Karmiloff-Smith 1979, 1985). Cohesive means are those linguistic devices that are used by a speaker to express the connection (e.g., temporal or causal) between single propositions. Referring expressions in discourse are another form of cohesion.

When a speaker refers to characters in a narrative discourse, he has a set of devices at his disposal for such reference, such as definite or indefinite nominal forms, personal or demonstrative pronouns, and zero anaphors. In narratives, a character is generally introduced by a nominal, mostly an indefinite NP. In the case of a character switch, use will be made of a definite NP to re-establish the identity and in the case of maintenance of the reference, the least marked form, a pronoun or zero reference, will be used. However, in a situation in which an informant (re)tells a story (e.g., a film or a cartoon) in the presence of a researcher, and in which there is shared knowledge between informant and researcher, this might, because of the here-and-now context, elicit more deictic expressions (e.g., use of demonstrative pronouns, accompanied by gestures, such as pointing).

McGann and Schwartz (1988) found that references to the main character in stories differed from the forms used to refer to minor characters, in that more implicit linguistic forms (i.e., pronominals) were used more extensively for reference to the main character. They gave the following characteristics of a *main character*, based on a literature survey (McGann & Schwartz, 1988:216):

1. It is usually more agentive or is more intimately involved in causing the events that constitute the story's actions;
2. It is higher in animacy than any competing character;
3. It usually has a primary function in the story in terms of reaching a goal;
4. It almost always gets named if any characters do;
5. It is referred to more frequently than any other character;
6. It occurs in more than one scene and across more than one setting, that is, it is not dependent upon a single setting;
7. It is usually introduced in the initial stage (or 'setting') of a narrative.

Bamberg (1987) found that with children speaking German as their mother tongue, aged 3 to 10, the younger children tended to refer to the main character by means of a pronoun in either case, i.e., whether the referent was maintained in the narrative or in the case of a switch to this referent. The older children followed a more adult-like strategy, in which they used nominal expressions to refer to the main character in the case of a switch to a referent and pronouns when reference was maintained. Cross-linguistic evidence for this pattern was found for instance by Hickmann (1991) for English, Chinese and French, and by Verhoeven (1988) for Turkish.

5.2 RESEARCH QUESTIONS

In the case of the often used *frog story* (see Appendix IV for a description of the story), it is generally accepted that the boy is the main character. All characteristics mentioned by McGann & Schwartz (1988) apply to him. The dog is the secondary character because it is more prominent than all the other animals that appear in the story, but not as prominent as the boy.

The present study dealt with the following research questions (where 'a referent' stands for the boy on the one hand and the dog on the other):

- What nominal and pronominal expressions do the informants use, in Moroccan Arabic and in Dutch, when *introducing* or *maintaining* reference, or *switching* from one referent to another?

- What are the *developmental patterns* that can be found?

- Are there any differences between the *core group* and the *control groups* in all of the cases mentioned in questions listed above? Are there *universal developmental strategies* and/or *language-specific strategies* that the children use? Can any influences of *transfer* be found?

In referring to characters in a story in Dutch, nominal forms and third person pronominal forms can be used. In Dutch an (indefinite or definite) NP (*een*

jongen: 'a boy,' *een hond*, 'a dog,' *de jongen*: 'the boy,' *de hond*, 'the dog') can be seen as the unmarked case for the switching of referents. The pronoun *hij* ('he'; the boy and the dog are both referred to with masculine *hij* in Dutch) can be seen as the unmarked coding for maintenance.

In Moroccan Arabic, nominal forms and third person pronominal forms can be used as well. In Moroccan Arabic, an (indefinite or definite) NP (*waḥed l-weld*, 'a boy,' *waḥed l-kelb*, 'a dog,' *l-weld*, 'the boy,' *l-kelb*, 'the dog')[1] can be seen as the unmarked case for the switching of referents. Zero reference (pro-drop) can be seen as the unmarked coding for maintenance. The pronoun *huwa* ('he'; also in Moroccan Arabic 'the boy' and 'the dog' are both masculine) is used when there is no verb form to enable pro-drop or in the case of emphasis.

On the basis of the above, the following predictions can be made:

- Introduction of reference to a character is done by a nominal in all age groups;
- Switch of reference to a character is done by a pronominal in an early stage of development; in a later stage by definite nominals;
- Maintenance of reference to a character is done by pronominals (and/or zeroes for Moroccan Arabic) in all age groups;
- Moroccan bilingual children will follow the pattern described in (1) to (3), but at a somewhat slower pace than the Dutch and the Moroccan monolingual children.

5.3 DATA COLLECTION, PROCESSING AND ANALYSIS

Stimulus material

The story book used as stimulus material is the *frog story* ("Frog where are you?", by Mercer Mayer, 1969), well known from other studies, such as Slobin (1985), Bamberg (1986, 1987) and Berman (1988). This picture book consists of 24 pictures without any written text (see Appendix IV). The plot is as follows: two main characters, a boy and a dog, are looking for a frog that has escaped from a jar in their house. In searching, both the boy and the dog get involved in different

[1] There are regional varieties for the words used by our informants in referring to the boy and the dog. We have encountered frequent occurrences of *d-derri, l-ɛayel* for 'the boy' and *ž-žru* for 'the dog'. Diminutives such as *l-wliyyed*, 'the little boy', and *l-kliyyeb*, 'the doggie', have also been found on a regular basis. Diminutives have been found in the Dutch retellings as well. Neither regional varieties nor diminutives, of course, have any influence on the analysis of the use of indefinite and definite nouns.

activities and adventures, and in the end there is a final happy reunion. In fact, there are two parallel story lines: the "boy line" and the "dog line". The task of retelling automatically involves the connection of these two parallel story lines and consequently the switching from one referent to another.

Data collection

The children were given the *frog story* booklet. They were asked to look at the pictures for the first time without telling the story, and then tell the whole story on-line, again looking at the pictures. During the narration the researcher played the role of the listener who was attentively following the story line. When the child's narration stopped, the researcher gave some cues to make the child continue the story. These cues were limited to suggestions of continuing the narration ("go on," "what more can you tell?" etc.). Questions directly referring to the content of the story or to the continuation of the plot (like "what does the boy do?", "why is the dog scared?" etc.) were *avoided*, because such questions might have effected the structure of the narrative.

From earlier studies in which narratives were collected through picture retelling, it appears that young children often use deictic reference instead of more anaphoric means to refer to characters from the plot (see for instance Hickmann 1991). It has been argued that this might be due to the fact that child and researcher share the same context, i.e., view the same pictures, so that the child does not necessarily have to spell out all the information to the researcher. Pronouns that are used then, might refer to the actual here-and-now context and are therefore deictic (see also Bamberg 1986). For this reason, the children in our research project were given the instruction to hold the picture booklet without showing it to the researcher. The researcher told the child that (s)he would turn his/her back to the child, to make sure (s)he was unable to look at the pictures. The child was instructed not to show the pictures to the researcher during the narration. This procedure could easily be turned into some sort of a game between researcher and child. Especially the older children understood this very well. The younger children still often used deictic reference, and even tried to make the researcher look at the pictures.

Transcription

The data were transcribed according to the conventions of CHAT, which stands for Codes for the Human Analysis of Transcripts, the coding system of CHILDES, Child Language Data Exchange System (MacWhinney 1991). The Dutch data were transcribed according to the conventional spelling of Dutch, and the Moroccan Arabic data were transcribed in such a way that they still fit the CHAT format. The transliteration system that we used in the database has not been used throughout this book (e.g., in Moroccan Arabic examples) for the sake of readability. For examples of a complete *frog story* in Moroccan Arabic and Dutch, we refer to Appendix V, and for the explanation of the transliteration ('transliteration in texts' and 'transliteration in transcripts') used, to Appendix VI.

Below we present a part of a Moroccan Arabic transcript in CHAT format. The English translation is added for the reader's sake and is not included in the original transcript.

@Stim:	frog story	
*ALI:	kan [/] kan wah2ed l#cayel	there was a boy
	u wah2ed l#kelb u wah2ed j#jrana.	and a dog and a frog
*ALI:	j#jrana kanet fe#wah2ed uh@i +/.	the frog was in a er ...
*HAY:	l#qerca.	jar.
*ALI:	+, &q qraca@.	q qraca.
*ALI:	u [/] u # dik@ l#cayel	and and that (fem.) boy
	msha yences.	went to sleep.
*ALI:	h2etta l#kelb msha yences.	and the dog went to sleep as well.
*ALI:	u dik j#jrana herbat.	and that frog fled.
*ALI:	mnin faqu dik@ l#cayel <u &l>	when they woke up, that (fem.)
	[/] u l#kelb shafu [/] shafu [//]	boy and the dog saw, saw,
	ma#shafu~shi [//] <shafu walu>	did not see, saw nothing,
	[//] ma#shafu~shi uh@i +/.	did not see er ...
*HAY:	j#jrana.	the frog.
*ALI:	+, j#jrana.	the frog.
*ALI:	huma ybaqqshu ybaqqshu.	they searched and searched around
*ALI:	u l#cayel msha [/] msha #	and the boy went went to
	yshuf # uh@i men sh#sherjem.	look er from the window.
*ALI:	u uh@i l#kelb kan cend~u	and er the dog, he had
	# fe#ras~u # dik uh@i +/.	on his head that er ...
*HAY:	qerca.	jar.
*ALI:	+, qerca.	jar.
*ALI:	u l#kelb t2ah2.	and the dog fell.
*ALI:	u l#cayel msha mura~h	and the boy went behind him
	u ## l#qerca therrsat.	and ... the jar had broken.

A limited set of symbols of CHAT has been used in this example. In the first utterance the symbol **[/]** indicates that the word before [/] is repeated after [/]. A slightly different symbol, **[//]**, is used for retracing with correction, as can be seen in the eighth utterance. If more than one word is repeated or corrected, this part of the text is put in pointed brackets <...>, thus indicating the scope of the symbol (see the eighth utterance).

The definite article 'l(e)' is separated by the symbol # from the noun it belongs to. This has been done in order to be able to separate the article from the noun, although in (Standard) Arabic these two are written without separation. All kinds of other prefixes (to nouns and verbs) are indicated by this same symbol. For suffixes the symbol ~ is used, as in the thirteenth utterance. In the second utterance there is a hesitation 'eh' which is marked with **@i** after the hesitation.

This is also done for other interjections. The +/. at the end of the line indicates that the informant stopped at the end of the sentence and hesitated, and that someone else (usually the research assistant) intervened. When the informant then finishes the sentence after this intervention, it starts with +, (fourth utterance). The symbol **&** is used for parts of words that have not been completed.

The symbol @ after a word means there is something special about the word. All kinds of letters can be added after @ (like 'i' for interjection in the second utterance) but this is not necessary. This symbol has been used for example in the fourth utterance, where the informant does not repeat the word the research assistant mentioned in a standard way. In the fifth utterance, the informant uses the wrong demonstrative for 'boy', he should have used *dak*, which is masculine, but instead he uses *dik* which is feminine. The symbols #, ## and ### indicate a pause, depending on the length of the pause (see the twelfth and seventeenth utterances). Incomprehensible output, finally, is indicated by **xx** (phonemes), **xxx** (words) or **xxx xxx xxx** (parts of text).

Data analysis

As mentioned before, this chapter focuses on functions of nominal and pronominal expressions to refer to the two most important characters in the *frog story*, the boy and the dog. The first step in the analysis, therefore, was to give a quantitative account of the distribution of referential devices in the children's narratives. It can be expected that in their narrations, children switch back and forth between the two protagonists of the story, who become involved in different actions. All utterances containing a reference to either the boy or the dog, were selected for analysis. For every reference to the boy or dog, the *type* of reference was identified: the first mention of one of the characters was coded as the introduction of reference. Subsequent mentions in subject position were coded either as switching (if another character was referred to than the one in the preceding utterance) or as maintenance (if the same character was referred to as in the preceding utterance). Elliptic utterances and utterances containing direct quoted speech were not included in the analysis. They were quite infrequent and would have required a relatively far-reaching adaptation of the method of analysis.

Reference to the boy and the dog together ("the boy and the dog," "they") were excluded from the analysis. There is no unambiguity in "they," because the listener knows right away that the boy and the dog, as main protagonists, are referred to. Therefore the predictions mentioned earlier concerning switches and maintenance will not hold for plural reference. Also on the basis of the Aarssen study (1996), it is expected that plural reference will not occur very frequently and those cases that are found will consist of mainly pronominal reference.

All comments the children gave on their own text and all references to situations or events outside the story-line were also left out in the analysis, since they do not form part of the narrative. For example, the second part of the following utterance was not included in the analysis:

de hond valt uit het raam	the dog falls out of the window
wij hebben thuis ook een hond	we too have got a dog at home

The transcripts were analysed line by line and coded according to these guidelines. The next step was to analyse on a micro-level the general patterns and deviations from this general pattern. Moreover, self-repairs were examined in order to gain insight into certain strategies that the children might have used when referring to the characters in their retellings.

5.4 RESULTS

In this section the results of all the groups involved will be presented. We start with the core group of Morocccan bilinguals in both languages, Moroccan Arabic and Dutch. We will maintain the order of: 1. dealing with introduction of the characters, 2. switching from one character to another, and 3. maintaining reference to a character. In the subsequent sections the results of the Dutch monolingual control group and the Moroccan monolingual control group will be dealt with. For the introduction of characters, only the absolute numbers are given, because they will never be higher than 25 (the 25 informants can only introduce each character once) and for the switches and maintenances the absolute numbers as well as percentages are given in the tables. Percentages are in brackets.

5.4.1 Bilingual group in the Netherlands

We will subsequently deal with the devices the bilingual Moroccan informants (core group) use to introduce the boy and the dog, the ways in which they switch reference from the boy to the dog and vice versa and how they maintain reference, whether to the boy or to the dog.

5.4.1.1 Introduction of a referent

In Table 5.1, the devices used for introducing the characters by the Moroccan bilingual children in Moroccan Arabic are shown. Of the 4-year-olds, one child did not want to or was unable to cooperate at all and one child asked the researcher to help him and then imitated the introductions, so these are not included in the table. Of the 6-year-olds, one child's utterance of the first sentence (clearly about the dog) was very difficult to hear, so introduction of the dog was unretraceable. Of the 10-year-olds, one child did not mention the dog at all throughout the story.

Table 5.1 Introduction of a referent in Moroccan Arabic by the bilingual Moroccan children cohorts 1 and 2 (N=25)

	Boy							*Dog*						
Age	4	5	6	7	8	9	10	4	5	6	7	8	9	10
bare N	2	2	3	-	-	1	1	1	-	2	-	2	1	2
indef N	3	3	5	7	22	21	20	1	3	4	6	9	9	8
def N	9	15	14	15	2	2	3	13	20	14	16	14	14	14
Name	1	-	-	-	1	-	1	1	-	-	-	-	-	-
Pro	5	3	2	3	-	1	-	3	3	2	2	-	1	-
Zero	3	1	1	-	-	-	-	4	-	2	1	-	-	-
Total	23	25	25	25	25	25	25	23	25	24	25	25	25	24

There was a clear preference for nouns to introduce both the boy and the dog. For the boy, this slowly changed over time from definite noun to indefinite noun. For the dog this was not the case. There was a striking diversity of devices to introduce the boy and the dog in the case of the youngest children. Even zero references and pronouns were used, which was hardly the case for the older children. This was an expected pattern for young learners, who moved towards an adult-like way of introducing a character in a story by means of an indefinite noun. For the dog, however, this tendency could not be established. This can partly be explained by the fact that very often children introduced the dog by means of a possessive (*a* boy and *his* dog ...,) which was categorized under definite noun for the dog in this table. Another partial explanation might lie in the fact that the dog is a secondary character in the story and was therefore not introduced as transparantly as the boy.

In Table 5.2, the results of this same group of informants in Dutch are shown. Of the 4-year-olds, one child asked for help and then imitated the introductions the researcher used. For the 10-year-olds, there was a technical problem in the case of two informants, which made the first sentence (in which there was very probably an introduction of the boy) of the story inaudible.

Table 5.2 Introduction of a referent in Dutch by the bilingual Moroccan children cohorts 1 and 2 (N=25)

	Boy							*Dog*						
Age	4	5	6	7	8	9	10	4	5	6	7	8	9	10
bare N	7	2	1	-	-	-	1	7	2	1	-	-	1	-
indef N	4	1	3	8	18	20	17	4	1	2	7	13	14	10
def N	13	19	19	12	7	4	2	13	22	22	18	12	10	15
Name	-	-	1	1	-	1	3	-	-	-	-	-	-	-
Pro	1	2	1	4	-	-	-	-	-	-	-	-	-	-
Zero	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Total	25	25	25	25	25	25	23	24	25	25	25	25	25	25

The youngest children showed a rather diverse pattern of devices, although less diverse than in Moroccan Arabic. Older children (8-10 years old) showed a clear preference for definite nouns to introduce both the boy and the dog. A change took place around the age of 8, when the children also started using more indefinite nouns. This last change also applied, to some extent, to the dog, as opposed to what we saw for Moroccan Arabic.

5.4.1.2 Switching of reference

In Tables 5.3 and 5.4, the numbers and percentages of switches in Moroccan Arabic are displayed. The youngest group (4- to 7-year-olds) is presented in Table 5.3 and the older group (8- to 10-year-olds) in Table 5.4. Tables 5.5 and 5.6 represent the results for Dutch.

Table 5.3 Switching of a referent in Moroccan Arabic by the bilingual Moroccan children cohort 1 (N=25)

	Boy				*Dog*			
Age	4	5	6	7	4	5	6	7
bare N	13 (5)	1 (0)	9 (4)	-	6 (3)	3 (2)	8 (5)	-
ind N	2 (0)	3 (1)	1 (0)	1 (0)	2 (1)	-	-	-
def N	70 (28)	107 (43)	90 (39)	112 (56)	123 (69)	148 (83)	136 (80)	123 (92)
Name	10 (4)	-	-	-	2 (1)	-	6 (3)	-
Pro	103 (42)	60 (24)	56 (24)	36 (18)	31 (17)	17 (9)	12 (7)	9 (7)
Zero	50 (20)	77 (31)	75 (33)	51 (26)	14 (8)	11 (6)	9 (5)	1 (1)
Total	248	248	231	200	178	179	171	133

The 18 mentions of a proper noun (name) in Table 5.3 refer to "names" (babytalk) the youngest children sometimes gave to the boy or the dog, such as *bubbu/bubbuɛ* ('bogey man') for both the boy and the dog, *mummu/mummuɛ* ('small baby') for the boy, and the onomatopaeic *ɛabɛab* ('woof woof') for the dog. These did not take the definite article in any case, but cannot be regarded as bare nouns either, so they were categorized as Names. For the rest we did not see any mentions of proper nouns for this youngest group of informants.

Table 5.4 Switching of a referent in Moroccan Arabic by the bilingual Moroccan children cohort 2 (N=25)

	Boy			*Dog*		
Age	8	9	10	8	9	10
bare N	-	1 (0)	5 (3)	6 (4)	1 (0)	6 (6)
ind N	1 (0)	-	1 (0)	-	-	1 (0)
def N	152 (63)	119 (63)	107 (58)	140 (91)	106 (89)	93 (86)
Name	10 (4)	-	17 (9)	-	-	-
Pro	29 (12)	25 (13)	18 (10)	3 (2)	3 (3)	4 (4)
Zero	51 (21)	43 (23)	36 (20)	5 (3)	9 (8)	4 (4)
Total	243	188	184	154	119	108

For the youngest children, we saw a of predominant use of definite nouns to switch to the dog and the use of definite nouns, pronouns and zero references to switch to the boy. It seems that the informants found it necessary to refer to the dog in a transparant way, and at the same time did not deem this necessary for reference to the boy.

For the older children we observed the same pattern as for the younger children, but much clearer. For the dog, the most preferred way of referring to it in the case of a switch was a definite noun. For the boy this was also the case, but not as obviously as for the dog. There were more pronouns and zero references to the boy than to the dog. We saw that there were not many mentions of proper nouns to refer to the boy or the dog and almost no instances of bare nouns and indefinite nouns.

In Tables 5.5 and 5.6, the numbers and percentages of switches in Dutch are displayed. The youngest group (4- to 7-year-olds) is presented in Table 5.5 and the older group (8- to 10-year-olds) in Table 5.6.

Table 5.5 Switching of a referent in Dutch by the bilingual Moroccan children, cohort 1 (N=25)

	Boy				*Dog*			
Age	4	5	6	7	4	5	6	7
bare N	55 (24)	5 (2)	1 (0)	-	59 (33)	9 (5)	2 (1)	1 (0)
ind N	10 (4)	-	-	-	9 (5)	-	-	-
def N	106 (46)	149 (60)	114 (49)	141 (59)	97 (54)	150 (84)	132 (92)	137 (93)
Name	-	-	4 (2)	1 (0)	-	-	-	-
Pro	52 (23)	89 (36)	111 (48)	99 (41)	12 (7)	18 (10)	10 (7)	9 (6)
Zero	7 (3)	5 (2)	3 (1)	-	3 (1)	1 (0)	-	-
Total	230	248	233	241	180	178	144	147

Table 5.6 Switching of a referent in Dutch by the bilingual Moroccan children, cohort 2 (N=25)

	Boy			*Dog*		
Age	8	9	10	8	9	10
bare N	1 (0)	-	1 (0)	-	1 (0)	-
ind N	1 (0)	-	-	-	1 (0)	1 (0)
def N	137 (67)	134 (64)	100 (51)	114 (97)	130 (98)	115 (90)
Name	7 (3)	29 (14)	50 (26)	-	1 (0)	9 (7)
Pro	59 (29)	46 (22)	45 (23)	3 (3)	-	3 (2)
Zero	-	-	-	-	-	-
Total	205	209	196	117	133	128

The 4-year-olds used quite a considerable number of bare nouns to switch to the boy and the dog (55 and 59 times respectively). After this age this hardly happened anymore. Most native speakers of Dutch would not find it grammatical to use bare nouns in this way in Dutch and the same holds for Moroccan Arabic. It is clearly a developmental feature that children did not resort to anymore from age 5 onwards. Also remarkable were the occurrences of zero references. Pro-drop is not common in Dutch either. Ellipsis of pronouns can be applied for stylistical purposes in narratives, in describing a series of actions that happen one immediately after the other. This, however, was never the case here.

In most utterances where children switched reference to the boy and the dog, the same pattern applied to Moroccan Arabic: in switching reference to the dog, the children used nominal forms in almost all cases, whereas in the case of the boy a large number of pronominals was still used.

The same pattern that appeared in Tables 5.3 and 5.4 can be witnessed in Tables 5.5 and 5.6. Here, too, the differences between nominal and pronominal forms in reference to the boy were marginal, whereas in reference to the dog they were great.

5.4.1.3 Maintenance of reference

In Tables 5.7 and 5.8, the numbers and percentages of reference maintenance in Moroccan Arabic are displayed. Data of the youngest group (4- to 7-year-olds) are presented in Table 5.7 and data of the older group (8- to 10-year-olds) in Table 5.8. Tables 5.9 and 5.10 represent the results for Dutch.

Table 5.7 Maintenance of a referent in Moroccan Arabic by the bilingual Moroccan children cohort 1 (N=25)

	Boy				*Dog*			
Age	4	5	6	7	4	5	6	7
bare N	1 (0)	-	1 (0)	1 (0)	1 (1)	-	3 (4)	-
ind N	2 (1)	-	1 (0)	2 (1)	-	-	-	-
def N	44 (19)	35 (15)	22 (12)	49 (27)	21 (23)	20 (36)	32 (44)	17 (45)
Name	1 (0)	-	-	-	-	-	-	-
Pro	72 (32)	60 (26)	25 (13)	38 (21)	29 (33)	9 (16)	9 (12)	3 (8)
Zero	106 (47)	137 (59)	143 (75)	93 (51)	38 (43)	27 (48)	29 (40)	18 (47)
Total	226	232	192	183	89	56	73	38

Table 5.8 Maintenance of a referent in Moroccan Arabic by the bilingual Moroccan children cohort 2 (N=25)

	Boy			*Dog*		
Age	8	9	10	8	9	10
bare N	-	-	1 (0)	-	-	1 (3)
ind N	3 (2)	-	1 (0)	-	-	-
def N	21 (10)	23 (12)	30 (15)	15 (43)	17 (38)	10 (33)
Name	2 (1)	-	4 (2)	-	-	-
Pro	22 (11)	29 (16)	26 (13)	7 (20)	8 (18)	2 (7)
Zero	156 (76)	136 (72)	139 (69)	13 (37)	20 (44)	17 (57)
Total	204	188	201	35	45	30

The majority of the children aged 4 to 7 (Table 5.7) used pronouns and zero references when they maintained reference to the boy (79%, 85%, 88%, and 72% respectively). For the dog, there was a more even distribution of usage of nouns on the one hand and pronouns and zero references on the other.

The older children (Table 5.8) all showed a clear preference for pronominal and zero reference in cases where they maintained reference either to the boy or to the dog, although in the case of the dog the preference was less clear than for the boy.

Table 5.9 Maintenance of a referent in Dutch by the bilingual Moroccan children, cohort 1 (N=25)

	Boy				*Dog*			
Age	4	5	6	7	4	5	6	7
bare N	19 (10)	1 (0)	-	-	9 (11)	-	-	-
ind N	7 (4)	-	-	-	1 (1)	-	-	-
def N	58 (29)	46 (18)	28 (11)	56 (23)	20 (25)	17 (35)	18 (42)	19 (58)
Name	-	-	2 (0)	2 (0)	-	-	-	-
Pro	104 (52)	204 (78)	228 (86)	178 (74)	42 (53)	31 (65)	24 (56)	12 (36)
Zero	12 (6)	11 (4)	7 (3)	5 (2)	8 (10)	-	1 (2)	2 (6)
Total	200	262	265	241	80	48	43	33

Table 5.10 Maintenance of a referent in Dutch by the bilingual Moroccan children, cohort 2 (N=25)

	Boy			*Dog*		
Age	8	9	10	8	9	10
bare N	-	-	-	-	-	-
ind N	-	1 (0)	-	-	-	-
def N	38 (23)	22 (11)	26 (11)	12 (36)	11 (35)	12 (29)
Name	1 (0)	8 (4)	10 (4)	-	-	3 (7)
Pro	119 (73)	149 (74)	149 (65)	20 (61)	19 (61)	22 (52)
Zero	5 (3)	21 (10)	46 (20)	1 (3)	1 (3)	5 (12)
Total	163	201	231	33	31	42

The children had a preference for pronominal forms when maintaining reference to the boy. Apart from the 4-year-olds, all children predominantly used pronouns to maintain reference to the boy and used a more divergent distribution over definite nouns and pronouns for maintaining reference to the dog.

Some observations on the results of the bilingual children can be made at this point. First of all, two developmental issues emerged: proper nouns were used from age 6 onwards, but not earlier and still not very often until age 9. Also, there were very few occurrences of bare nouns and indefinite nouns after age 4 in either switch of reference or maintenance of reference.

Second, there were very few occurrences of maintaining reference to the dog compared to occurrences of maintaining reference to the boy. This very probably is related to the fact that the boy is the main character in the story and the dog is a minor character: one utterance on the dog and then several utterances on the boy results in only switches to the dog and both switches to and maintenance of the boy.

In the third place, there were high percentages of occurrences of definite nouns in case of switching reference to the dog. This is also probably be due to the fact that the children saw the boy as the main character and therefore did not

always feel the need to make reference to the boy explicit. For the dog this was not the case, resulting in full nouns when reference was switched to the dog.

5.4.2 Dutch control group

We will subsequently deal with the devices the monolingual Dutch children (control group) use to introduce the boy and the dog, the ways in which they switch reference from the boy to the dog and vice versa, and how they maintain reference, whether to the boy or to the dog.

5.4.2.1 Introduction of a referent

In this section, we present and discuss the results of the devices children of the Dutch control group use to introduce the two characters. For the 5-year-olds, one session is missing on tape. And for the 10-year-olds, the first half of the first sentence of one informant is inaudible on tape.

Table 5.11 Introduction of a referent in Dutch by the Dutch monolingual children cohorts 1 and 2 (N=25)

	Boy							*Dog*						
Age	4	5	6	7	8	9	10	4	5	6	7	8	9	10
bare N	1	1	2	-	-	-	3	1	1	1	-	1	-	4
indef N	7	4	6	5	7	7	7	8	5	3	4	6	3	5
def N	13	13	12	18	8	7	6	15	16	20	20	15	20	14
Name	-	1	1	1	9	10	9	-	-	-	-	2	2	1
Pro	4	5	4	1	1	1	-	1	2	1	1	1	-	-
Zero	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	25	24	25	25	25	25	25	25	24	25	25	25	25	24

The Moroccan bilingual children used definite nouns and later on indefinite nouns to introduce the boy in Dutch. The monolingual Dutch children started out with mainly definite nouns as well, but ended up at age 10 with an equal distribution of introducing the boy by means of indefinite nouns, definite nouns and proper nouns. The last category is one the Moroccan children hardly made any use of (except for the 9- and 10-year-olds in the case of switching to the boy - Table 5.6).

With regard to reference to the dog, there was a clear preference for definite nouns as a means to introduce this character. This applied to all ages. It seems more in agreement with what the Moroccan children did, although they showed a gradual development towards the use of indefinite nouns as well, something the Dutch children do not seemed to do.

A striking fact is the occurrence of bare nouns (3 for boy, 4 for dog) by way of introduction for the 10-year-olds. One would expect a more adult-like

introduction by means of an indefinite or definite noun from these informants. What these children did, however, was starting the retelling by saying: "Boy and dog. The boy and the dog sit in their room and watch the frog," as if they gave the story a headline or a title, before starting the actual retelling. There is a series of stories in the Netherlands that is called *kikker en pad* ('frog and toad'). This series is very popular among this age group. This also might be an explanation for the use of bare nouns for introduction. If we look at the second utterance, the children, without exception, used definite nouns to refer to the boy and the dog.

5.4.2.2 Switching of reference

This section describes the children's use of nominal and pronominal forms to refer to the two protagonists in the story, in those utterances where they switch reference from one character to the other. Table 5.12 gives the numbers and percentages of forms used by Dutch children for switching to another referent.

Table 5.12 Switching of a referent in Dutch by the Dutch monolingual children cohort 1 (N=25)

	Boy				*Dog*			
Age	4	5	6	7	4	5	6	7
bare N	12 (6)	2 (0)	8 (3)	8 (3)	6 (4)	3 (2)	5 (3)	4 (2)
ind N	9 (4)	-	1 (0)	1 (0)	3 (2)	2 (1)	2 (1)	-
def N	94 (45)	99 (46)	138 (55)	165 (67)	135 (87)	134 (91)	163 (91)	173 (94)
Name	-	4 (2)	6 (3)	7 (3)	-	-	-	-
Pro	85 (41)	108 (51)	96 (39)	65 (27)	7 (4)	9 (6)	9 (5)	8 (4)
Zero	8 (4)	1 (0)	-	-	4 (3)	-	-	-
Total	208	214	249	246	155	148	179	185

As can be seen in Table 5.12, the 4-year-old Dutch children preferred nominal forms in cases where they switched to the boy. Although at age 4 differences between nominal and pronominal forms were marginal, 8-year-olds clearly preferred nominal forms. Here, too, we see that only the youngest children made use of zero references. The older children already acquired the knowledge that pro-drop is not common in Dutch.

Table 5.13 Switching of a referent in Dutch by the Dutch monolingual children cohort 2 (N=25)

	Boy			*Dog*		
Age	8	9	10	8	9	10
bare N	-	1 (0)	1 (0)	-	2 (1)	3 (2)
ind	-	-	-	-	-	-
Ndef N	125 (47)	99 (46)	90 (40)	168 (83)	114 (78)	129 (81)
Name	87 (33)	81 (37)	86 (39)	26 (13)	29 (20)	23 (14)
Pro	54 (20)	35 (16)	46 (21)	8 (4)	2 (1)	4 (3)
Zero	-	1 (0)	-	-	-	-
Total	266	217	223	202	147	159

In the utterances where Dutch children switched reference to the dog we witnessed a predominant use of nominal forms. The overall pattern of switching devices used by the Dutch children was similar to that of the Moroccan children in Dutch: they preferred nominal forms. One difference with Table 5.5 is that the 4-year-olds hardly used any bare nouns to switch to the boy and the dog, whereas the Moroccan 4-year-olds did so in 24% and 33% of the cases respectively. This we can interpret as a developmental feature, regarding which the Moroccan children lag behind the Dutch children about 1 year. This is not very surprising for a group of children some of whom do not speak any Dutch at all when they enter school. Another difference is the distribution of proper nouns for the children of cohort 2. The Dutch 8-, 9- and 10-year-olds switched to the boy by means of a proper noun in 33%, 37% and 39% of the occurrences respectively, whereas for the Moroccan children these figures were 3%, 14% and 26% respectively. With regard to the dog, these figures were 13%, 20% and 14% for the Dutch children and 0%, 0% and 7% for the Moroccan children respectively. We see that the Moroccan children, until a fairly high level in primary education, hardly made use of this device at all.

5.4.2.3 Maintenance of reference

A similar analysis was made of devices for maintaining reference to the characters in the *frog story*. Tables 5.14 and 5.15 give the numbers and percentages for the Dutch monolinguals.

With respect to the forms Dutch children used for maintaining reference to the boy, it is clear that the children in all age groups preferred pronominal forms. In references to the dog, there was a more even distribution between pronouns and nouns. Again, these figures were highly comparable to those of the Moroccan bilingual children in Tables 5.9 and 5.10.

Table 5.14 Maintenance of a referent in Dutch by the Dutch monolingual children cohort 1 (N=25)

	Boy				*Dog*			
Age	4	5	6	7	4	5	6	7
bare N	6 (4)	3 (2)	-	1 (0)	1 (2)	1 (2)	-	2 (3)
ind N	1 (0)	-	-	-	-	-	-	-
def N	40 (24)	26 (13)	33 (20)	29 (22)	11 (27)	21 (47)	22 (46)	30 (51)
Name	-	4 (2)	1 (0)	-	-	-	-	-
Pro	120 (71)	164 (83)	120 (73)	94 (72)	27 (66)	22 (49)	26 (54)	26 (44)
Zero	2 (1)	1 (0)	10 (6)	6 (5)	2 (5)	1 (2)	-	1 (2)
Total	169	198	164	130	41	45	48	59

Table 5.15 Maintenance of a referent in Dutch by the Dutch monolingual children cohort 2 (N=25)

	Boy			*Dog*		
Age	8	9	10	8	9	10
bare N	-	1 (0)	-	-	-	1 (2)
ind N	-	-	-	-	-	-
def N	14 (9)	16 (9)	18 (9)	19 (27)	8 (21)	12 (24)
Name	21 (13)	14 (8)	15 (8)	5 (6)	5 (13)	3 (6)
Pro	118 (72)	127 (69)	144 (75)	43 (61)	20 (51)	26 (52)
Zero	11 (6)	25 (14)	15 (8)	4 (6)	6 (15)	8 (16)
Total	164	183	192	71	39	50

5.4.3 Moroccan control group

We will subsequently deal with the devices the monolingual children of the Moroccan control group used to introduce the boy and the dog, the ways in which they switched reference from the boy to the dog and vice versa, and the ways in which they maintained reference, either with regard to the boy or to the dog.

5.4.3.1 Introduction of a referent

The devices used by the Moroccan monolingual children to introduce the boy and the dog are displayed in Table 5.16.

Even though there were only 3 age groups to observe here, the same pattern evolved that we saw in Table 5.1 for the bilingual Moroccan children in Moroccan Arabic: a preference for definite nouns to introduce the boy and the dog at a young age, which stayed the same for the dog, but slowly changed into a preference for indefinite nouns as a means to introduce the boy. Here, too, we

witness the appearance of bare nouns as a device for introduction at a rather late age (cf. Table 5.11, monolingual Dutch children aged 10).

Table 5.16 Introduction of a referent in Moroccan Arabic by the monolingual Moroccan children (N=25)

	Boy			*Dog*		
Age	5	7	9	5	7	9
bare N	-	-	1	1	-	6
ind N	2	5	15	1	3	4
def N	18	16	6	21	20	13
Name	1	-	-	-	-	-
Pro	3	3	1	1	1	-
Zero	-	-	-	-	-	-
Total	24	24	23	24	24	23

5.4.3.2 Switching of reference

Table 5.17 represents the results for the numbers and percentages of switches from one referent to the other, by the monolingual Moroccan children living in Morocco.

Table 5.17 Switching of a referent in Moroccan Arabic by the monolingual Moroccan children (N=25)

	Boy			*Dog*		
Age	5	7	9	5	7	9
bare N	-	-	-	-	-	-
ind N	7 (3)	2 (1)	-	2 (1)	-	-
def N	140 (56)	128 (52)	130 (63)	166 (86)	182 (90)	142 (87)
Name	12 (5)	1 (0)	-	-	-	-
Pro	58 (23)	74 (30)	45 (22)	18 (9)	13 (6)	17 (10)
Zero	33 (13)	42 (17)	31 (15)	7 (4)	8 (4)	5 (3)
Total	250	247	206	193	203	164

Here again we see that the pattern for bilingual and monolingual children is highly comparable. Tables 5.3 and 5.4 showed that for reference to the boy the use of definite nouns on the one hand and zero references and pronominals on the other were alternated, and that for the dog there was a predominant use of definite nouns.

5.4.3.3 Maintenance of reference

For maintenance of reference, the results can be found in Table 5.18, displaying the total of occurrences of maintaining reference to one and the same character, whether this is the boy or the dog.

Table 5.18 Maintenance of a referent in Moroccan Arabic by the monolingual Moroccan children (N=25)

	Boy			*Dog*		
Age	5	7	9	5	7	9
bare N	-	-	-	-	-	-
ind N	2 (1)	1 (0)	-	1 (1)	-	-
def N	37 (22)	34 (23)	19 (13)	39 (43)	32 (48)	12 (25)
Name	7 (4)	-	-	-	-	-
Pro	40 (24)	46 (31)	41 (27)	5 (6)	14 (21)	7 (14)
Zero	79 (48)	66 (45)	90 (60)	45 (50)	21 (31)	30 (61)
Total	165	147	150	90	67	49

The general pattern is the same as in Tables 5.7 and 5.8: for the boy mainly zero reference and pronouns, for the dog definite nouns on the one hand and zero references and pronouns on the other. This pattern is the exact opposite of what the tables on the switching of reference showed us.

5.5 CONCLUSIONS AND DISCUSSION

The results that were presented in the previous sections, gave us (positive or negative) evidence for the predictions we made in the beginning of this chapter. Our first prediction, concerning the expected preference for nominals in the case of introduction of a character, was confirmed. As early as age four, the children seemed to have acquired this general principle. This result is comparable to what Bamberg (1987) found for L1 German-learning children.

Prediction 2, regarding switch of reference, was partly confirmed. It was not clear from our data that the younger children preferred pronominals when referring to the boy. The older children clearly chose NPs in this case. Switches to the dog were almost without exception made by means of nominals by all children.

The third prediction, concerning maintenance of reference, was confirmed with respect to references to the main character, and with respect to the references Dutch children made to the dog. The Moroccan children, however, hade a preference for nominals in the case of reference maintenance to the dog. It should be kept in mind, though, that there were very few cases of maintenance of reference to the dog.

Our fourth prediction, regarding differences between L1 and L2 learners of Dutch, seemed to be confirmed. The results of the Moroccan children were quite similar to those of the Dutch children. There did not seem to be a structural difference, but only a difference in rate. The "slower pace" we predicted, however, cannot account for all the differences found between L1 and L2 learners.

Therefore, we will have a more detailed look at those occurrences that did not support our predictions in the following section. We will look at possible strategies children use in these cases from a more qualitative perspective. As we will see, in some cases particular developmental features may explain the choice of a certain form of reference. Sometimes more pragmatic motivations underlie this choice. Finally, we will discuss how our method of analysis may have influenced the results.

5.5.1 Developmental features

Regarding the differences between the older and the younger Moroccan children, we saw that, in the case of reference maintenance, the younger children made more references to the dog and the older children more to the boy (cf. Tables 5.7/5.8, 5.9/5.10 and 5.18). The older children already acquired the ability to differentiate between the major character and a minor character, whereas the younger children had not yet reached this stage. For the younger children, we can state that whoever they referred to first, or encountered first in their retelling, they saw as the main character, whom they kept on referring to more than the older children. Even when the older children started out with the dog as a subject in the beginning of the story, they switched to the boy as soon as they realized that, as a human being, he is more likely to play the main role than the dog, as an animal.

The younger children made relatively more "unclear" references than the older children. By this we mean that they made more use of pronominals and zero reference in the case of switching. Older children are beyond this stage and were better aware in what cases they had to be completely clear and when this was not entirely necessary.

Some of the younger children used zeroes for the introduction of a character. This could not be witnessed for the older children. Also the use of proper nouns for the 4-year-old Moroccan children needs some explanation, because the children did not really give names to the characters but used nicknames that they know from, and are used in story-tellings, such as "puppet," "bogey man," etc. The adult-like use of proper nouns did not appear in the retellings of the Moroccan children until they were aged 9.

The inability to interpret two or more subsequent pictures as a combined narrative that some young children displayed seems to explain some of the cases where the youngest children differed from the older children. The younger ones tended to treat the pictures in isolation. This resulted in full noun phrases

(sometimes even indefinite) in cases where reference was maintained and therefore contradicted prediction number 3:

(1) *hij is hier een kindje. en nog een kindje [/] kindje en nog een kindje.*
he is here a child. and another child [/] child and another child.
(Kevin, monolingual Dutch boy, 4 years old, in Dutch)

In some cases, young children seemed to be aware of the existence of certain strategies when referring to characters in a story. They monitored and repaired their speech. Most cases of self-repair were of the kind pronominal → nominal:

(2) *hier kijken [///] kijkt hij [///] jongen in de raam.*
here look [//] looks he [//] boy in the window.
(Mohammed, bilingual Moroccan boy, 4 years old, in Dutch)

(3) *ging ze [///] die hond dat opeten.*
went she [//] that dog that eat.
(Ryan, monolingual Dutch boy, 4 years old, in Dutch)

5.5.2 Pragmatic motivations / strategies

Episode boundaries
Many cases in which a nominal form was used for maintenance of reference can be explained by the fact that at that particular place in the narrative a new episode began ("episode boundary"). The child "reintroduced" the character by a nominal, in cases that were listed as maintenance in this study (contradicting prediction 3):

(4) *het hond viel naar beneden. het jongetje ging hem achterna en hield hem stevig vast. het jongetje zei "kom gaan we het kikkertje zoeken".*
the dog fell down. the boy went after him and held him tight. the boy said "come on, let's go find the frog."
(Ali, bilingual Moroccan boy, 8 years old, in Dutch)

(5) *toen viel die hond en die jongen ook. toen vielden ze in dat water. en toen viel die jongen. de jongen was achter een boomstam.*
then that dog fell and that boy too. then they felled in that water. and then that boy fell. the boy was behind a treetrunk.
(Siham, bilingual Moroccan girl, 8 years old, in Dutch)

Linear distance
Sometimes children used a nominal form for maintenance in cases where a pronoun would make the sentence difficult to interpret. These cases, again,

contradicted prediction 3. In the following examples, Wanda uses a noun to avoid difficulty in pinpointing the actor, and Ryan makes use of a noun, because between this form and the previous one, he clarifies the object in a number of utterances. The distance between the two references to the boy seems to make a full NP necessary.

(6) *en toen zat dat jongetje ineens <met z'n &ho> [///] met z'n eigen hond op z'n hoofd. en toen &w kwam dat jongetje d'r uit.*
and then that boy suddenly sat <with his &do> [//] with his own dog on his head. and then &w came that boy out of it.
(Wanda, monolingual Dutch girl, 8 years old, in Dutch)

(7) *ging die met een kikkertje pakken. een kleine. niet een grote. of niet die vader en <de moeder> [///] die moeder. en dan ging **die kindje** met die hond eh een kikker pakken.*
he went to catch with a frog. a little one. not a big one. or not the father and <the mother> [//] that mother. and then that child with the dog went to catch er a frog.
(Ryan, monolingual Dutch boy, 4 years old, in Dutch)

Mistakes / self-repairs
The utterance in the next example emerges after the boy has already been introduced. There would have been no need to use the indefinite article for the boy, but Nabil first thinks it's a girl and subsequently introduces her as a new character. Then he realizes the mistake, corrects "girl" to "boy" and copies the indefinite article at the same time.

(8) *<u waḥed l-bnita kanet &naϵ> [///] u waḥed l-wliyyed kan naϵes.*
<and a girl was &slee> [//] and a boy was sleeping.
(Nabil, monolingual Moroccan boy, 7 years old, in Moroccan Arabic)

Clarifications
Sometimes a child did not seem quite sure whether the reference would be completely clear to the listener and a clarification was added in or to the utterance. In the following example "that dog" is mentioned as an addition to the subject "he".

(9) *u kan ϵawed huwa ka-yϵeyyeṭ l-u **dik ž-žru**.*
and again he was calling him, that dog.
(Bilal, bilingual Moroccan boy, 4 years old, in Moroccan Arabic)

This usually happened in cases when the first utterance was a switch, for which the child used a PRO or a ZERO. The child then felt the need to make the reference more transparant and added an utterance with a full NP. This resulted in our schemas in one PRO or ZERO for switch and one definite NP for maintenance, both exactly the opposite of our predictions 2 and 3:

(10) *huwa ka-yšuf.* ***l-ϵayel*** *ka-yšuf.*
he is looking. the boy is looking.
(Mustafa, bilingual Moroccan boy, 4 years old, in Moroccan Arabic)

(11) *ka-yelḥes.* ***dik ž-žru*** *ka-yelḥes.*
∅ is licking. that dog is licking.
(Mustafa, bilingual Moroccan boy, 4 years old, in Moroccan Arabic)

Knowledge of the world

In some cases in which a pronoun was used in the case of switching of reference (contradicting prediction 2), there could be no difficulty in pinpointing of the referent. The dog cannot "call" or "dress" or "speak," whereas it is unlikely that the boy will "lick" the dog. In other cases, the right referent could be inferred by merely listening to the context of the story, so there was no need for the narrator to be explicit about the identity of the subject or the actor.

(12) *en een hond komt. <gaat &o> [///] gaat boven hem slapen. en [/] en* ***hij*** *gaat aankleden.*
and a dog comes. <goes &o> [//] goes to sleep above him. and [/] and he (= boy) goes to dress.
(Maria, bilingual Moroccan girl, 8 years old, in Dutch)

(13) *een kikker die gaat uit [/] uit de pot. en toen zei* ***die*** *"waar is dat geweest?".*
a frog he gets out [/] out of the jar. and then he (= boy) said "where has that one been?".
(Kees, monolingual Dutch boy, 4 years old, in Dutch)

In the last utterance of the next example the subject is clear, although it was not the subject of the previous sentence (which is the jar, *that thing*). In the previous sentences there have been several references to the dog (his head, his neck, to him) which make it obvious that he must be the subject of the clause *bqa yϵeyyet.* This construction causes a ZERO to occur in the case of a switch of reference, in contradiction to prediction 2:

(14) *ža l-kelb. dexxel* ***ras-u*** *fe-hadik lli kanet fe-ha l-qerqra. u bqa ḥaṣel l-u* ***ϵenq-u****. hnaya ϵad baqi* ***l-u*** *hadik u hna bqa yϵeyyeṭ.*

the dog came. ∅ (= dog) entered his head in that thing in which the frog had been. and ∅ (= jar) stayed stuck on his neck. here that thing was still on him and here ∅ (= dog) began to shout.
(Saad, monolingual Moroccan boy, 7 years old, in Moroccan Arabic)

The same holds for example (15), where the chronological sequence of the story and the reference *his head* are enough to inform the listener that the subject of the second utterance is the dog:

(15) ***ras-u*** *fe-l-buqala. ka-yebqa yšuf fe-hadi.*
his head was in the jar. ∅ (= dog) kept on looking in that.
(Abdella, monolingual Moroccan boy, 7 years old, in Moroccan Arabic)

Topicalisation
Another feature, which concerns Moroccan Arabic only, and which causes some concern for our data analysis, is what Harrell (1962) calls the *prestated topic*:

"A common expansion of the elementary simple sentence (verb-object -PB) (...) is the **prestated topic**. The prestated topic is a noun or pronoun which is placed at the beginning of a sentence and which refers to a pronoun, either independent, suffixed, or signaled by verb inflection, occurring later in the sentence" (Harrell 1962:160).

The consequence of this is that the focus of the sentence is not the same as the subject. Because of our way of analysing we encountered some problems here. In the next utterance, for instance, the subject is the deer (zero reference), so this utterance was not included in our analysis, but the focus is on *weld* (boy), which would be an argument for inclusion of these kinds of sentences:

(16) *had l-weld ṭeyyḥat-u u bkat.*
this boy, ∅ (= fem. = the deer) made him fall and ∅ (= fem. = the deer) laughed.
(Hanna, monolingual Moroccan girl, 7 years old)

In the following examples, we have as subjects: *ḍ-ḍifḍaɛa* ('the frog'), *l-frixa* ('the mouse'), *l-buma* ('the owl') and *n-nḥel* ('the bees') respectively, while the focus is on *l-weld* ('the boy'), *had l-weld* ('this boy'), *d-derri* ('the boy') and *l-kelb* ('the dog') respectively. This means that all sentences similar to these were not included in the set of utterances that were analysed (because the subject was not either the boy or the dog), although the focus is on the boy and/or the dog in each of these utterances:

(17) *l-weld ϵeddat-u ḍ-ḍifḍaϵa.*
the boy, the frog bit him.
(Laila, monolingual Moroccan girl, 7 years old)

(18) *u had l-weld eh laḥet-u l-frixa.*
and this boy, er the mouse threw him.
(Khalid, bilingual Moroccan boy, 4 years old)

(19) *d-derri defϵat-u l-buma u l-kelb tebϵ-u n-nḥel.*
the boy, the owl pushed him and the dog, the bees followed him.
(Faysal, monolingual Moroccan boy, 9 years old)

Animacy / inanimacy
Another pragmatic consideration concerns the differences we found between references to the boy on the one hand and the dog on the other. We predicted nominals for switching of reference, especially for the older children. This was confirmed in the case of the dog. Nevertheless, it appears that about one third of all children (somewhat under 30% for the Dutch retellings (Moroccan and Dutch informants) and somewhat over 30% for the Moroccan retellings (monolingual informants)) switched to the boy by means of pronominals. It seems that the prominence of the main character (the boy) caused these differences. The use of a pronoun when referring to the main character leads to a less problematic interpretation than the use of a pronoun when the secondary character is referred to.

5.5.3 Methodological considerations

Because of the extensive database, we had to limit ourselves in our analysis. The fact that we only took references in subject position into account needs attention. In cases where the referent has already been mentioned in a previous sentence in a non-subject position, pronominal reference can be expected and be fully acceptable and understandable for the listener:

(20) *en eh en toen was die hond bij eh die jongen zijn hoofd gegaan. en toen ging **die** daar bij die boom klimmen. toen eh ging de hond ook naar die boom klimmen.*
and er and then that dog had gone at er that boy's head. and then that one (=boy) went climbing there at that tree. then er that dog also went climbing to that tree.
(Ouafaa, bilingual Moroccan girl, 8 years old, in Dutch)

Plural reference was not included in the analysis (see Section 5.3, *Data analysis*), although in a number of utterances the children referred to the boy and the dog

as plural subject, either by means of a nominal ("the boy and the dog") or pronominal ("they") or by means of zero-reference. This may have had some influence on the results. The examples we found in our data seemed to explain some of the instances of pronominal switches, e.g., where in the previous sentence(s) the referents had both been mentioned. In the following example, the use of "he" for the boy is perfectly clear (becoming even clearer if we look at the last sentence of the example), but, as we did not include plural reference in our analysis, "he" was listed as a pronoun in the case of switch, thus contradicting prediction 2:

(21) *toen gingen* ***ze*** *op het [/] het dinges vallen. en toen <had ie> [//] was* ***tie*** *op het water gevallen. en toen ging tie z'n hond pakken.*
then they went to fall on the [/] the what's its name. and then <he was> [//] he (= boy) had fallen on the water. and then he went to get his dog.
(Asma, bilingual Moroccan girl, 6 years old, in Dutch)

Some final remarks are in order here on the differences between the Moroccan Arabic of the bilinguals on the one hand and of the monolinguals on the other, and the Dutch of the bilinguals on the one hand and of the monolinguals on the other. We have seen (Tables 5.1, 5.2, 5.11, 5.16) that for the introduction of reference there were not many essential differences (regarding pronominal or nominal reference) between the groups, after the age of 4. We have observed, however, that the monolingual Dutch children used far more proper nouns than the bilingual children did. For switches we can say about the same. There were no great differences between the bilingual group and the monolingual groups, except for the fact that the 4-year-old bilinguals in Dutch used far more bare nouns than the monolingual Dutch children and that, again, the Dutch monolinguals used more proper nouns than the bilingual children in Dutch. For maintenance of reference we have seen that also for this category there were hardly any differences. The only observed difference was the fact that the bilingual children made more use of nominal reference in the case of the dog.

The predicted slower pace in the acquisition of reference to protagonists could not be supported. The same was found in the Aarssen study: "... cross-linguistically, there is a high degree of similarity. There seem to be conventional ways for reference introduction, maintenance and shift which are valid in two languages which are typologically very different" (1996:121). Although we see that the 4-year-old bilinguals had not yet mastered the rule that a bare noun in Dutch is not the most common way of referring to protagonists, there did not seem to be a slower pace in which the other rules were being acquired. Children from all participating groups followed similar courses in how they referred to the two protagonists, with comparable developmental features and comparable cognitive strategies in their performances.

6 TEMPORALITY

6.1 INTRODUCTION

For the analysis of reference to time, the focus of this chapter is on differences and similarities between Moroccan Arabic and Dutch with regard to the use of specific temporal features. We explored if these differences resulted in differences in reference to time between the bilingual Moroccan core group and the monolingual Moroccan control group on the one hand, and between the bilingual Moroccan core group and the monolingual Dutch control group on the other.

Temporal relations refer to the anchoring of events to a given reference time. *Tense oppositions* in narratives not only function to locate events relative to the moment of speech, but also as organizers of narrative structure. *Aspectual markers* create the possibility of giving additional meaning to the action or situation expressed by the verb. Some languages make use of both tense and aspect, some only have the means to differentiate between different tenses, and some almost uniquely use aspectual markers to express what the relationship between the verb in question and the rest of the utterance is. Another common device for expressing temporal relations within and between sentences is the use of *temporal adverbials*. In most languages, this is a productive linguistic device, used from a very young age onwards. The focus of this chapter is on these three aspects of temporal reference:

- tense
- aspect
- temporal adverbials

The degree of linguistic and cognitive complexity of these three aspects is not the same across languages. With respect to the acquisition of linguistic means for temporal reference, we can expect two universal principles to account for the (lack of) complex temporal features in the language use of early learners. The first principle, called the *principle of chronological order* (Klein, 1994:45), states that if there are two subsequent related events, the reference to the earlier event is made first, i.e., the order of mentioned events corresponds with their order of occurrence. This means that, in the process of acquisition, learners of a language

tend to state events in a chronological order, with no complex conjunction necessary. Learners will therefore prefer sequence (1) to sequence (2):

(1) The frog was in the jar. The boy forgot to close the jar. The frog got out off the jar.

(2) The frog was in the jar. He got out off the jar because the boy forgot to close the jar.

The second principle concerns *derivational simplicity*. We presuppose that language learners always prefer simplicity to complexity. This means that juxtaposition of two main clauses will be preferred to complex right-branching constructions, and even more to complex left-branching constructions. This means that learners will prefer utterance (3) to utterance (4), and utterance (4) to utterance (5):

(3) He saw that the frog had gone *and* started to look for it.

(4) He saw that the frog had gone. *Then* he started to look for it.

(5) *After* he saw that the frog had gone, he started to look for it

Apart from these two possibly universal principles, there are language-specific aspects that played a role in the acquisition and use by our informants of temporal features. We first looked into the major differences between Moroccan Arabic and Dutch with respect to the use of temporal features. For both languages, we focused on a description of the use of tense and aspect. As the use of temporal adverbials is common to most languages, we will not devote a section to the description of what adverbials can be found in Moroccan Arabic and Dutch. We will see in Section 6.6.3 what adverbials the informants used throughout their retellings of the *frog story* and what the differences are between bilinguals and monolinguals. We will, however, go into a description of the tense and aspect systems of both Moroccan Arabic and Dutch (below), because they differ a lot from each other. In Section 6.6, we will see how the informants made use of the tense and aspect devices that were at their disposal in the two languages and how they made use of temporal adverbials.

6.2 RESEARCH QUESTIONS

In narratives, devices for anchoring tense and specifying aspectual features are almost always used. The extent to which this happens and the way in which it happens differs for each language user and each language. In the case of a retelling, as was done by our informants with the *frog story*, the story-tellers are

obliged to connect different actions and situations that are presented in the pictures. They have all kinds of means at their disposal, as we have seen in the previous chapter(s). In order to make an analysis of temporality markers in Moroccan Arabic and Dutch the following questions are raised:

- Are there any differences between the bilingual and monolingual children regarding the *anchor tenses* they use? And are there any developmental patterns to be observed?

- Are there any differences between the bilingual and monolingual children regarding the *aspectual markers* they use? And are there any developmental patterns to be observed?

- Are there any differences between the bilingual and monolingual children regarding the *temporal adverbials* they use? And are there any developmental patterns to be observed?

- Are there any *universal developmental strategies* and/or *language-specific strategies* that the children use? Can any influences of *transfer* be found?

On the basis of previous work on the acquisition of temporality by language learners (cf. Von Stutterheim 1986, Behrens 1993, Klein 1994), we formulate the following hypotheses with regard to these questions:

- Monolingual children will acquire a consistent system of different tense markers at an earlier age than bilingual children.

- Young learners will place stories in the here-and-now, using the non-completed form in Moroccan Arabic or present tense in Dutch as the anchor of their retellings, whereas older learners will use the completed form in Moroccan Arabic or past tense in Dutch.

- Monolingual children will acquire an elaborate system of different aspectual markers at an earlier age than bilingual children.

- Young learners will overgeneralize the progressive use of aspect, whereas older learners will differentiate between the different devices available in the language.

- Monolingual children will acquire an elaborate system of different temporal adverbials at an earlier age than bilingual children.

- All learners will adhere to the principle of chronological order, which is seen as a universal strategy. Therefore there will be more occurrences of sentence-initial 'after' than of 'before'.

- Young learners will not use many complex adverbials that require a violation of the principle of derivational simplicity. This means that, in their retellings, there will be no adverbials that require, for example, a different word order than the basic one. Older learners will start to use such complex adverbials.

6.3 MOROCCAN ARABIC

6.3.1 Tense

In Moroccan Arabic there are no clear tense markers, while there are many aspect markers. Instead of referring to past or present, the different forms of the verb in Moroccan Arabic refer to the incompletion or completion of an action or a situation. Incompleteness and completeness often refer to present and past, respectively, but *not* necessarily so. Four verb forms can be distinguished (cf. Caubet, 1993a:31ff). Different kinds of combinations of these forms are also possible, which will be specified in Section 6.2.2. The four forms in question are:

- *prefixed form* (used in marked cases);
- *particle ka-* (or *ta-*) + *prefixed form* (usually denoting incompleted action/situation);
- *suffixed form* (usually denoting completed action/situation);
- *active participle* (usually denoting incompleted action/situation, but denoting completed action/situation if occurring in combination with a suffixed form).

The concepts *prefixed* and *suffixed* concern the conjugation of verbs for person. For the first form, the stem of the verb gets conjugated for the different persons by means of prefixations of phonemes (with an additional suffix for the second person feminine). For the second form, the same conjugation is used, but with an additional prefixation of a particle, which is either *ka-* or *ta-*, dependent on regional varieties.[1] The suffixed form is conjugated by means of suffixation of phonemes to the verb stem. For the active participle, there is one form for feminine and one for masculine. We do not go into plural here. The way verb forms are conjugated for plural is analogous to the way for singular described above.

[1] From this point on we will refer to this prefixation only by *ka-*, but this should always be read as *ka-* or *ta-*.

We give an example of what the singular forms look like in the different conjugations by using the verb stem *šreb* ('to drink'). This verb stem is in reality the third person masculine singular of the suffixed form. This third person masculine singular is always taken as the 'default' form in grammar books of Arabic and we will adhere to this same principle here. The active participle has two forms in the singular: one for masculine and one for feminine. The meaning is comparable to that of the *-ing* form in English.

person	***prefixed form***	***ka+prefixed form***	***suffixed form***	***active participle***
1	*ne-šreb*	*ka-ne-šreb*	*šreb-t*	fem: *šarba*
2F	*t-šerb-i*	*ka-t-šerb-i*	*šreb-ti*	masc: *šâreb*
2M	*te-šreb*	*ka-te-šreb*	*šreb-t(i)*	
3F	*te-šreb*	*ka-te-šreb*	*šerb-at*	
3M	*ye-šreb*	*ka-ye-šreb*	*šreb-ø*	

One aspect that should be mentioned here is direct speech. *Direct speech* is a linguistic means to make a retelling more vivid. It is mostly used by the older children. In direct speech, the present tense is the most frequent tense, which makes it possible for the informant to alternate between two tenses (past tense for the retelling and present tense for direct speech within the retelling). Direct speech is not included in our analysis because there were not that many occurrences (see Section 5.3: 'data analysis'). One example will be given here:

(6) *u dak l-wliyyed bqa ta-yšuf fe-h. qal l-u: "ža-n-i daba n-nɛes". u nɛes mɛa l-kelb dyal-u. u gal kikker* (= Dutch for frog): *"ɛlaš ma-ydiru l-i-š l-ma? daba nehreb ɛend mama u baba". u mnin bġa dak l-wliyyed yhezz kikker* (= Dutch for frog) *ma-šafu-h-š. u mša hreb.*
and that boy started to look at him. he said to him: "now I am sleepy". and he slept with his dog. and Frog said: "why don't they put water for me? I will flee to mommy and daddy now". and when that boy wanted to get Frog, they did not see him. and he had fled.
(Rajae, bilingual Moroccan girl, 10 years old, in Moroccan Arabic)

The use of direct speech, of course, is not specific to Moroccan Arabic, but is a device that can be used in virtually any language, including Dutch. It is also much more a person-specific characteristic than a language-dependent or age-dependent factor.

6.3.2 Aspect

In this section, we will describe for what kind of meanings the four forms presented earlier (and their combinations) are used. We will give examples in all

categories to give the reader an idea of what different aspects can be addressed by a speaker of Moroccan Arabic.

As mentioned before, the *prefixed form* is used in very specific cases, as in proverbs, eventualities, vague future, orders or wishes and optatives. In such cases, the prefixed form usually refers to an incompleted action or situation, either concomitant or non-concomitant. It can also be used in combination with other verb forms in order to refer to modality, and in combination with different particles, denoting unmarked future and near future. All examples in this chapter either originate from Caubet (1993b:156-252) or from the present data-base:

in proverbs:

(7) *lli ḍerbat-u yedd-u ma-**yebki**.*
he, who his -own- hand hits him, does not cry.
(= he who makes mistakes should bear the consequences)

potentiality, eventuality:

(8) *galet l-ha "la, ṣ-ṣultan **yqeṭṭeϵ** l-i ras-i".*
she said to her: "no the sultan would cut my head off".

vague future:

(9) ***nebni** l-ek dukkana.*
I will build you a terrace.

order or wish:

(10) *yallah **nqellbu** ϵli-h, yallah.*
come on, let's go look for him, come on.
(Samir, bilingual Moroccan boy, 7 years old, in Moroccan Arabic)

optative:

(11) *rasu l-ϵdu **yetdegdeg**.*
may the enemy's head be broken.

(12) *llah **yeϵṭi**-k ṣ-ṣeḥḥa.*
may God give you health.

construction with dependence on another verb:

(13) *u hadak kikker* (= Dutch for frog) ***bġa yexrej** men dik l-pot* (= Dutch for jar).
and that frog wanted to get out of the jar.
(Hakima, bilingual Moroccan girl, 7 years old, in Moroccan Arabic)

circumstantial sentences (with *u* 'and', *waxxa* 'although', *mnin* 'when' etc.):

(14) *mnin **yži** gul-ha l-i.*
when he arrives, tell me.

unmarked future; construction with the *ġadi* (particle indicating future reference):

(15) *ġadi* ***tebki***.
she will cry.

near future; construction with the adverb *daba* ('now'):

(16) *daba* ***yži***.
he comes now (= he can be here any minute).

The combination of the particle *ka-* + *prefixed form* almost always refers to the incompleted action, either concomitant (comparable to the durative or progressive) or non-concomitant. For verbs of motion *ka-* + *prefixed form* is always non-concomitant. This form can also refer to aspects such as habitual, iterative, aorist and general truth. We give several examples here of the use of this verb form:

incompleted action, concomitant:

(17) *u l-kelb u l-weld* ***ka-yšufu*** *l-kikker* (= Dutch for frog).
and the dog and the boy are looking at the frog.
(Mohammed, bilingual Moroccan boy, 7 years old, in Moroccan Arabic)

incompleted action, non-concomitant:

(18) *ma-kunti-š* ***ka-tsemɛi*** *ši ḥaža ɛal l-maġreb?*
have you never heard talking about Morocco?

habitual:

(19) ***ka-tži*** *l-fas bezzaf.*
she goes to Fez a lot.

iterative:

(20) *ɛad* ***ka-yfettšiw*** *u* ***ka-yfettšiw*** *u* ***ka-yfettšiw***.
and they are looking and looking and looking.
(Iliass, bilingual Moroccan boy, 7 years old, in Moroccan Arabic)

aorist:

(21) *dak l-ɛayel* ***ka-yeɛref*** *yɛum.*
that boy can swim.
(Mariam, bilingual Moroccan girl, 9 years old, in Moroccan Arabic)

general truth:

(22) *l-ma* ***ka-yeġli*** *f-myat daraža.*
water boils at 100 degrees.

The *suffixed form* of the verb is commonly used for completed actions or situations that are non-concomitant, but also sometimes for completed actions that

are concomitant. Other uses are pseudo-performatives, hypothetical clauses, concessive clauses, circumstantial clauses, and perfect. Examples are given here:

completed action or situation (non-concomitant):
(23) *u l-grana* ***herbat*** *l-u.*
and the frog fled (from) him.
(Iliass, bilingual Moroccan boy, 7 years old, in Moroccan Arabic)

completed action or situation (concomitant) / performative:
(24) ***qbelt.***
I accept.

pseudo-performative:
(25) ***ɛrefti*** *ɛlash?*
do you know why?

hypothetical clause:
(26) *l-ɛarbiya, ila ma* ***tɛellemti****-ha-š, ma-yemken le-k teqra-ha.*
(as for) Arabic, if you don't learn it, you cannot read it.

concessive clause:
(27) *škun ma* ***ža*** *gul l-u xrežt.*
who ever may come, tell him I left.

circumstantial clause:
(28) *menni* ***nad*** *fe-ṣ-ṣbaḥ šnu šaf?*
when he woke up in the morning, what did he see?
(Iliass, bilingual Moroccan boy, 7 years old, in Moroccan Arabic)

perfect (with or without the particle *ha* or *ra-*; see Section 6.6.3.1):
(29) *ha huwa* ***ža****.*
he has arrived.

perfect (with a form of *kan* = suffixed form of 'to be'):
(30) *škun lli kan* ***šra****-h u* ***žab****-u l-na?*
who is it that has bought this and brought it to us?

The *active participle*, finally, can be used as perfect/completed action or situation (concomitant), as actual/incompleted action or situation (concomitant), as aorist, as prospective (incompleted action, concomitant) and as past durative. Examples are:

perfect:

(31) *ana* ***daaaayez*** (+ superiority in intonation) *men had ṭ-ṭriq.*
I have alredy passed this road (implicit meaning: ages ago).

actual:

(32) *u hadak ž-žru* ***gâles*** *fe-dik kapotte boom* (= broken tree in Dutch).
and that dog is sitting on that broken tree.
(Hakima, bilingual Moroccan girl, 7 years old, in Moroccan Arabic)

aorist:

(33) ***kayna*** *hadi wella ma-****kayna****-š?*
does this exist or does it not?

prospective:

(34) *ġedda ana* ***ṭalɛa*** *l-"la ville".*
tomorrow I'm going -up- to the city.

past durative:

(35) *hadak ž-žru* ***kan*** *eh* ***wâqef*** *fe-hadak s-stenen* (= stones in Dutch).
that dog was er standing on those stones.
(Hakima, bilingual Moroccan girl, 7 years old, in Moroccan Arabic)

6.4 DUTCH

6.4.1 Tense

Whereas in Moroccan Arabic there are no clear tense markers and many aspect markers, Dutch shows the reverse picture: there are no clear aspect markers in Dutch morphology and many tense markers. This does not mean that there are no means in Dutch to link aspectual features to an action or situation, but they are not expressed by the verb form itself (see Section 6.3.2). The different categories for the different tenses are as follows:

present:	simple present	**past**:	simple past
	present perfect		past perfect

The perfect tenses are created by the combination of an auxiliary (either *hebben*, 'to have' or *zijn*, 'to be'), either in the present or in the past tense, plus the past participle. To give the reader an idea, the forms for the singular are presented here. The infinitive is *drinken* ('to drink') and the verb stem is *drink*. The conjugation in other tenses than simple present is a so-called 'strong' one, which means that a vowel change takes place (in this case i → o):

person	*simple present*	*present perfect*	*simple past*	*past perfect*
1	*drink*	*heb gedronken*	*dronk*	*had gedronken*
2	*drinkt*	*hebt gedronken*	*dronk*	*had gedronken*
3F	*drinkt*	*heeft gedronken*	*dronk*	*had gedronken*
3M	*drinkt*	*heeft gedronken*	*dronk*	*had gedronken*

Examples of the four different tenses originate from our data-set:

simple present:
(36) *de jongen **zit** en de kikker **kijkt**.*
the boy sits and the frog looks.
(Samir, bilingual Moroccan boy, 5 years old, in Dutch)

simple past:
(37) *de jongen **fluisterde** tegen zijn hond "ssst".*
the boy whispered to his dog "ssssh".
(Ghariba, bilingual Moroccan girl, 9 years old, in Dutch)

present perfect:
(38) *en die ene jongen **is gevallen**.*
and that one boy has fallen.
(Oussama, bilingual Moroccan boy, 5 years old, in Dutch)

past perfect:
(39) *toen **was** de kikker **weggelopen**.*
then the frog had run away.
(Mariam, bilingual Moroccan girl, 9 years old, in Dutch)

Some of our informants expressed *foregrounding* and *backgrounding* by alternating tenses. This means that one tense is used for the actual retelling of the actions and the other tense is used to describe background information. In our database we found actual retellings in the present tense and background information in the past tense:

(40) *en de hert gaat op een eh ja soort eh rots staan. en dan eh laat ie opeens het kindje vallen in de sloot. en dan zijn ze allebei nat. en eh de sloot **was** gelukkig niet eh diep. hij **was** ondiep. en eh het hondje is gauw op eh hem eh hoofd gaan zitten want hij **was** een beetje bang. en dan loopt ie verder in het water.*

and the deer goes to stand on a er yeah sort of er rock. and then er all of a sudden he lets the child fall in the ditch. and then they are both wet. and fortunately er the ditch was not er deep. it was shallow. and er the doggie quickly went to sit on him er head because he was a bit afraid. and then he walks on in the water.
(Noortje, monolingual Dutch girl, 9 years old, in Dutch)

This phenomenon only occurred in the data of our 9- and 10-year-olds and not in the retellings of the younger children. In this matter there was also strong variation between our informants. Some children elaborated extensively on background information at a relatively young age, while others at the age of 10 described only the actions that took place in the *frog story* with no or hardly any scene setting at all. Most of the youngest children either stuck to one tense throughout the retelling or they seemed to alternate between tenses without a clear motivation.

6.4.2 Aspect

Aspectual markers in Dutch are realised through the use of modal verbs, the use of compound verbs and prepositions: *ik ben aan het lopen* (I am on the walk = 'I am walking'), *ik ga lopen* (I go walk, 'I am going to walk'), *ik begin alvast te lopen* (I start already to walk = 'I'm going ahead, you catch up with me'), etc. Examples from our data-set are the following:

present progressive: *aan het* (="-ing") + infinitive / *zit te* (= sits to) + infinitive / *loopt te* (=walks to) + infinitive:

(41) *die hondje **zit te waffen** tegen die bijen.*
that dog sits to woof (= is barking) to the bees.
(Kees, monolingual Dutch boy, 7 years old, in Dutch)

(42) *het jongetje **is** weer **aan het roepen**.*
the boy is calling again.
(Lisanne, monolingual Dutch girl, 7 years old, in Dutch)

past progressive: *aan het* (="-ing") + infinitive / *zat te* (= sat to) + infinitive / *liep te* (=walked to) + infinitive:

(43) *toen **liep** tie maar steeds **te zoeken** bij zijn laarzen.*
then he walked constantly to search (= was constantly searching) near his boots.
(Rajae, billingual Moroccan girl, 9 years old, in Dutch)

present inchoative: *gaat* (=goes to) + infinitive / *begint te* (=begins to) + infinitive:

(44) *dus de jongen **gaat** hard **wegrennen**.*
so the boy goes to run away (= starts to run away) fast.
(Khaled, bilingual Moroccan boy, 9 years old, in Dutch)

past inchoative: *ging* (=went) + infinitive / *begon te* (=began to) + infinitive:

(45) *toen **ging** die hond hem **roepen**.*
then went that dog to call (= started to call) him.
(Hassna, bilingual Moroccan girl, 5 years old, in Dutch)

present modal:

(46) *en de hond **wil** naar de honingkorf.*
and the dog wants (to go) to the honeyhive.
(Ron, monolingual Dutch boy, 7 years old, in Dutch)

past modal:

(47) *en d'r was er één heel kleintje. en die **kon** er niet **opkomen**.*
and there was one very little one. and that one couldn't get on top of it.
(Wanda, monolingual Dutch girl, 7 years old, in Dutch)

There are examples of present future in our data as well, but only in direct speech. For the sake of completeness we present an example of this as well, although direct speech was not included in our analyses. Examples of past future (usually in conditional clauses) did not occur in our data-set.

present future:

(48) *"nee &z het zullen ze niet **zijn**".*
"no it will not be them".
(Kelly, monolingual Dutch girl, 9 years old, in Dutch)

6.5 DATA COLLECTION, PROCESSING AND ANALYSIS

The data that will be presented in this chapter are derived from an analysis of retellings of the picturebook "Frog, where are you?" (Mayer 1969). We do not need to say much about the data collection here, because we used the same data-set as in Chapters 3, 4, and 5. The only difference is that for this set of analyses a subset of the available data was used, because the way in which we looked into this domain of analysis was very time-consuming.

As monolingual data of the children in Morocco were available for the ages of 5, 7 and 9, we decided to make this same age selection for the bilingual Moroccan group and the monolingual Dutch control group. This presented us with a data-set of almost 300 transcripts (see Table 6.1). All utterances were studied for anchor tense, aspectual features, and temporal adverbials. An overview of the results will be presented in Sections 6.6.1 through 6.6.3.

Table 6.1 Number of transcripts involved in the analysis of temporality in Moroccan Arabic and Dutch

Language	*Moroccan Arabic*			*Dutch*		
Group ***Age***	5	7	9	5	7	9
Core group of bilinguals	25	25	25	25	25	25
Moroccan control group	24	24	23	-	-	-
Dutch control group	-	-	-	25	25	25
Total	49	49	48	50	50	50

6.6 RESULTS

For each group of informants, we first looked at the anchor time involved, then at aspectual features and concluded with temporal adverbials and particles. In the previous chapters, we have made an analytical division into sections on the basis of bilingualism and monolingualism. In this chapter, we have opted for a division on the basis of language. As there are many differences between Moroccan Arabic and Dutch with regards to temporality, a division on the basis of being part of the core group or part of a control group did not serve our purpose.

6.6.1 Anchor time

We will first look at the *anchor time* in the retellings of the children, taking this as a starting point for comparison. In Section 6.6.1.1, we will look at the Moroccan Arabic transcripts of the bilingual children aged 5, 7 and 9 and subsequently at the Moroccan Arabic transcripts of the monolingual Moroccan children. We will go into the Dutch transcripts of the bilingual children aged 5, 7 and 9 and the Dutch transcripts of the monolingual Dutch children in Section 6.6.1.2.

Anchor time refers to the general tense pattern of the retellings. Most children adhere to the use of one tense for the whole retelling. For Moroccan Arabic, we looked at forms that either referred to completed actions or situations or forms that referred to incompleted actions or situations. We called these forms the *accompli* and the *inaccompli* respectively, copying the French terminology used by Caubet (1993b). For Dutch we looked at the past and the present tense forms used in the retellings.

For Moroccan Arabic we decided that if over 80% of the utterances made by an informant was made with the use of forms that referred to completed actions or situations, the anchor time was called *accompli*. And conversely, if over 80% of the utterances was made by means of forms that referred to incompleted actions or situations, the anchor time was registered as *inaccompli*. If percentages were below 80%, the retelling was put under 'mix.' Of course, we used the same criteria for Dutch in order to interpret the anchor time of a retelling as either 'past', 'present' or 'mix.'

6.6.1.1 Moroccan Arabic

For Moroccan Arabic, the transcripts of the bilingual core group and the Moroccan monolingual control group were taken into account. The anchor time was established on the basis of the above-mentioned 80% criterion. The outcome is shown in Table 6.2 on the following page.

Table 6.2 Anchor time in Moroccan Arabic (N=25)

	Bilingual core group			*Monolingual control group*		
Age	*Inaccompli*	*Accompli*	*Mix*	*Inaccompli*	*Accompli*	*Mix*
5	1	6	18	4	3	17
7	-	5	20	-	12	12
9	-	17	8	-	14	9

There were hardly any children that used only the *inaccompli* as the basic anchor time for their retellings. Only among the 5-year-olds in the bilingual group was this done by 1 child and in the monolingual group by 4 children. We then observe that the 9-year-olds all ended up with most stories having *accompli* as the anchor time, but for the monolingual children this trend seemed to start slightly earlier than for the bilinguals. The bilinguals adhered to mixed retellings longer than the monolinguals.

6.6.1.2 Dutch

In Table 6.3 the results are shown in Dutch for the bilingual and the monolingual children.

Table 6.3 Anchor time in Dutch (N=25)

	Bilingual core group			*Monolingual control group*		
Age	*Present*	*Past*	*Mix*	*Present*	*Past*	*Mix*
5	9	5	11	14	4	7
7	7	6	12	17	5	3
9	3	20	2	9	15	1

If we compare the Moroccan Arabic *accompli* with the Dutch past tense, we can say the same about Dutch as we did for Moroccan Arabic. Both groups of informants ended up with past tense reference as anchor time. But here the monolinguals made much more use of the present tense, whereas the bilingual children had more mixed retellings.

6.6.2 Aspectual features

6.6.2.1 Moroccan Arabic

We have put all occurring verb forms of the retellings in Table 6.4. The classification presented was made on the basis of verb forms. We have seen in Section 6.2.2 that many functions can be attributed to the different verbs, depending on the context of the sentence. It is impossible to determine the function of each verb form, because this would mean going over almost 6,000 verb forms with a group of native speakers to determine the exact aspect of the verb. This may be an enterprise for a follow-up study, but cannot be dealt with in the context of this chapter (see Section 7.5, "Perspective"). We decided to make a division of prefixed, *ka*+prefixed and suffixed forms and then to attach a specific, *inaccompli* and *accompli* aspect to them respectively. The same holds for active participle (inaccompli) and suffixed form + active participle (accompli). For the modal verbs, we also had as a basis suffixed form (accompli), prefixed form (inaccompli) and *ġadi* (future particle).

Table 6.4 Verb forms in Moroccan Arabic retellings (N=25)

	Bilingual core group			***Monolingual control group***		
Age	5	7	9	5	7	9
"Tense"						
prefixed	35	16	16	70	47	44
ka+prefixed	267	218	62	193	136	108
suffixed(+ka+prefixed)	660	538	741	427	579	629
Active participles						
active participle	52	26	16	87	66	53
suffixed+active participle	6	6	8	16	33	36
Modality						
suffixed+(ka+)prefixed	40	28	54	117	139	186
prefixed+(ka+)prefixed	3	3	-	15	18	8
ġadi+(ka+)prefixed	9	2	-	13	5	6
Total	1072	837	897	938	1023	1070

From Table 6.4, we can see that the monolingual children made more use of the verb forms that have a specific aspectual meaning (bare prefixed form) than the bilingual children. The bilingual children mostly used the *ka*+prefixed form or the suffixed form (with or without the combination with a prefixed form). For the active participle the same can be said. It has certain special functions that cannot always be expressed by the prefixed or suffixed form and can therefore be an important device for narrators. The monolingual children made much more use of it (either in a bare form or in combination with a suffixed form) than the bilingual children did. The same can also be said for the use of modal verbs,

whether in combination with a prefixed form, a suffixed form or the future particle: the monolinguals used them much more often than the bilinguals.

6.6.2.2 Dutch

For Dutch we have constructed a similar table as we did in Section 6.6.2.1 for Moroccan Arabic, in which the different tenses of the verb forms are presented.

Table 6.5 Verb forms in Dutch retellings (N=25)

	Bilingual core group			***Monolingual control group***		
Age	5	7	9	5	7	9
Tense						
present	365	370	128	513	662	296
past	163	257	613	221	250	447
present perfect	64	38	21	16	21	15
past perfect	44	54	46	18	26	34
"Aspect"						
aan het / present	12	14	2	11	20	6
aan het / past	5	2	6	8	3	14
gaan / present	112	34	7	81	45	21
gaan / past	172	202	161	35	45	89
Modality						
present	14	13	2	18	22	7
past	8	12	28	11	11	28
Total	959	996	1014	932	1105	957

Although there is no real aspect in Dutch, it is possible to attach aspectual meanings to verb forms with the aid of devices such as those mentioned in Section 6.4.2. Other ways of expressing, for example, a durative action, emerged, such as those in examples (49) and (50):

(49) *toen gingen ze **zoeken zoeken zoeken zoeken**.*
then they went to search search search search.
(Iliass, bilingual Moroccan boy, 7 years old, in Dutch)

(50) *toen ging ie **roepen roepen**.*
then he went to call call.
(Iliass, bilingual Moroccan boy, 7 years old, in Dutch)

We have, however, limited ourselves in Table 6.5 to the verb forms discussed in Section 6.4.2, including also tense and modality, just as in the previous section. We see that for the so-called aspectual markers there was a clear difference between past en present references. The same holds for the modal forms: over time, there was a decrease of present and an increase of past tense reference.

There was not such a great difference between the monolingual and the bilingual informants. For the basic forms the same can be said, although the bilinguals made more use of the past than the monolinguals, who made relatively more use of the present tense as anchor time.

The table also shows that the bilingual children made much more use of *gaan*-present(+infinitive) or *gaan*-past(+infinitive) than the monolingual children. It is not clear if these occurrences should be seen as an expression of inchoative aspect. For instance, the same 'overuse' has been observed by De Ruiter (1989) and he made the very plausible suggestion that this might be a strategy to avoid derivations of the main verb.

6.6.3 Temporal adverbials

Temporal adverbials are used to link sentences together temporally, or to make a temporal link within one sentence. Some of them are widely used in story telling, others are more complicated and therefore less used. For instance, the word combination 'and then' at the beginning of a sentence can be used to connect a whole series of sentences, provided they are told in a chronological way.

By means of the available computer program, we sampled out all the sentences that contained a temporal adverbial or a temporal conjunction. The only temporal adverbials found in the texts were either positional adverbials, indicating that the action took place *after* or *at* the moment of speech ('and then,' 'thereafter,' 'now'), or contrastive adverbials (such as 'not yet,' 'still,' 'just'). No instances of positional adverbials referring to an action *before* the moment of speech ('before') were used by our informants, nor frequentative adverbials ('always,' 'never,' 'often'), nor durational adverbials ('until,' 'in,' 'during') (cf. for an elaborate description of categories: Starren 1996).

6.6.3.1 Moroccan Arabic

As there were no durative or frequentative temporal adverbials in our data-set, we singled out all occurrences of positional and contrastive temporal adverbials. These are presented in Table 6.6.

We see that there were quite some differences between the bilingual group and the monolingual group. We will discuss them one by one. The temporal device *men beɛd* ('after that' / 'and then') was hardly used by the bilingual group. The monolingual group used this device much more frequently, but not to an extent that it could be seen as their basic connector for a retelling with a chronological order. The bilingual children used all kinds of variants of *saɛ-* (intranslatable particle, most probably related to *saɛa*: 'hour,' 'moment in time') for this purpose, like *saɛtek, saɛantek, saɛanti,* etc. Of these words, most variants could not be identified by native adult speakers of Moroccan Arabic. The monolingual children also used these forms, but to a much smaller extent. In the

data-set of the bilingual children, there are frog stories in which each sentence starts with a variant of *saϵ*. For the monolingual data-set this is not the case.

Table 6.6 Occurrences of temporal adverbials in Moroccan Arabic transcripts (N=25)

	Bilingual core group			***Monolingual control group***		
Age	5	7	9	5	7	9
positional						
(men) beɛd	1	-	14	20	2	15
saɛ-	142	81	62	5	63	14
ha	17	2	3	92	238	47
ra	-	-	3	42	48	7
iwa	-	1	37	53	19	27
ɛawed	54	25	10	-	-	-
ɛad	77	41	24	-	-	-
contrastive						
ma-zal	-	-	-	3	1	2
baqi	1	7	2	1	1	3
ɛawed	-	-	-	6	2	5
ɛad	-	-	-	2	6	1

In the monolingual data-set, we found another particle that fulfilled the role of much used chronology marker, i.e., *ha*. The particle *ha* (as well as the particle *ra-*), however, indicates that the moment of speech and the topic time coincide (cf. Caubet, 1994b). This is in contrast to *saϵ*, which puts the topic time before the moment of speech. We present a few examples of utterances with these adverbials:

(51) *men beɛd [/]* ***men beɛd*** *dik ž-žru ṭaḥ. u* ***men beɛd*** *therrsat l-u [//] herrsat l-u ž-žaža dyal-u. u* ***men beɛd*** *dik l-ϵayel qebṭ-u.*
then [/] then that dog fell. and then his glass had broken him [//] broken him. and then that boy grabbed him.
(Siham, bilingual Moroccan girl, 9 years old, in Moroccan Arabic)

(52) ***u saϵtek*** *ž-žru ka-yetϵelleq fe-š-šežra.* ***u saϵtek*** *n-nḥel xeržu.* ***u saϵtek*** *eh herbu.*
and then the dog was hanging in the tree. and then the bees came out. and then er they fled.
(Ouidan, bilingual Moroccan boy, 9 years old, in Moroccan Arabic)

(53) *l-weld* ***ha huwa*** *nϵes. l-kelb* ***ha huwa*** *fuq-u.*
the boy(, there he) is sleeping. the dog(, there he) is on top of him.
(Sami, monolingual Moroccan boy, 5 years old, in Moroccan Arabic)

The 9-year-old bilinguals started to use *iwa* ('thus') as a connector, whereas the younger bilingual children did not use this device at all. The monolingual children used it from a young age onwards:

(54) ***iwa u*** *bqa yġuwwet.* ***iwa u*** *ṭaḥu huwa u kelb-u.* ***iwa u*** *had l-ġzala ṭeyyḥat-hum.* ***iwa u*** *ṭaḥu fe-l-ma u ġerqu.*
well, and he started to scream. well, and they fell, he and his dog. well, and this deer made them fall. well, and they fell into the water and drowned.
(Amina, monolingual Moroccan girl, 5 years old, in Moroccan Arabic)

We found that contrastive temporal adverbials, such as *ma-zal* ('still'), *baqi* ('yet'), *ϵawed* ('again') and *ϵad* ('just') are less used by the bilinguals than by the monolinguals. Examples are:

(55) *u lqa* ***ϵawed*** *waḥed axur.*
and again he found another one.
(Ahlam, monolingual Moroccan girl, 5 years old, in Moroccan Arabic)

(56) *ha huwa* ***ϵad*** *ṭaleϵ.*
here he is just (starting to) climb up.
(Kawtar, monolingual Moroccan girl, 7 years old, in Moroccan Arabic)

For the bilinguals, we see an overgeneralized use of *ϵad* and *ϵawed*. These words, which usually mean 'just' and 'again' respectively, seem to be used by the bilinguals as a sort of chronological marker, as in: '*and then* this happened, *and then* that' (identified by Caubet as markers in retellings: "série d'événements à l'aoriste du récit," 1994a:177). This is why we put *ϵad* and *ϵawed* under "contrastive" for the monolinguals, but under "positional" for the bilinguals because that is the function they seemed to give to these words. This holds to a lesser degree for *ϵawed* than for *ϵad*. Especially the 9-year-old bilinguals seemed to start to use *ϵawed* in the same way as the monolinguals do. Here, too, we present some examples:

(57) ***u ϵad*** *xelliw š-šeržem meḥlul.* ***ϵad*** *ka-yfettšiw u ka-yfettšiw u ka-yfettšiw.* ***u ϵad*** *huma ma-žebru-ha-ši.*
and then they left the window open. then they were looking and looking and looking. and then they did not find her.
(Iliass, bilingual Moroccan boy, 7 years old, in Moroccan Arabic)

(58) ***ϵawed*** *waḥed l-meϵza hezzat-u.* ***ϵawed*** *bqat [///] kanet [///] &kat bġat ṭeyyḥ-u fe-l-ma.* ***u ϵawed*** *ṭaḥ.* ***ϵawed*** *lqaw hadik kikker* (= Dutch for frog).

then a goat picked him up. then she started [//] went [//] &to wanted to make him fall into the water. and then he fell. then they found that frog.
(Bilal, bilingual Moroccan boy, 7 years old, in Moroccan Arabic)

The adverbials mentioned in the above section can all be used at the beginning of a simple clause. If we look at conjunctions that cause the use of *subordinate* clauses (*ḥiṭ, mḥiṭ, li'anna, (ɛla) ḥeqqaš*: 'because', *baš*: 'in order to'), we see that such conjunctions were less used by the bilinguals than by the monolinguals, and this goes especially for *baš*:

Table 6.7 Occurrences of conjunctions that cause subordinate clauses in Moroccan Arabic transcripts (N=25)

	Bilingual core group			***Monolingual control group***		
Age	5	7	9	5	7	9
ḥiṭ	-	-	-	-	-	4
mḥiṭ	1	-	-	-	-	-
li'anna	-	-	-	1	-	-
(ɛla) ḥeqqaš	-	-	-	-	2	-
baš	5	1	6	19	16	14

Example:

(59) *u l-kelb bġa yeṭleɛ* ***mḥiṭ*** *xaf men hadik eh eh l-far.*
and the dog wanted to climb because he was afraid of that er er mouse.
(Nahid, bilingual Moroccan girl, 5 years old, in Moroccan Arabic)

There is another group of temporal markers that we can take into consideration. These are markers of *simultaneity* (*melli, menni, mnin*: 'while', 'when'). They require coordination of clauses.

Table 6.8 Occurrences of markers of simultaneity in Moroccan Arabic transcripts (N=25)

	Bilingual core group			***Monolingual control group***		
Age	5	7	9	5	7	9
melli	1	-	6	5	13	6
menni	-	1	-	-	-	2
mnin	2	-	-	-	2	14

Markers of simultaneity are also made more use of by monolingual children than bilingual children. The monolingual data-set contains 42 occurrences of markers of simultaneity as opposed to 10 in the bilingual data-set. Examples:

(60) *u **mnin** faqu ṭellu ϵla l-bwaṭa lli kanet fe-ha ž-žrana.*
and when they woke up, they looked at the box in which the frog had been.
(Youssouf, monolingual Moroccan boy, 9 years old, in Moroccan Arabic)

(61) ***mnin** naḍu ma-lqaw-š ḍ-ḍefḍaϵa.*
when they got up they did not find the frog.
(Laila, monolingual Moroccan girl, 7 years old, in Moroccan Arabic)

(62) *ha huwa **melli** ṭaḥ ha huwa gaϵ therres hadak.*
here when he fell he completely destroyed that (=jar).
(Kawtar, monolingual Moroccan girl, 7 years old, in Moroccan Arabic)

On the whole, we can state that the monolingual informants did not use these complex markers very often, but they did use them more frequently than the bilinguals. Adults are expected to use more of these complex markers (contrastive adverbials, subordinate conjunctions, markers of simultaneity), and the observed phenomenon can be seen as a developmental feature. The bilingual children used these complex markers even less than the monolingual children, which can be seen as a consequence of the slower pace at which they seem to develop throughout the period of acquiring two languages.

6.6.3.2 Dutch

We now turn to the Dutch data-set of both the bilingual core group as well as the monolingual control group. Table 6.9 presents the occurrences of temporal adverbials in both Dutch data-sets. Also in these data-sets, we found only positional and contrastive adverbials and no durative or frequentative ones.

Table 6.9 Occurrences of temporal adverbials in Dutch transcripts (N=25)

	Bilingual core group			***Monolingual control group***		
Age	5	7	9	5	7	9
positional						
(en) toen	280	307	216	157	147	218
(en) dan	38	38	1	187	193	52
nou	5	-	-	80	22	7
daarna	-	1	1	3	8	3
contrastive						
nog	1	4	8	12	19	14
nog niet	1	-	2	1	3	1
nog steeds	-	2	3	1	11	8
bijna	10	3	1	3	2	8

were in combination with an utterance in present tense. This is 13%, as opposed to 3% in the data-set of the 5-year-old monolingual group.

Table 6.10 Occurrences of present tense plus *toen* and past tense plus *dan* in Dutch transcripts (% in parentheses) (N=25)

	Bilingual core group			***Monolingual control group***		
Age	5	7	9	5	7	9
'toen' + present	36/280 (13)	23/307 (8)	1/261 (0)	5/157 (3)	8/147 (5)	3/218 (1)
'dan' + past	12/38 (32)	4/38 (10)	0/1 (0)	6/187 (3)	4/193 (2)	3/52 (6)

We see that all the percentages of the non-standard devices *toen* + present tense and *dan* + past tense were higher for the bilinguals than for the monolinguals (apart from the 0% for 9-year-olds in *dan* + past, but there was only one occurrence), but this does not account for the great differences between *toen* and *dan* in Table 6.9. We therefore have to conclude that the bilingual children overgeneralized *toen* as a clause linker at the beginning of the sentence. It seems as if they made less use of conjunctions that require subordination than monolinguals, a strategy we also witnessed for Moroccan Arabic.

Examples:

(67) *en **toen** [/] toen trekt ie zun kleren aan en zun jas.*
and then [/] then he puts on his clothes and his coat.
(Deborah, monolingual Dutch girl, 5 years old, in Dutch)

(68) ***toen** doet ie die raam open.*
then he opens that window.
(Hassna, bilingual Moroccan girl, 7 years old, in Dutch)

(69) ***en dan** keek Jan achter de boomstam.*
and then Jan looked behind the treetrunk.
(Chet, monolingual Dutch boy, 9 years old, in Dutch)

(70) ***dan** ging tie wakker worden.*
then he went to wake up.
(Samir, bilingual Moroccan boy, 5 years old, in Dutch)

In the case of contrastive adverbials (*nog (steeds)*: 'still', *nog niet*: 'not yet', *bijna*: 'almost'), we see that also in this domain, the monolinguals made much more use of them than the bilinguals did, just as we have saw for Moroccan

Arabic. Examples are:

(71) *en eh die uil kwam* ***nog steeds*** *achter hem aan.*
and er that owl was still following him.
(Said, bilingual Moroccan boy, 9 years old, in Dutch)

(72) *en toen viel hij* ***bijna*** *om.*
and then he almost fell over.
(Yasmina, bilingual Moroccan girl, 9 years old, in Dutch)

There were many occurrences of *bijna* in the data-set of the 5-year-old bilinguals, but most of them were used with a non-standard meaning, as we can see in the following example, where the informant uses *bijna* in order to make a distinction between an action-in-progress and a completed action:

(73) *en deze is* ***bijna*** *gevallen, helemaal.*
and this one has almost fallen [=is falling], completely [has fallen].
(Oussama, Moroccan boy, 5 years old, bilingual, in Dutch)

For *conjunctions* that refer to a causal relation between clauses, the following results emerge:

Table 6.11 Occurrences of conjunctions that cause subordinate clauses in Dutch transcripts (N=25)

	Bilingual core group			***Monolingual control group***		
Age	5	7	9	5	7	9
want	4	1	6	13	16	19
omdat	-	-	3	2	-	4
dus	-	-	13	-	2	8

The coordinating device *want* ('for') requires no inversion (such as verb-subject or auxiliary-past participle, depending on the syntax of the utterance), the subordinating device *omdat* ('because') does. This difference in complexity might account for the difference between the number of occurrences of both conjunctions. *Dus* means 'therefore' or 'so'. There seems to be an overgeneralized use of *dus* for the bilingual 9-year-olds. For the rest, not many of these complex conjunctions can be found in the data-set of the bilinguals. There were more occurrences in the data-set of the monolinguals, although these numbers were not substantial either. We present some examples:

(74) *en die hond hij kan niet heel hoog springen* ***want*** *hij is nog klein.*
and that dog he cannot jump very high because he is still small.
(Hassna, bilingual Moroccan girl, 7 years old, in Dutch)

(75) *en toen viel die naar beneden* ***omdat*** *dat dier kwaad was.*
and then that one fell down because that animal was angry.
(Dimmy, monolingual Dutch boy, 5 years old, in Dutch)

Markers of *simultaneity* also occur in the Dutch data-sets, as can be seen in Table 6.12.

Table 6.12 Occurrences of markers of simultaneity in Dutch transcripts (N=25)

	Bilingual core group			***Monolingual control group***		
Age	5	7	9	5	7	9
toen...(toen)	2	1	11	1	3	7
terwijl	-	-	-	-	-	2

Most occurrences are of the kind *toen...(toen)* ('when...(then)') and there are only two occurrences of *terwijl* ('while'). There were few differences between the bilingual and monolingual group. We see that the use of these complex markers was quite rare in both data-sets. Examples are:

(76) ***toen*** *dat hert weg &ree rende hangde hij nog aan dat gewei.*
when that deer &dro ran away he was still hanging in those antlers.
(Shirley, monolingual Dutch girl, 9 years old, in Dutch)

(77) ***toen*** *hij slaapt toen ging de aap weglopen.*
when he sleeps then the monkey went to walk away.
(Iliass, bilingual Moroccan boy, 5 years old, in Dutch)

(78) *toen ging ie [//] de hond in de [/] in de pot [/] in de pot zoeken* ***terwijl*** *de jongen zich aan zit te kleden.*
then went he [//] the dog to search in the [/] in the jar [/] in the jar while the boy sits to dress himself.
(Danny, monolingual Dutch boy, 9 years old, in Dutch)

As a rule, the bilinguals made more use of temporal adverbials that are used at the beginning of simple sentences, whereas the monolinguals made more use of conjunctions that demand more complex sentences or even subordination. These results fit in with the concept of the Basic Variety, proposed by Dietrich, Klein & Noyau (1995:15), with the difference that adult L2-learners may fossilize at this point, which for young L2-learners is usually not the case.

6.7 CONCLUSIONS AND DISCUSSION

In this section we will sum up the differences and similarities found for the different developmental aspects of temporal reference. If we look at the use of tense and aspect, we see that all young language learners, whether in their first or second language, slowly change from a child-like performance to an adult-like performance.

Anchor time

In both languages under consideration, the standard way of (re)telling stories by adults seems to be by means of reference to actions that have happened in the past. As regards tense this would generally mean the use of the *accompli* in Moroccan Arabic and the use of past tense in Dutch. We suppose that our informants are on their way to standard adult performance in their respective languages, therefore their usage of time anchoring will be developing towards this adult-like distribution.

The children of the younger age groups (age 4 to 7) in Moroccan Arabic mostly alternated the *accompli* and the *inaccompli* in their retellings without clear motivation. The children of the older age groups (aged 8 to 10) showed a preference for the *accompli*, coming closer to the adult norm. This applied to both monolinguals and bilinguals. For Dutch, almost the same can be said: the younger children (age 5 and 7) often mixed tenses (the bilingual children) or used only present tense (the monolingual children) as anchors for their stories. The older children (age 9) preferred past tense (the bilingual children even more than the monolingual children).

We see that the 5- and 7-year-old monolingual children produced fewer stories with mixed tenses, which might indicate that they became more consistent in their use of tense at an earlier age than the bilingual children. This was true for both languages.

Aspectual features

In Moroccan Arabic, for both bilingual and monolingual informants, there was a decrease in occurrences of the bare prefixed form. This is a form with very specific meanings and it is most probably overgeneralized by the younger children. Over time, the most frequently used forms were the unmarked prefixed and suffixed forms. The use of active participles decreased over time. The younger children used them for expressing the progressive aspect, whereas the older children used the *ka-* + prefixed form to express this meaning.

We also see that the monolingual children had a much more even distribution of the use of different (combinations of) forms. Their capacity to use all (combinations of) forms that are available in their language seemed more in balance than that of their bilingual peers.

Temporal adverbials

As regards the use of temporal adverbials, the bilingual children seemed to be less able than the monolingual children to establish subtle temporal relations that are characteristic for good story telling. They strongly overgeneralized the use of certain forms, usually the ones that do not require clause subordination or inversion of the basic word order. The monolingual children made more and more standard-like use of these complex adverbials, conjuctions and particles. This indicates that there is a difference between bilingual and monolingual children on a higher level, i.e., a level that does not show in everyday communication. This holds for both languages. The data point to the concept of a Basic Variety, discussed by Dietrich et al. (1995). The language production of these bilingual children seemed very fluent and native-like when listened to. But when analysed, it turned out to be less sophisticated than that of monolingual children.

In general, all children strongly adhered to the principle of natural order for reporting events. Not many children used complex retelling devices to move back and forth in reporting the events of the *frog story*. Part of this is caused by the fact that the children told the story picture by picture while the pictures were lying in front of them, in a chronological order. But even in scenes where it would be rather natural to either look back or forth in time, this was not done. This became very clear from the fact that there was not one occurrence of a positional adverbial referring to 'before' in the whole data-set. Many informants obeyed the principle of derivational simplicity as well. This was especially true for the bilingual children. They used very few temporal adverbials or constructions that demanded complex morphology.

7 CONCLUSIONS AND DISCUSSION

7.1 INTRODUCTION

At the beginning of this book, the central questions concerned (1) the development of the *grammatical systems* of young language learners who were in the stage of learning two languages at the same time, and (2) the mastering of *pragmatic rules* by young language learners who were in the stage of learning two languages at the same time. Two typologically very different languages were chosen, Moroccan Arabic and Dutch, in order to find out whether there was any *transfer* to be found in some or all of the domains, and in order to find out if particular developments were *universal* or *language-specific*. Children at school age (aged 4 to 10) were chosen as informants because at that age, the initial language acquisition has already taken place and the development of a more advanced language acquisition can be observed.

In this final chapter, we will summarize the conclusions found in our chapters on the development of grammatical competence (Chapters 3 and 4) and those found in the chapters on the development of pragmatic competence (Chapters 5 and 6) in Sections 7.2 and 7.3. In Section 7.4 we will present our general conclusions as regards the language development of the bilingual children, in relation to the questions and issues that we referred to at the beginning of this section. In addition, a theoretical and a practical perspective of this research will be presented: suggestions will be made for future research (7.5.1) and some implications for the field of education that can be based on our conclusions will be presented (7.5.2).

Three groups of informants participated in this study: one bilingual core group of Moroccan children (living in the Netherlands), one monolingual control group of Dutch children (living in the Netherlands) and one monolingual control group of Moroccan children (living in Morocco). There were two age groups of informants from which data were collected in a longitudinal way, resulting in informants aged 4 to 7 in the first age group and informants aged 8 to 10 in the second age group. The bilingual group performed all tasks in both L1, Moroccan Arabic, and L2, Dutch. The monolingual control groups performed the tasks in one language each: the Dutch group in Dutch and the Moroccan group in Moroccan Arabic.

7.2 DEVELOPMENT OF GRAMMATICAL COMPETENCE

The development of grammatical competence was investigated by means of two experimental tasks on anaphoric reference and relative clauses, respectively. Both tasks concerned the analysis of complicated sentences. The informants had to find out how sentence-internal relations were organized. The correct performance of analytical tasks such as these require an advanced knowledge of grammatical rules. The *error patterns* in the performances of the informants showed the strategies they used to perform a task they do not (yet) master completely.

7.2.1 Anaphoric reference

In Chapter 3, we saw that there was a difference between the acquisition of bound anaphors, on the one hand, and free anaphors, on the other. In the oral experiment, we looked at the analytical skills of the informants concerning the interpretations of sentences such as *the friend of Karim pinches himself* and *the friend of Karim pinches him*. In this experimental task our central focus was the correct understanding of *himself* (a bound anaphor) and *him* (a free anaphor). It turned out that the youngest group of informants had a better understanding of sentences where the pronoun *him* is used than of sentences with the reflexive *himself*. At about the age of 8, the difference in comprehension of these two types of anaphors had disappeared. This was also approximately the age where differences between the bilingual and the monolingual children disappeared. In the younger age group, it was very clear that the bilingual informants lagged behind in the comprehension of these anaphors in comparison to the two monolingual control groups.

Another feature that turned out to be important was that quite a lot of mistakes were made in identifying the right actor in the sentences. Because we were mainly interested in what the developmental pattern of the comprehension of both anaphors (reflexive and non-reflexive) would look like, a new analysis was performed in which all sentences where only the identification of the actor was wrong, were considered correct (because the right action, either reflexive or non-reflexive, was chosen). We then saw that the misinterpretation of the actors had not influenced the results on anaphoric reference. It was still the case that in the youngest age group, performance in sentences with a free anaphor (*him*) were better than in sentences with a bound anaphor (*himself*) and that this difference disappeared for the older age group. All groups came out at approximately the same percentage (95) of correct scores at the end of this study, without major differences between bilingual and monolingual children after the age of 5.

There seemed to be universal principles at work here, rather than bilingualism-specific characteristics. A possible explanation for the fact that the younger informants performed better in items with a free anaphor than in items with a bound anaphor is that these informants are in a process of overgeneralizing the meaning of a word they know quite well (*him*) and undergeneralizing a word

they are less familiair with (*himself*). If it is only knowledge of a particular word they lack, it has been suggested to repeat the experiment in Dutch with the use of a slang variant of *zich* ('himself') which is often used in the language of the peer group these children grow up in, namely *z'n eigen* ('his own'). It might be interesting to see if the use of such a word changes the results. In our opinion it very probably would not because in that case the results for Arabic, where there is not such an often-used slang variant of the bound anaphor, would be different from (i.e., better than) the results in Dutch, and they are not. The most plausible explanation still seems to be the overgeneralization of the pronoun *him* by the youngest children. In the results of the older children, we find support for the theory that the understanding of reflexive actions (self-oriented) precedes the understanding of actions in which the actor is not the same person as the undergoer (other-oriented).

In a written task on anaphoric reference in Dutch, only performed by the older informants (and all their classmates, which provided us with an *additional* control group of informants of many different ethno-linguistic backgrounds), children were confronted with different kinds of anaphoric reference, such as *intersentential* and *intrasentential* reference (between and within sentences respectively), *forward* and *backward* reference (referent precedes pronoun and pronoun precedes referent respectively), reference to a *noun* and reference to a *sentence*. These different kinds of anaphoric reference were inserted in a number of short stories the informants had to read. The informants had to answer one multiple choice question at the end of each story. It turned out that the Dutch control group performed rather well at the age of 8 and that there was no significant change in performance over time. This means that they had already reached their ceiling at age 8. For the bilingual core group and the additional multilingual control group, *time* turned out to be a significant factor, which tells us that these informants still made progress and therefore would reach their ceiling later than the monolingual Dutch informants. The bilingual informants also had more difficulty with the processing of intrasentential reference than with the processing of intersentential reference. The monolingual Dutch group did not show such a difference in comprehension. It seems plausible that a sentence gets more difficult when there is coindexing involved within that particular sentence. There is a lot of compact information within one sentence in the case of intrasentential coindexing. This might explain why the bilingual children had more difficulty in processing such sentences than in processing parts of texts that have this information scattered over more than one sentence. For the additional multilingual control group, reference to a sentence also turned out to be easier than reference to a noun, which might be caused by the fact that a sentence usually contains more information than a noun and therefore makes it easier to identify the referential relationship. It seemed to be a universal rule that forward reference is easier than backward reference, because this was true for all groups involved at all ages.

For the Dutch control group, there did not seem to be much difference as to what kind of anaphoric relationship there was between or within sentences. The informants had rather high correct scores and did not have specific difficulties with the different factors that were involved in this task. For the bilingual core group and the additional multilingual control group, it seems important that the information they had to discover from the sentences in the stories is presented as overtly as possible. This means that it is easier to see the relationship between a pronoun and its antecedent when they are not in the same sentence[1] and also that it is easier if a pronoun refers to a whole sentence instead of to a single word.[2] It gives the reader more information and therefore something to hold on to in order to establish the right relationship between antecedent and pronoun.

7.2.2 Relative clauses

In Chapter 4, the design and results of an experiment on the comprehension of relative clauses were presented. The informants were asked to act out sentences that were read to them with toy animals placed in front of them. The sentences were constructed on the basis of a complicated set of factors. Four different types of restrictive relative clauses were constructed in which the grammatical role of the head noun in both the main clause and the relativized clause varied. *Subject* and *object* were alternated. This created four different combinations: sentences in which the head noun was subject in both the main clause and the relativized clause (*ss*), sentences in which the head noun was object in both clauses (*oo*), sentences in which the head noun was subject in the main clause and object in the relativized clause (*so*), and sentences in which this was exactly the other way around (*os*).

Another variable factor was word order. This factor could only be varied for Moroccan Arabic which can have two different word orders (*svo* and *ovs*) for main clauses. Two different word orders in combination with the four types of sentences described above led to eight different configurations in Moroccan Arabic. The sentences were of the type *the lion that strokes the bear, kisses the monkey* (ss) and *the lion strokes the bear that kisses the monkey* (os).

If we compare the performances of the informants on the different sentence types, we see that there were quite some differences. First of all, there was a large difference between the scores on the two different word orders in Moroccan Arabic, with *svo* (subject-verb-object) on the one hand and *ovs* (object-verb-subject) on the other. The bilingual group clearly had higher scores on sentences that had *svo* word order in the main clause than on sentences with *ovs* word order. Their scores on all four sentence types in combination with *svo* word order were

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1 In the oral experiment, the anaphoric reference was *intrasentential*.

2 In the oral experiment, reference was made to a *noun phrase*: either a proper noun (Martijn/Karim) or 'the friend of'.

50% or higher by the time they reached the age of 10. This cannot be said of sentences that have *ovs* word order in the main clause: all scores stayed well under 50 percent. The monolingual control group, however, showed an opposite result: in general, the informants performed better on sentences with an *ovs* word order in the main clause than on sentences with *svo* word order. But the differences between scores on both word orders were not nearly as great as they were for the bilingual children. We concluded from these results that the bilingual children relied on other factors to help them resolve this task than the monolingual children. The bilingual children knew that the basic word order for complex sentences in Moroccan Arabic is *svo*. They had difficulty in picking up the meaning of sentences that had another word order. In fact, they interpreted *ovs* sentences as if they did not have this complex word order. The informants did not seem to be able to analyse or use the grammatical markers that were present in these *ovs* sentences. The monolingual children did. The bilingual children seemed to gain less from grammatical cues than the monolingual children. The bilingual children took the basic variety they had mastered (*svo* word order) as their starting point and interpreted "deviant" sentences in such a way that they also seemed to be part of this basic variety.

Turning to the different sentence types in Dutch, we saw stunning similarities between the bilingual Moroccan children and the monolingual Dutch children: very high scores on *ss* sentences for all children and on *os* sentences for the older children. Scores on *so* and *oo* sentences were dramatically low. For a large part, the latter result was undoubtedly due to the grammatical structure of these sentences. The fact that we made use of number agreement in order to be able to construct a relativized clause in which the head noun was object (which is the case in both *so* and *oo* sentences) showed its effects at this point. Although grammatically correct, these sentences were very difficult to process. The informants will never have heard such sentences in everyday speech. As the informants were asked to act out the sentences and were committed to perform this task, they found strategies to deal with these sentences. They interpreted them in a way that seemed to be the most logical to them. As they had knowledge and comprehension of *ss* sentences at an early age and *os* sentences at a somewhat later age, they interpreted the *so* and *oo* sentences as if they were *ss* and *os* sentences. This interpretation pattern emerged in the error analysis that was performed on a subsample of the database (see Table 4.11).

On the basis of earlier research in the field of acquisition of relative clauses, four factors were suggested to play an important role in making sentences more or less difficult to comprehend. These factors were *grammatical cues* in the sentence, the *interruption of processing units* (= interruption of the main clause by the relativized clause), the *grammatical role of the head noun* (the differences between *ss, so, os* and *oo*) and the *sentence surface structure*. The grammatical cues (number agreement) offered in the different sentences did not turn out to be an important factor for the informants to help them interpret the sentences correctly. The interruption of processing units did not turn out to be a key factor

either. Because the processing units were interrupted in the case of *ss* and *so* sentences, and the informants had no difficulties with the *ss* sentences, we can safely conclude that for Dutch the grammatical role of the head noun was not a key factor either. The factor that turned out the most important for the children to provide them with a strategy for executing this task, was the one concerning basic sentence configuration.

A general pattern emerged from the errors the informants made in both Moroccan Arabic and Dutch. The majority of the errors were made in the interpretative performance of the second part of the sentence (the second action that had to be acted out). It did not matter whether this was a main clause or a relativized clause. This suggested that another factor also played an important role and that was the memory burden the informants can handle. Even though the informants were told that the sentences could be repeated as many times as they wanted, it looked like they were not able to remember entire sentences of this complexity. Only where sentences were concerned with complex grammatical markers at the beginning of the sentence, the children made mistakes in this first part as well. This even resulted in two mistakes in one sentence, meaning that neither one of the actions was performed correctly.

At the time the oldest informants reached the age of 9 and 10 years, we saw that they started to make some progress on the sentences that had so far been the most difficult for them to interpret. By this age, the informants started to become able to retain these sentences in their memory and they also began to understand the grammatical cues that were offered in the sentences. In this respect we found no large differences between bilinguals and monolinguals.

7.3 DEVELOPMENT OF PRAGMATIC COMPETENCE

The development of pragmatic competence was investigated by analysing semi-spontaneous speech, produced by the informants. The informants were asked to retell a story on the basis of a series of pictures. These utterances were analysed for two linguistic domains. We looked at the way the informants referred to two different characters that played a role in the story (topic continuity). It is the reteller's task to make sure that the listener understands who is the topic at the moment of speech. The second domain we investigated is temporality. We looked at how the informants established temporal relations between sentences and between different parts of the text. This synthetic task differs from the analytical tasks discussed above, in that it did not involve applying grammatical rules, but the establishment of text-internal relations. There is not one correct way to do this; there are many possibilities. The main purpose is that the listener understands what the speaker means. One utterance is more opaque than the other, but cannot therefore be called wrong. Systematic error patterns, as we witnessed for the analytical tasks, cannot be observed here. But the choices our informants made, changed over time, as their performances become more and more adult-like as

they get older. These changes showed *developmental patterns* that gave us more insight into the way informants structured their utterances.

7.3.1 Topic continuity

In Chapter 5, the domain of analysis was topic continuity. For this domain of analysis, the informants had to retell the story of a boy and a dog in search of a frog (the classic *frog story*, a booklet often used for semi-spontaneous speech elicitation in many research projects). These retellings were recorded on audiotape, transcribed and studied. We paid special attention to the ways in which the informants referred to the main characters of the story. In retelling the story, the informants predominantly used nouns as a means to *introduce* the main characters. The only exception were some of the youngest children, who used bare nouns, pronouns and sometimes even zero references at the time they introduced the boy or the dog. The older the children got, the more often they started using indefinite nouns for the introduction of the boy. This was also true for the dog, but to a lesser extent. For reference to human beings, the older children were more inclined to use the adult-like way of introducing characters than for non-human beings.

The second point of attention was the way in which the informants referred to the boy and the dog in case of reference *switching*. By this we mean that a certain character is not the subject in utterance x, but it is the subject in utterance x + 1. How do the informants switch to this character? By means of what type of reference (nominal, pronominal or zero-reference) do they re-introduce this character? It turned out that again there was a difference as regards the boy, on the one hand, and the dog, on the other. All children made switches to the dog almost exclusively by means of nominals. The pattern of switches to the boy was not that clear. The younger children made a lot of use of pronouns (in Dutch and Moroccan Arabic) and zero references (in Moroccan Arabic) in order to switch to the boy, whereas the older children tended to make more use of definite nouns.

The third aspect we looked at was reference *maintenance*. Here we paid attention to how the informants referred to a character when it had also been the topic of the previous sentence. For reference maintenance to the boy, most informants used pronouns. For maintaining reference to the dog, however, there were still many nouns. It seems that also here the informants made a difference between reference to a human being, on the one hand, and a non-human being, on the other. They used explicit markers (a noun, such as *the dog* is more explicit than, for example, a pronoun, such as *he*) to refer to the dog, although in case of reference maintenance this was not necessary. In case of the boy, these explicit markers were not deemed to be necessary for the listener in order to understand who the topic of the utterance was (cf. the thematic subject principle, Karmiloff-Smith 1981).

The fact that the oldest informants came close to an adult-like way of referring to characters did not come as a surprise. It is also logical that the

youngest children more often used less specific markers than the older ones (such as a pronoun in the case of a referent switch). The fact that the bilingual informants no longer differed much from the monolinguals after age 8 (in the production of topic continuity), is also a phenomenon we already observed in the chapters on the comprehension tasks. The interesting point, however, is to see which strategies the children used that caused them to use pronominal reference in the case of switches and nominal reference in the case of referent maintenance, and how this pattern developed over time. Did the youngest children use pronominal and nominal reference for switches and maintenance randomly and unmotivatedly, while the older children did this on the basis of certain strategies, and were there any differences between bilinguals and monolinguals in this respect?

Some of the youngest children retold a story in such a way that the result was not really what adults would classify as a story. They described what they saw in the pictures, but they did not yet put relations (causes and consequences) between the different parts of the story. They described each picture as if it were an isolated situation, until they reached the end of the booklet. Therefore it was possible to come across a retelling in which the persons are introduced (at least to adult standards) over and over again: *a boy is sitting in the room, a boy goes to sleep, a boy wakes up, a boy looks at the jar.* This goes for both bilingual as well as monolingual children and no longer occurred (or hardly occurred) after the age of 5. We can therefore see this as a general learning principle, i.e., not specifically as something children learning a second language do, but as something children learning *any* language do.

In the retellings of the older children, we found more motivated use of nouns in maintenance and pronouns / zero reference in switches. As these occurred in the retellings of both bilingual and monolingual children, we can again look upon them as universal strategies. We will mention a few here.

At the *beginning of a new episode* in a story, a storyteller is inclined to reintroduce the main character, although this character is already known and may have even been the subject of the previous utterance.

In some cases, the *linear distance* between the last time the character was mentioned and the reference to this character is deemed to be too large by the storyteller. Although from a syntactical point of view this character is still the topic of the main clause, the storyteller does not want to use an implicit marker (pronoun or zero reference) to refer to this character. This situation may have been created by the use of many subordinate clauses or the occurrence of a lot of stuttering, restarting, repetition or correction. In this case the older children preferred to use a full noun phrase to refer to the character instead of a pronoun. Although there is no problem with a pronoun from a syntactical point of view, there is one from a pragmatic point of view. The same can be said for overt clarifications made by the storyteller. When (s)he thinks a reference already made is not clear enough, (s)he can opt for a clarification by means of a full noun phrase. This happens especially after the use of a pronoun in a switch.

We also witnessed the reversed in cases in which the informants used a pronoun where one would expect a full noun phrase (i.e., in case of a switch). This can also be part of a strategy. If the storyteller presupposes a certain amount of knowledge (of the *frog story* in particular or of the world in general), it is not always necessary to refer to a character in a fully explicit way. The listener will understand the reference anyway and there is no need to elaborate on the identity of the character. We also witnessed another feature that seems to have universal characteristics. It concerns the difference between reference to persons and to animals. In the case of switches, the informants used a pronoun much more often when it concerned the boy than in cases where the dog was involved. Apparently the higher degree of *primacy* made it more acceptable to use a less explicit way of reference.

A specific feature of Moroccan Arabic relevant in this context is *topicalisation*. In this case, the topic (focus) of a sentence is put at the beginning of the utterance, while it is not the subject of the sentence (e.g.: *the dog, the bees follow him*). This is a productive means in narratives in Moroccan Arabic to stress a word that is not the subject of the sentence. The difficulty in this respect is that, from a functional point of view, the subject of the clause is less important than the topicalized word, but the subject is included in our analysis and the topic is not. This is a point of consideration for future research (see Section 7.8).

In general, we found that there are few differences between the different groups of informants. Except for the 4-year-old bilinguals, who used a lot of bare nouns, and the fact that the bilingual children did not use proper nouns as often as monolinguals did, we found that all groups of informants performed in a very similar way. There was no difference in development over time for Moroccan bilingual and Moroccan monolingual children, or for Moroccan bilingual and Dutch monolingual children. The developmental strategies the informants adhered to seemed to be universal rather than dependent on language background or the fact that a child is monolingual or bilingual.

7.3.2 Temporality

Three central aspects played a role in the chapter on temporal reference (Chapter 6). With respect to *time anchoring* of the stories, we saw that there is also little difference between the groups of informants. We observed some universal learner strategies in that the youngest children tended to place a story in a "here-and-now" context and therefore often used the present tense (Dutch), or the 'inaccompli' (Moroccan Arabic). The older children performed in a more adult-like fashion, making far greater use of the past tense (Dutch), or the 'accompli' (Moroccan Arabic).

With respect to *aspectual features* in Moroccan Arabic, we found that the older the children got, the more they used forms with non-specific meanings. The youngest children did use forms with specific meanings but not in a way adults would have done. They overgeneralized the simple verb forms they knew. As they

grew older they made extensive use of the unmarked prefixed and suffixed forms. Most older children were also consistent in their choice of verb form throughout the story.

A clear difference between bilingual and monolingual informants was found with respect to *temporal adverbials*. The bilingual children made far less use of these adverbials which can make a story-retelling sound advanced and sophisticated. There was a difference in the *amount* of temporal adverbials bilinguals and monolinguals used as well as in the *variety* of temporal adverbials they used. The bilinguals seemed to overgeneralize a lot. Once they found an adverbial that they could use, for example at the beginning of a sentence as a marker of chronological order, they used it productively. The bilingual children made frequent use of adverbials that can be put at the beginning of a main clause without bringing about a change in the basic structure of the sentence. The monolingual children (and this was the case for both Moroccan Arabic and Dutch) were more inclined to use subordinate conjunctions than the bilingual children. They seemed to feel more secure than the bilingual informants about adapting the word order to the requirements of these conjunctions. In conclusion, the bilingual children used "simple" adverbials that do not bring about changes in the basic structure of a sentence and then overgeneralized them, whereas the monolingual children used more sophisticated adverbials, conjunctions and particles that require knowledge of rules and consequences concerning subordination and inversion of basic word order, and did so in a more adult-like fashion (i.e., without overgeneralizations). Similar behaviour has been noted by Dietrich et al. (1995) who referred to this phenomenon as Basic Variety.

7.4 GENERAL CONCLUSIONS

This study focused on various aspcts of the grammatical and pragmatic competence of bilingual and monolingual informants. The bilingual core group showed a steady improvement of abilities in both languages, particularly in Dutch while most of them had hardly ever been in contact with before the age of 4.

With respect to their grammatical competence in *Dutch*, the bilingual children did not differ much from their monolingual Dutch peers. They did differ at an early age but after the age of 8 these differences had almost evened out. This shows that there is some difference in the *rate* of acquistion, but not so much in the *structure* of acquisition. The order in which they learn to analyse sentences that differ in complexity is very similar. For *Moroccan Arabic*, we see that the bilingual informants, compared to their monolingual Moroccan peers, lag behind considerably in one aspect of their mastery of complex sentences (i.e. word order in relative clauses). After 4 to 5 years in the Dutch school system, the grammatical competence of our core group of informants in the *L2* is very similar to that of monolingual Dutch children. Their grammatical competence in the *L1*, however, seems to lag behind when they have to analyse grammatical

complexities of a relatively high order.

With respect to pragmatic competence, we made the following observations. At first glance, the Moroccan bilingual childrenappeared to have become quite fluent in Dutch after the age of 7 and to have kept a certain level of native proficiency in Moroccan Arabic. They made use of a number of different devices to refer to person and to mark temporality. However, if we take a closer look at the utterances produced by the bilingual children on the one hand and the two groups of monolingual children on the other, the bilingual children used a more *restricted register* than the monolingual children. The bilingual children resorted more often to the construction of strings of main clauses, overgeneralization of particular devices, and the use of simple adverbials or conjunctions that can function at the beginning of a sentence and do not require any adjustments in the clause (such as word order inversion). These phenomena indicate that they have reached a level that is less advanced than that of the monolingual children. Basically, this pattern does not change over time. In other words, we found not only a difference in rate, but also a structural difference in language acquisition in this domain.

In Aarssen (1996), a study that was conducted in close collaboration with the present study, Turkish-Dutch bilingual children performed the same tasks. We see that some of the outcomes of the two studies are comparable and may indicate universal principles for children acquiring two languages more or less simultaneously. Aarssen found that the scores on the analytical tasks (comprehension of anaphoric reference and relative clauses) of young Turkish bilingual children (aged 4 to 7) were significantly lower than those of the monolingual children. However, the performances of bilinguals and monolinguals were similar for the older groups (aged 8 to 10). Aarssen found only one language-related aspect; here the monolingual Turkish children performed equally well on two different types of reflexives, whereas the bilingual children obtained significantly higher scores on one type (a lexically expressed reflexive) than on the other (a particle affixed to the verb). He suggested that this phenomenon might be the result of *transfer*, because in the Dutch task only one type of reflexive was used (a lexically expressed reflexive). A similar finding emerged from our data with respect to the two different word orders used in Moroccan Arabic. In our study the bilingual Moroccan children performed significantly better on one word order than on the other, whereas the monolingual children did not. In the Dutch version of the task one word order was used. This word order was the same as that used in Moroccan Arabic which the bilingual children scored highest on.

With respect to pragmatic competence, Aarssen observed similar developmental trends for both the monolingual and the bilingual children; the youngest children presented "static descriptions of single pictures" (1996:167), whereas "a dynamic account of a series of pictures by relating a series of foregrounded events and by alternating these events with backgrounded descriptions" (1996:167) was found to be used by the older children. This finding

differs from findings of the present study in that we did find structural differences between the groups of informants in the domain of pragmatic competence.

7.5 PERSPECTIVE

This research has generated a lot of information. So far the data have been analysed with regard to a number of linguistic domains for the purpose of gaining more linguistic insight into the bilingual development of children at school age. These data can, of course, be used for many other purposes. Other linguistic domains could be investigated and other goals formulated. In the following two sections I will make a number of suggestions for further research that could help us gain greater theoretical insight into the issue of bilingualism. In addition, I will present some implications based on the results found in this study, for practical use in educational contexts, where many teachers communicate with bilingual children on a daily basis.

7.5.1 Theoretical implications

This (pseudo-)longitudinal study with relatively large groups of informants generated a unique data-set that has provided a lot of information on language development over time of a group of Moroccan bilingual children. For our experimental tasks, it was very necessary to involve large groups of informants. In order to be able to perform statistical analyses on the results, a minimum of 25 children per group is advisable. We have managed to set up a unique database of (semi-)spontaneous speech produced by these children that gives us the opportunity to study trends both within and between the different groups of informants.

The disadvantage of such a large-scale approach is that it is very time-consuming to look at the individual progress, developments and strategies of each of the informants. It is obvious that these processes can be very insightful, as there must be variation within the different groups of learners. With respect to the experimental tasks it would be particularly interesting to look at the development of error patterns by individual informants, in order to find out if their individual development tells us anything different than that of the group as a whole. The spontaneous speech samples provide a source of material that would be even more challenging as a focus of further study. With respect to the domain of topic continuity, an in-depth study of the prestated topic (or topicalisation) in Moroccan Arabic would be extremely interesting. In the analysis of the *frog story*, it might be worthwile to include references other than those in subject position. With respect to the domain of temporality it would be a valuable exercise to scrutinize the transcripts with regard to the use of foregrounding vs. backgrounding vs. simultaneity. These are topics that can hardly be studied for groups as a whole, as there is much difference depending on the personal style of the individual

storyteller.

All data discussed in this study are available for any interested researcher. The transcripts can be found in the CHILDES database, supervised by Brian MacWhinney at Carnegie Mellon.[3] The transcripts of the current study can be found at *poppy.psy.cmu.edu* by means of anonymous ftp. Apart from the retellings of the frog story, there is also a considerable number of shorter stories (six pictures per story, six stories per child) available from this same database. These stories have been told by the same informants as those who featured in the current study, and also in the same languages, following the same design.

7.5.2 Practical implications

In day-to-day communication, the children of the bilingual core group seem to be fluent in both their L1 and L2 after 4 years of education in the Dutch school system. On the basis of this observation, teachers might be tempted to treat these children as if they are as competent in Dutch as native speakers, and as if they have a strong basis in their first language, Moroccan Arabic. From this research, however, we see that although our informants have a strong structural linguistic capacity, their pragmatic competence is not equal to that of monolingual children. They will not be able to analyse spoken or written texts or produce language in the same way their Dutch classmates will. In other words, we discovered a *hidden deficiency* although these children seem to be very fluent in both languages.

A point that has to be taken into consideration here is the view that a solid mastery of a first language will enhance the possibility to master a second language (Cummins & Swain, 1986). It is therefore necessary to stimulate these children in both their L1 and L2, and to stress the fact that both are equally important. It is of the utmost importance that these children encounter as many language contact situations, in both Moroccan Arabic and Dutch, as possible.

Taking into consideration the fact that most of these Moroccan children follow Home Language Instruction (HLI) in a language which is not their home language (Modern Standard Arabic is nobody's mother tongue, but the language of mass-media and religion), it might be advisable to introduce Moroccan Arabic as a target language of HLI. The introduction of Modern Standard Arabic can be

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[3] The system dates from 1981 when it was first discussed by a small number of researchers who wanted to create an archive for computerized transcripts: "A researcher can access data from a number of research projects that can be used to test a variety of hypotheses. The CHILDES database includes a wide variety of language samples from a wide range of ages and situations. Although more than half of the data comes from English speakers, there is also a significant component of non-English data. The total size of the database is now approximately 90 million characters (90 megabytes). The corpora are divided into six major directories: English data in CHAT format, English data in nonCHAT format, non-English data, story-telling or narrative data, data from books, data on language impairments, and data from second language acquisition" (MacWhinney 1991:222).

postponed to a later stage, for instance at the beginning of secondary education, as an optional subject, comparable to the way other languages are taught in the Dutch secondary school system. In addition to extra lessons to stimulate the acquisition of Dutch in a fairly short period to a level that is comparable to that of their Dutch classmates, this would create an ideal seed-bed for these children, enabling them to develop their two languages to the full and thus providing them with a solid linguistic basis on which they can build their school careers.

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APPENDICES

Appendix I Oral anaphoric reference task in Moroccan Arabic

Session 1

1.	ṣaḥeb Martijn ka-yeqreṣ ras-u	(the friend of Martijn pinches himself)
2.	ṣaḥeb Karim ka-ydafeɛ ɛla ras-u	(the friend of Karim defends himself)
3.	ṣaḥeb Karim ka-yxebbeš-u	(the friend of Karim scratches him)
4.	ṣaḥeb Martijn ka-yfekk-u	(the friend of Martijn releases him)
5.	ṣaḥeb Karim ka-yeġsel ras-u	(the friend of Karim washes himself)
6.	ṣaḥeb Martijn ka-yrebṭ-u	(the friend of Martijn ties him up)
7.	ṣaḥeb Karim ka-ydafeɛ ɛli-h	(the friend of Karim defends him)
8.	ṣaḥeb Martijn ka-yeġsel ras-u	(the friend of Martijn washes himself)
9.	ṣaḥeb Martijn ka-yqerṣ-u	(the friend of Martijn pinches him)
10.	ṣaḥeb Karim ka-yxebbeš ras-u	(the friend of Karim scratches himself)
11.	ṣaḥeb Martijn ka-yfekk ras-u	(the friend of Martijn releases himself)
12.	ṣaḥeb Karim ka-yrebṭ-u	(the friend of Karim ties him up)

Session 2

1.	ṣaḥeb Karim ka-yqerṣ-u	(the friend of Karim pinches him)
2.	ṣaḥeb Martijn ka-ydafeɛ ɛli-h	(the friend of Martijn defends him)
3.	ṣaḥeb Martijn ka-yxebbeš ras-u	(the friend of Martijn scratches himself)
4.	ṣaḥeb Karim ka-yfekk ras-u	(the friend of Karim releases himself)
5.	ṣaḥeb Martijn ka-yġesl-u	(the friend of Martijn washes him)
6.	ṣaḥeb Karim ka-yerbeṭ ras-u	(the friend of Karim ties himself up)
7.	ṣaḥeb Martijn ka-ydafeɛ ɛla ras-u	(the friend of Martijn defends himself)
8.	ṣaḥeb Karim ka-yġesl-u	(the friend of Karim washes him)
9.	ṣaḥeb Karim ka-yeqreṣ ras-u	(the friend of Karim pinches himself)
10.	ṣaḥeb Martijn ka-yxebbeš-u	(the friend of Martijn scratches him)
11.	ṣaḥeb Karim ka-yfekk-u	(the friend of Karim releases him)
12.	ṣaḥeb Martijn ka-yerbeṭ ras-u	(the friend of Martijn ties himself up)

Oral anaphoric reference task in Dutch

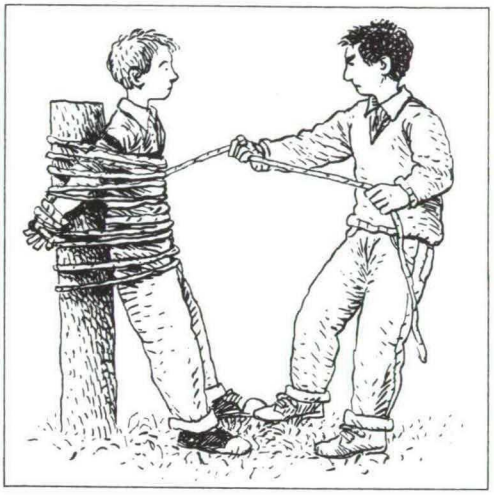
Session 1

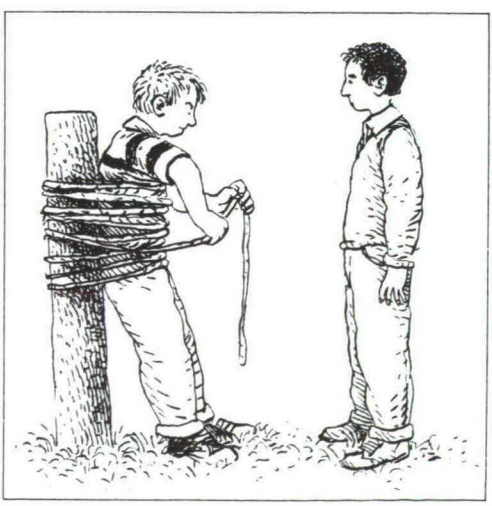
1.	De vriend van Martijn knijpt zich	(the friend of Martijn pinches himself)
2.	De vriend van Karim verdedigt zich	(the friend of Karim defends himself)
3.	De vriend van Karim krabt hem	(the friend of Karim scratches him)
4.	De vriend van Martijn bevrijdt hem	(the friend of Martijn releases him)
5.	De vriend van Karim wast zich	(the friend of Karim washes himself)
6.	De vriend van Martijn bindt hem vast	(the friend of Martijn ties him up)
7.	De vriend van Karim verdedigt hem	(the friend of Karim defends him)
8.	De vriend van Martijn wast zich	(the friend of Martijn washes himself)
9.	De vriend van Martijn knijpt hem	(the friend of Martijn pinches him)
10.	De vriend van Karim krabt zich	(the friend of Karim scratches himself)
11.	De vriend van Martijn bevrijdt zich	(the friend of Martijn releases himself)
12.	De vriend van Karim bindt hem vast	(the friend of Karim ties him up)

Session 2

1.	De vriend van Karim knijpt hem	(the friend of Karim pinches him)
2.	De vriend van Martijn verdedigt hem	(the friend of Martijn defends him)
3.	De vriend van Martijn krabt zich	(the friend of Martijn scratches himself)
4.	De vriend van Karim bevrijdt zich	(the friend of Karim releases himself)
5.	De vriend van Martijn wast hem	(the friend of Martijn washes him)
6.	De vriend van Karim bindt zich vast	(the friend of Karim ties himself up)
7.	De vriend van Martijn verdedigt zich	(the friend of Martijn defends himself)
8.	De vriend van Karim wast hem	(the friend of Karim washes him)
9.	De vriend van Karim knijpt zich	(the friend of Karim pinches himself)
10.	De vriend van Martijn krabt hem	(the friend of Martijn scratches him)
11.	De vriend van Karim bevrijdt hem	(the friend of Karim releases him)
12.	De vriend van Martijn bindt zich vast	(the friend of Martijn ties himself up)

Example pictures of the oral anaphoric reference task





Appendix II Reading task on anaphoric reference in Dutch

1/version a (intersentential, forward reference to a sentence)

Ricardo had maandag vrij terwijl zijn moeder aan het werken was. Moeder wilde dat hij klaar zou zijn met het verven van het hek. Toen zij thuis kwam om te eten, was zij heel boos, omdat hij er nog steeds niet mee begonnen was. In plaats daarvan had hij de band van zijn fiets geplakt en zijn radio gemaakt. Zijn moeder vond het niet leuk.

Ricardo was free on Monday while his mother was working. Mother wanted him to have finished painting the gate. When she came home for dinner, she was very upset because he still hadn't started with it. Instead of that he had fixed the tyre of his bike and his radio. His mother did not like it.

1/version b (intersentential, backward reference to a sentence)

Ricardo had maandag vrij terwijl zijn moeder aan het werken was. Toen zij thuis kwam om te eten, was hij er nog steeds niet mee klaar. Ze was boos omdat hij nog steeds niet begonnen was met het verven van het hek. In plaats daarvan had hij de band van zijn fiets geplakt en zijn radio gemaakt. Zijn moeder vond het niet leuk.

Ricardo was free on Monday while his mother was working. When she came home for dinner he still hadn't finished it. She was upset because he still had not started painting the gate. Instead of that he had fixed the tyre of his bike and his radio. His mother did not like it.

question:

1. Wat had Ricardo nog niet gedaan toen zijn moeder thuis kwam?
   What had Ricardo not done yet when his mother came home?

O de band van zijn fiets plakken (fix the tyre of his bike)
O zijn radio maken (fix his radio)
O het hek verven (paint the gate)
O naar school gaan (go to school)

2/version a (intrasentential, forward reference to a noun phrase)

Bert en zijn vader gingen naar een speelgoed-winkel om te kijken naar dingen om mee te spelen. Zij wilden een electrische trein kopen omdat die in de aanbieding was. Bert zag ook nog een vliegtuig en een race-auto, maar die waren te duur. De vader van Bert zei dat hij moest wachten tot hij jarig was.

Bert and his father went to a toy-store to look at things to play with. They wanted to by an electric train because it was on sale. Bert also saw an aeroplane and a race-car, but they were too expensive. Bert's father said he had to wait untill his birthday.

2/version b (intrasentential, backward reference to a noun phrase)

Bert en zijn vader gingen naar een speelgoed-winkel om te kijken naar dingen om mee te spelen. Omdat die in de aanbieding was, wilden zij een electrische trein kopen. Bert zag ook nog een vliegtuig en een race-auto, maar die waren te duur. De vader van Bert zei dat hij moest wachten tot hij jarig was.

Bert and his father went to a toy-store to look at things to play with. Because it was on sale, they wanted to by an electric train. Bert also saw an aeroplane and a race-car, but they were too expensive. Bert's father said he had to wait untill his birthday.

question:

2. Wat was er in de aanbieding?
   What was on sale?

O een race-auto (a race-car)
O een electrische trein (an electric train)
O een vlieger (a kite)
O een vliegtuig (an aeroplane)

3/version a (intrasentential, forward reference to a sentence)

Ali en Esther zijn nieuwe vriendjes geworden en vertellen elkaar van alles. Esther zei tegen Ali dat zij wel eens met haar fiets op de stoep fietst. Ook vertelde zij dat ze in de winter wel eens op de vijver schaatst. Toen Esther zei dat zij wel eens op straat rolschaatst, geloofde Ali dat niet. Ali en Esther hebben veel lol samen.

Ali and Esther have become friends and are telling each other all sorts of things. Esther said to Ali that she sometimes rides her bike on the pavement. She also said that she occasionally skates on the pond in the winter. When Esther said that she also roller-skates on the street sometimes, Ali did not believe it. Ali and Esther have a lot of fun together.

3/version b (intrasentential, backward reference to a sentence)

Ali en Esther zijn nieuwe vriendjes geworden en vertellen elkaar van alles. Esther zei tegen Ali dat zij wel eens met haar fiets op de stoep fietst. Ook vertelde zij dat ze in de winter wel eens op de vijver schaatst. Ali geloofde het niet toen Esther zei dat zij wel eens op straat rolschaatst. Ali en Esther hebben veel lol samen.

Ali and Esther have become friends and are telling each other all sorts of things. Esther said to Ali that she sometimes rides her bike on the pavement. She also said that she occasionally skates on the pond in the winter. Ali did not believe it when Esther said that she also roller-skates on the street sometimes. Ali and Esther have a lot of fun together.

question:

3. Wat geloofde Ali niet?
   What did Ali not believe?

O dat Esther wel eens op straat rolschaatst (that Esther sometimes roller-skates on the street)
O dat Esther wel eens met haar fiets op de stoep fietst (that Esther sometimes rides her bike on the pavement)
O dat Esther wel eens in de winter op de vijver schaatst (that Ester occasionally skates on the pond in the winter)
O dat ze samen veel lol hebben (that they have a lot of fun together)

4/version a (intersentential, backward reference to a sentence)

Sonja had een konijn. Toen haar moeder terug kwam uit de winkel had Sonja het nog steeds niet gedaan. Moeder had gewild dat ze zijn hok schoonmaakte. Sonja had het konijn wel eten gegeven en verder had ze alleen maar met hem gespeeld. Moeder was wel een beetje boos.

Sonja had a rabbit. When her mother came back from the store Sonja still had not done it yet. Mother had wanted her to clean his hutch. Sonja had given the rabbit food and for the rest she had just played with him. Mother was a bit angry.

4/version b (intersentential, forward reference to a sentence)

Sonja had een konijn. Haar moeder wilde dat ze zijn hok schoonmaakte. Toen moeder terug kwam uit de winkel had Sonja het nog steeds niet gedaan. Sonja had het konijn wel eten gegeven en verder had ze alleen maar met hem gespeeld. Moeder was wel een beetje boos.

Sonja had a rabbit. Her mother wanted her to clean his hutch. When mother came back from the store Sonja still had not done it. Sonja had given the rabbit food and for the rest she had just played with him. Mother was a bit angry.

question:

4. Wat had Sonja niet gedaan?
   What had Sonja not done?

O met het konijn spelen (play with the rabbit)
O het konijn eten geven (give the rabbit food)
O het konijn drinken geven (give the rabbit something to drink)
O het hok van het konijn schoonmaken (clean the hutch of the rabbit)

5/version a (intrasentential, backward reference to a noun phrase)

Tante Annie ging in een kleiner huis wonen. Tessa hielp haar tante Annie met verhuizen. Omdat die niet zwaar was, droeg Tessa een tafel naar de verhuiswagen. Er stonden ook nog een bed en een kast, maar die waren veel te groot. Tante Annie zei dat de verhuizers die wel zouden dragen.

Aunt Annie went to move into a smaller house. Tessa was helping her aunt Annie with the removal. Because it was not heavy, Tessa was carrying a table to the removal van. There were also a bed and a cupboard, but they were way too big. Aunt Annie said that the moving man would carry them.

5/version b (intrasentential, forward reference to a noun phrase)

Tante Annie ging in een kleiner huis wonen. Tessa hielp haar tante Annie met verhuizen. Tessa droeg een tafel naar de verhuiswagen omdat die niet zwaar was. Er stonden ook nog een bed en een kast, maar die waren veel te groot. Tante Annie zei dat de verhuizers die wel zouden dragen.

Aunt Annie went to move into a smaller house. Tesse was helping her aunt Annie with the removal. Tessa was carrying a table to the removal van, because it was not heavy. There were also a bed and a cupboard, but they were way too big. Aunt Annie said that the moving man would carry them.

question:

5. Wat was niet zwaar? What was not heavy?

O de kast (the cupboard)
O de tafel (the table)
O het bed (the bed)
O de klok (the clock)

6/version a (intersentential, backward reference to a noun phrase)

Koen en zijn vader waren in de tuin aan het werken. "Let op" zei vader, "het zal niet lang meer duren, maar er zitten nu nog geen blaadjes aan." Ze plantten het kleine boompje. In de tuin stonden ook nog een struik en veel bloemen.

Koen and his father were working in the garden. "Pay attention" father said, it won't take long anymore, but there are no leaves on it yet." They planted the little tree. In the garder there were also a bush and many flowers.

6/version b (intersentential, forward reference to a noun phrase)

Koen en zijn vader waren in de tuin aan het werken. Ze plantten een klein boompje. "Let op" zei vader, "er zitten nu nog geen blaadjes aan, maar dat zal niet lang meer duren." In de tuin stonden ook nog een struik en veel bloemen.

Koen and his father were working in the garden. They planted the little tree. "Pay attention" father said, "there are no leaves on it yet, but that won't take long anymore." In the garder there were also a bush and many flowers.

question:

6. Waar zitten nu nog geen blaadjes aan? Where are no leaves on yet?

O de plant (the plant)
O de struik (the bush)
O de bloemen (the flowers)
O het boompje (the little tree)

7/version a (intrasentential, backward reference to a sentence)

Hassan zat in de klas. Ook al vond hij het niet leuk, ze gingen eerst een dictee doen. Daarna lazen alle kinderen een boek. Aan het eind van de morgen gingen ze sommen maken.

Hassan was sitting in the classroom. Even though he did not like it, they started doing a dictation. Then all children read a book. At the end of the morning they did sums.

7/version b (intrasentential, forward reference to a sentence)

Hassan zat in de klas. Hij vond het niet leuk dat ze eerst een dictee gingen doen. Daarna lazen alle kinderen een boek. Aan het eind van de morgen gingen ze sommen maken.

Hassan was sitting in the classroom. He did not like it that they started doing a dictation. Then all children read a book. At the end of the morning they did sums.

question:

7. Wat vond Hassan niet leuk? What did Hassan not like?

O dat ze een dictee gingen doen (that they were going to do a dictation)
O dat ze sommen gingen maken (that they were going to do sums)
O dat ze gingen zingen (that they were going to sing)
O dat ze een boek gingen lezen (that they were going to read a book)

8/version a (intersentential, forward reference to a noun phrase)

Tom ging samen met meneer de Vries wandelen. Ze kwamen in het bos. Toen zag Tom een hagedis. Meneer de Vries maakte er snel een foto van. Zij zagen ook nog een eekhoorn en een konijn. Mevrouw de Vries vond het een mooie foto.

Tom was walking together with mister de Vries. They arrived at the forrest. Then Tom saw a lizzard. Mister de Vries quickly made a picture of it. They also saw a squirrel and a rabbit. Mrs. de Vries liked the picture very much.

8/version b (intersentential, backward reference to a noun phrase)

Tom ging samen met meneer de Vries wandelen. Ze kwamen in het bos. Snel maakte meneer de Vries er een foto van. Toen zag ook Tom de hagedis. Zij zagen ook nog een eekhoorn en een konijn. Mevrouw de Vries vond het een mooie foto.

Tom was walking together with mister de Vries. They arrived at the forrest. Quickly mister de Vries made a picture of it. Then Tom saw the lizzard as well. They also saw a squirrel and a rabbit. Mrs. de Vries liked the picture very much.

question:

8. Waar maakte meneer de Vries een foto van?
   What did mister de Vries make a picture of?

O een konijn (a rabbit)
O een eekhoorn (a squirrel)
O een hert (a deer)
O een hagedis (a lizzard)

Appendix III Relative clauses task in Moroccan Arabic (session 1)

1	d-debb lli ka-yemseḥ l-qerd, ka-yqerṣ-u s-sbeɛ.	Q ← D ← S
2	d-debb, ka-ybus-u l-qerd lli ka-ymesḥ-u s-sbeɛ.	Q ↩ D S
3	s-sbeɛ ka-yeḍreb l-qerd lli ka-yemseḥ d-debb.	Q ↩ D S
4	d-debb ka-yeqreṣ s-sbeɛ lli ka-yḍerb-u l-qerd.	Q D → S
5	l-qerd lli ka-ybus-u s-sbeɛ, ka-yḍerb-u d-debb.	Q ← D S
6	l-qerd, ka-ymesḥ-u s-sbeɛ lli ka-ybus d-debb.	Q ← D ← S
7	s-sbeɛ lli ka-ybus-u l-qerd, ka-yeḍreb d-debb.	Q D ⇄ S
8	d-debb lli ka-yqerṣ-u l-qerd, ka-ymesḥ-u s-sbeɛ.	Q → D ← S
9	l-qerd ka-yemseḥ d-debb lli ka-ybus s-sbeɛ.	Q → D → S
10	l-qerd lli ka-yeḍreb d-debb, ka-ybus s-sbeɛ.	Q → D S
11	s-sbeɛ, ka-yḍerb-u d-debb lli ka-yeqreṣ l-qerd.	Q ← D → S
12	s-sbeɛ lli ka-yeḍreb d-debb, ka-ybus-u l-qerd.	Q D ← S
13	d-debb lli ka-yemseḥ s-sbeɛ, ka-yeqreṣ l-qerd.	Q ← D → S
14	l-qerd ka-ybus d-debb lli ka-yqerṣ-u s-sbeɛ.	Q → D ← S
15	s-sbeɛ, ka-yqerṣ-u d-debb lli ka-yḍerb-u l-qerd.	Q → D → S
16	d-debb lli ka-ymesḥ-u s-sbeɛ, ka-yeqreṣ l-qerd.	Q ← D ← S

Word order distribution / sentence type distribution / literal translation:

1 OVS	OS	the bear that strokes the monkey, the lion pinches him
2 OVS	SO	the bear, kisses him the monkey that strokes him the lion
3 SVO	OS	the lion hits the monkey that strokes the bear
4 SVO	OO	the bear pinches the lion that hits him the monkey
5 OVS	OO	the monkey that kisses him the lion, kisses him the bear
6 OVS	SS	the monkey, strokes him the lion that kisses the bear
7 SVO	SO	the lion that kisses him the monkey, hits the bear
8 OVS	OO	the bear that pinches him the monkey, strokes him the lion
9 SVO	OS	the monkey strokes the bear that kisses the lion
10 SVO	SS	the monkey that hits the bear, kisses the lion
11 OVS	SS	the lion, hits him the bear that pinches the monkey
12 OVS	OS	the lion that hits the bear, the monkey kisses him
13 SVO	SS	the bear that strokes the lion, pinches the monkey
14 SVO	OO	the monkey kisses the bear that pinches him the lion
15 OVS	SO	the lion, pinches him the bear that hits him the monkey
16 SVO	SO	the bear that strokes him the lion, pinches the monkey

Relative clauses task in Moroccan Arabic (session 2)

1	l-mešš lli ka-ybus l-far, ka-yqerṣ-u l-kelb.	F ← M ←K
2	l-mešš, ka-yḍerb-u l-far lli ka-ybus-u l-kelb.	F ⇆ M K
3	l-kelb ka-yeḍreb l-far lli ka-ybus l-mešš.	F ⇆ M K
4	l-mešš ka-ybus l-kelb lli ka-yḍerb-u l-far.	F ⌒ M →K
5	l-far lli ka-yḍerb-u l-kelb, ka-ymesḥ-u l-mešš.	F ← M K
6	l-far, ka-yḍerb-u l-kelb lli ka-ybus l-mešš.	F ⇇ M ←K
7	l-kelb lli ka-yqerṣ-u l-far, ka-yeḍreb l-mešš.	F ⌒ M ⇇K
8	l-mešš lli ka-ymesḥ-u l-far, ka-yḍerb-u l-kelb.	F → M ←K
9	l-far ka-yemseḥ l-mešš lli ka-yeqreṣ l-kelb.	F → M → K
10	l-far lli ka-yeḍreb l-mešš, ka-yeqreṣ l-kelb.	F ⇉ M K
11	l-kelb, ka-ymesḥ-u l-mešš lli ka-yeqreṣ l-far.	F ← M →K
12	l-kelb lli ka-yeqreṣ l-mešš, ka-ybus-u l-far.	F ⌒ M ⇇K
13	l-mešš lli ka-yemseḥ l-far, ka-ybus l-kelb.	F ← M →K
14	l-far ka-yeqreṣ l-mešš lli ka-ymesḥ-u l-kelb.	F → M ←K
15	l-kelb, ka-ymesḥ-u l-mešš lli ka-yqerṣ-u l-far.	F → M →K
16	l-mešš lli ka-ybus-u l-kelb, ka-yemseḥ l-far.	F ← M ←K

Word order distribution / sentence type distribution / literal translation:

1 OVS	OS	the cat that kisses the mouse, the dog pinches him
2 OVS	SO	the cat, hits him the mouse that kisses him the dog
3 SVO	OS	the dog hits the mouse that kisses the cat
4 SVO	OO	the cat kisses the dog that hits him the mouse
5 OVS	OO	the mouse that hits him the dog, strokes him the cat
6 OVS	SS	the mouse, hits him the dog that kisses the cat
7 SVO	SO	the dog that pinches him the mouse, hits the cat
8 OVS	OO	the cat that strokes him the mouse, hits him the dog
9 SVO	OS	the mouse strokes the cat that pinches the dog
10 SVO	SS	the mouse that hits the cat, pinches the dog
11 OVS	SS	the dog, strokes him the cat that pinches the mouse
12 OVS	OS	the dog that pinches the cat, the mouse kisses him
13 SVO	SS	the cat that strokes the mouse, kisses the dog
14 SVO	OO	the mouse pinches the cat that strokes him the dog
15 OVS	SO	the dog, strokes him the cat that pinches him the mouse
16 SVO	SO	the cat that kisses him the dog, strokes the mouse

Relative clauses task in Dutch (session 1)

1	De leeuw knijpt de beren die de aap aaien.	A ← B ← L
2	De apen die de leeuw aait, kussen de beer.	A ↷ B L
3	De leeuw slaat de apen die de beer aaien.	A ↷ B L
4	De beer knijpt de leeuwen die de aap slaat.	A B → L
5	De beer slaat de apen die de leeuw kust.	A ↶ B L
6	De leeuwen die de beer kussen, aaien de aap.	A ↶ B ← L
7	De leeuwen die de aap kust, slaan de beer.	A B ← L
8	De leeuw aait de beren die de aap knijpt.	A → B ← L
9	De aap aait de beren die de leeuw kussen.	A → B → L
10	De apen die de beer slaan, kussen de leeuw.	A → B L
11	De beren die de aap knijpen, slaan de leeuw.	A ← B → L
12	De aap kust de leeuwen die de beer slaan.	A B ← L
13	De beren die de leeuw aaien, knijpen de aap.	A ← B → L
14	De aap kust de beren die de leeuw knijpt.	A → B ← L
15	De beren die de aap slaat, knijpen de leeuw.	A → B → L
16	De beren die de leeuw aait, knijpen de aap.	A ← B ← L

Word order distribution / sentence type distribution / literal translation:

1 SVO	OS	the lion pinches the bears that stroke the monkey
2 SVO	SO	the monkeys that the lion strokes, kiss the bear
3 SVO	OS	the lion hits the monkeys that stroke the bear
4 SVO	OO	the bear pinches the lions that the monkey hits
5 SVO	OO	the bear hits the monkeys that the lion kisses
6 SVO	SS	the lions that kiss the bear, stroke the monkey
7 SVO	SO	the lions that the monkey kisses, hit the bear
8 SVO	OO	the lion strokes the bears that the monkey pinches
9 SVO	OS	the monkey strokes the bears that kiss the lion
10 SVO	SS	the monkeys that hit the bear, kiss the lion
11 SVO	SS	the bears that pinch the monkey, hit the lion
12 SVO	OS	the monkey kisses the lions that hit the bear
13 SVO	SS	the bears that stroke the lion, pinch the monkey
14 SVO	OO	the monkey kisses the bears that the lion pinches
15 SVO	SO	the bears that the monkey hits, pinch the lion
16 SVO	SO	the bears that the lion strokes, pinch the monkey

Relative clauses task in Dutch (session 2)

1	De hond knijpt de poezen die de muis kussen.	M ← P ← H
2	De muizen die de hond kust, slaan de poes.	M → P H
3	De hond slaat de muizen die de poes kussen.	M → P H
4	De poes kust de honden die de muis slaat.	M P → H
5	De poes aait de muizen die de hond slaat.	M ← P H
6	De honden die de poes kussen, slaan de muis.	M ← P ← H
7	De honden die de muis knijpt, slaan de poes.	M P ← H
8	De hond slaat de poezen die de muis aait.	M → P ← H
9	De muis aait de poezen die de hond knijpen.	M → P → H
10	De muizen die de poes slaan, knijpen de hond.	M → P H
11	De poezen die de muis knijpen, aaien de hond.	M ← P → H
12	De muis kust de honden die de poes knijpen.	M P ← H
13	De poezen die de muis aaien, kussen de hond.	M ← P → H
14	De muis knijpt de poezen die de hond aait.	M → P ← H
15	De poezen die de muis knijpt, aaien de hond.	M → P → H
16	De poezen die de hond kust, aaien de muis.	M ← P ← H

Word order distribution / sentence type distribution / literal translation:

1 SVO	OS	the dog pinches the cats that kiss the mouse
2 SVO	SO	the mice that the dog kisses, hit the cat
3 SVO	OS	the dog hits the mice that kiss the cat
4 SVO	OO	the cat kisses the dogs that the mouse hits
5 SVO	OO	the cat strokes the mice that the dog hits
6 SVO	SS	the dogs that kiss the cat, hit the mouse
7 SVO	SO	the dogs that the mouse pinches, hit the cat
8 SVO	OO	the dog hits the cats that the mouse strokes
9 SVO	OS	the mouse strokes the cats that pinch the dog
10 SVO	SS	the mice that hit the cat, pinch the dog
11 SVO	SS	the cats that pinch the mouse, stroke the dog
12 SVO	OS	the mouse kisses the dogs that pinch the cat
13 SVO	SS	the cats that stroke the mouse, kiss the dog
14 SVO	OO	the mouse pinches the cats that the dog strokes
15 SVO	SO	the cats that the mouse pinches, stroke the dog
16 SVO	SO	the cats that the dog kisses, stroke the mouse

Appendix IV Description of the *frog story* (Mayer 1969)

picture 1: In bedroom; boy and dog looking at frog in jar.
picture 2: Boy and dog sleeping in bed, frog escaping from jar.
picture 3: Boy and dog awake, looking at empty jar.
picture 4: Boy and dog searching for frog; boy in boots, dog in jar.
picture 5: Boy and dog in window; boy calling, dog with head stuck in jar.
picture 6: Dog falling out of window, boy looking at him.
picture 7: In front of house; boy with dog in arms, dog licking boy.
Jar broken on the ground.
picture 8: Boy and dog on edge of forest; boy calling, dog barking.
Beehive visible in tree.
picture 9: Boy calling into hole in the ground, dog jumping at beehive in tree.
picture 10: Boy puts hands to his nose, gopher comes out of the hole.
Dog standing against tree with beehive.
picture 11: Boy looking in hole in tree, beehive has fallen.
Dog still leaning against tree, gopher watching.
picture 12: Owl came out of hole, boy fell out of tree, bees chase dog.
picture 13: Boy leaning against rock, raising arms in defense against owl.
picture 14: Boy standing on rock, holding on to "sticks", calling.
Dog crawling on floor, owl watching.
picture 15: Boy being raised by antlers of deer (look like branches of tree).
Dog searching between rocks, owl still watching.
picture 16: Boy on top of head deer, running toward cliff.
Dog running in front of deer.
picture 17: Deer stops, boy and dog falling down.
picture 18: Boy and dog landing in the water. Deer watching.
picture 19: Dog sitting on top of head boy, boy makes gesture of listening (hand at his ear).
picture 20: Boy makes gesture to dog to be silent (finger at his mouth), leaning over dead tree which is lying in the water.
Dog is swimming in water.
picture 21: Boy and doy crawling over dead tree.
picture 22: Boy and dog on top of tree, two big frogs visible.
picture 23: Boy and dog on top of tree.
Seven little frogs come out of the bushes.
picture 24: Boy and dog leave, through water.
Boy waves and has one little frog in hand.
Two big frogs and seven little frogs sit on tree and watch them.
One little frog sits on the ground and looks up to the other frogs.

Appendix V Examples of transcripts using the conventions of the coding system CHAT (MacWhinney 1991)

Example transcript in Moroccan Arabic:

```
@Begin
@Participants:      FAT Fatima Target_Child, HAY Hayat
                    Research_Assistant
@Birth of FAT:      17-DEC-1982
@Age of FAT:        8-5-21
@Sex of FAT:        female
@Date of Recording: 7-JUN-1991
@Coding:            CHAT 0.89
@Coder:             Hayat
@Date of Coding:    22-JUL-1993
@Target Language:   moroccan-arabic
@Session:           2
@Location:          Leiden, The Netherlands
@Duration:          69 points (A072-141)
@Filename:          SLFAT91.4MM
@Comment:           text checked 4-JUN-1994 by Petra
@Stim:  frog story
*FAT:   wah2ed l#weld mca wah2ed l#kelb u wah2ed uh@i
        kikker@s.
*FAT:   kan uh@i &lk l#kelb bqa yshuf cend kikker@s.
*FAT:   u dak l#weld kan gaced.
*FAT:   dak l#weld msha yences.
*FAT:   u l#kelb nces.
*FAT:   dak [/] dak kikker@s hreb.
*FAT:   uh@i hoe@s heet@s &dee deze@s nou@s kikker@s?
*HAY:   j#jrana.
*FAT:   j#jrana!
*FAT:   u j#jrana herbat l~hum.
*FAT:   bqaw lebsu l#keswa.
*FAT:   mshaw yduwwru duwwru duwwru.
*FAT:   dak l#kelb h2sha ras~u fe#dik l#qerca.
*FAT:   u bqa yshuf feyn ra~h.
*FAT:   l#kelb uh@i h2s2el ras~u fe#l#qerca.
*FAT:   u dak l#weld <bqa yshuf> [/] bqa yshuf.
*FAT:   h2ell j#jaj u bqa yshuf berra wash ra~h temma.
*FAT:   l#weld gal le#l#kelb +"/.
*FAT:   +" ruh2 ntaya duwwer.
*FAT:   +" u ana gha#nebqa nshuf men [/] men j#jaja.
*FAT:   +" <bash &n> [//] u illa shuft~u ngul~l~ek aji
        ["].
*FAT:   l#kelb bqa yshuf.
*FAT:   u [/] uh@i u dak l#weld wqef u hezz~u u cegb~u.
*FAT:   iwa u bqa ydir likken@s l#kelb.
```

```
*FAT:   l#kelb u [/] u l#weld mshaw &l &l uh@i bos@s.
*FAT:   dak l#kelb shaf wah2ed uh@i # +/.
*HAY:   l#ceshsh dyal n#nh2el.
*FAT:   &sha shaf wah2ed l#ceshsh ntac n#nh2el.
*FAT:   u dak l#weld kan yshuf fe#l#ard2 wash kayen
        temma.
*FAT:   iwa u dak n#nh2el kull shi xrej men hadik uh@i
        +/.
*HAY:   l#ceshsh.
*FAT:   +, l#ceshsha.
*FAT:   u dak l#kelb [/] l#kelb bqa yshuf u yneggez.
*FAT:   dak l#weld xerjat cend~u wah2ed uh@i # l#fara.
*FAT:   iwa u dak l#kelb ra~h gheyr yelceb mca haduk
        uh@i n#nh2el.
*FAT:   iwa u dak l#weld uh@i t2ah2 men h2it uil@s [?].
*FAT:   iwa u [/] u t2ah2et hadik uh@i # +/.
*HAY:   l#ceshsh.
*FAT:   +, l#ceshsha ntac n#nh2el.
*FAT:   u bqa dak l#kelb yshuf.
*FAT:   iwa u <dak &lw> [/] dak l#weld t2lec cend &l
        uh@i wah2ed l#ceshsha fe [/] uh@i fe#sh#shejra.
*FAT:   u bqa yshuf wash ra~ha temma.
*FAT:   xrej [//] t2ah2 dak l#weld.
*FAT:   u d2her uh@i # +/.
*HAY:   muka.
*FAT:   +, xerjat cend~u muka.
*FAT:   u t2ah2 dak l#weld.
*FAT:   u n#nh2el bqa gheyr yji.
*FAT:   yji bezzaf.
*FAT:   iwa u dak l#weld bqa # naces hakka [//] mwerrek.
*FAT:   l#muka mshat.
*FAT:   l#weld dar hakka.
*FAT:   dar yedd~u cla ras~u.
*FAT:   l#weld ceyyet2 cla l#kelb.
*FAT:   xxx xxx.
*HAY:   ka#yceyyet2 cla j#jrana.
*HAY:   l#kelb hna u +/.
*FAT:   ceyyet2 cla j#jrana.
*FAT:   &l l#weld gcud fe#wah2ed uh@i +/.
*HAY:   l#ghzala.
*FAT:   +, sh#shejra [//] &ha fe#wah2ed &lgh l#ghzala.
*FAT:   iwa u rkeb cli~ha.
*FAT:   u dik l#ghzala mshat.
*FAT:   u l#kelb ra~h temma.
*FAT:   u dik l#ghzala ra~h nad2et wus2t2 l#ma.
*FAT:   iwa <u t2eyyeh2> [//] uh@i dik l#ghzala
        t2eyyh2at l#kelb u l#weld.
*FAT:   u t2ah2u fe#l#ma.
*FAT:   dak l#kelb t2ah2 cla l#weld.
*FAT:   iwa u l#kelb msha cla [//] &f fug cla dak
```

```
        l#weld.
*FAT:   u bghaw [//] ghadi yt2elcu.
*FAT:   ghadi yemshiw men l#ma.
*FAT:   l#weld u l#kelb bghaw ydexlu fe#wah2ed sh#shejra
        bash yshufu wash ra~ha temma.
*FAT:   l#weld u l#kelb rekbu fug~ha u hewwd~u.
*FAT:   <l#weld u l#kelb> [//] &lk l#weld msha nishan.
*FAT:   u l#kelb hewwed.
*FAT:   u l#kelb bqa gaced u l#weld bqa gaced.
*FAT:   u temmak ra~hum j#jranat s2#s2ghar u l#kbar.
*FAT:   shnu [//] u ma#cend~u~sh hadi xxx s#smiya?
*HAY:   iwa gha#ykun &temm xxx xxx xxx &temmi &fe
        bghiti.
*FAT:   uh@i Muhammed.
*FAT:   Muhammed lqa wah2ed j#jrana.
*FAT:   u msha +/.
*HAY:   dyalt~u bqa j#jrana xxx dyal~u.
*FAT:   u mshat men cend +/.
*HAY:   familie@s caila.
*FAT:   +, l#caila ntac~ha u mshaw.
*HAY:   u shnu qal l~hum?
*FAT:   u gal l~hum +"/.
*FAT:   +" bye bye.
@End
```

translation:

*FAT: a boy with a dog and a eh frog.
*FAT: the eh the dog was looking at the frog.
*FAT: and that boy was sitting.
*FAT: that boy went to sleep.
*FAT: and the dog slept.
*FAT: that that frog fled.
*FAT: eh what is this one, frog, called?
*HAY: frog.
*FAT: frog!
*FAT: and the frog fled from them.
*FAT: they started to put on clothes.
*FAT: they went to search and search and search.
*FAT: that dog put his head in that jar.
*FAT: and he started to look where he had gone.
*FAT: the dog eh got his head stuck in the jar.
*FAT: and that boy started to look started to look.
*FAT: he opened the window and started to look outside if he was there.
*FAT: the boy said to the dog:
*FAT: " you go and look."
*FAT: " and I will go look from from the window."
*FAT: " in order to ... and if I see him I will tell you to come."
*FAT: the dog started to look.

*FAT: and eh and that boy stood there and lifted him up and punished him.
*FAT: and then the dog began to lick.
*FAT: the dog and and the boy went to the the uh forest.
*FAT: that dog saw a eh...
*HAY: beehive.
*FAT: he sa saw a beehive.
*FAT: and that boy was looking in the ground if he was there.
*FAT: and then all those bees came out of that eh ...
*HAY: hive.
*FAT: hive.
*FAT: and that dog dog started to look and jump.
*FAT: near the boy a mouse popped out.
*FAT: and then that dog played with those eh bees.
*FAT: and then that boy eh fell because of the owl.
*FAT: and and then fell that eh ...
*HAY: hive.
*FAT: beehive.
*FAT: and that dog went on looking.
*FAT: and then that b that boy climbed towards eh a nest in eh in the tree.
*FAT: and he started to look if he was there.
*FAT: that boy left ... fell.
*FAT: and appeared an ...
*HAY: owl.
*FAT: near him an owl came out.
*FAT: and that boy fell.
*FAT: and the bees kept on coming.
*FAT: there came a lot.
*FAT: and then that boy was laying like this ... turned over.
*FAT: the owl left.
*FAT: the boy did like this.
*FAT: he put his hand at his head.
*FAT: the boy called the dog.
*FAT: xxx xxx.
*HAY: he was calling the frog.
*HAY: the dog is here and ...
*FAT: called the frog.
*FAT: the the boy sat on a eh ...
*HAY: deer.
*FAT: tree ... on a d deer.
*FAT: and then he rode on it.
*FAT: and that deer left.
*FAT: and there is the dog.
*FAT: and that deer stopped at the middle of the water.
*FAT: and they that deer made made the dog and the boy fall.
*FAT: and they fell into the water.
*FAT: that dog fell on top of the boy.
*FAT: and then the dog went on on top of that boy.
*FAT: and they wanted ... went to climb.
*FAT: they were coming out of the water.

*FAT: the boy and the dog wanted to go into a tree to see if she was there.
*FAT: the boy and the dog climbed on top of it and climbed down.
*FAT: the boy and the dog ... the d ... the boy went straight ahead.
*FAT: and the dog climbed down.
*FAT: and the dog sat down and the boy sat down.
*FAT: and there were the little frogs and the big frogs.
*FAT: what ... and doesn't he have xxxx a name?
*HAY: well it can be there xxx there whatever you want.
*FAT: eh Mohammed.
*FAT: Mohammed had found a frog.
*FAT: and he went ...
*HAY: his one ... the frog was xxx his.
*FAT: and she left from ...
*HAY: family family.
*FAT: her family and they left.
*HAY: and what did he say to them?
*FAT: and he said to them:
*FAT: " bye bye."

Example transcript in Dutch:

```
@Begin
@Participants:      FAT Fatima Target_Child, PET Petra
                    Researcher
@Birth of FAT:      17-DEC-1982
@Age of FAT:        8-5-28
@Sex of FAT:        female
@Date of Recording: 14-JUN-1991
@Coding:            CHAT 0.89
@Coder:             Petra
@Date of Coding:    24-JUL-1991
@Target Language:   dutch
@Session:           2
@Location:          Leiden, The Netherlands
@Duration:          53 points (A067-120)
@Filename:          SLFAT91.4NM
@Comment:           text corrected: 27-AUG-1991 and
                    13-JAN-1994 by Petra
@Stim:  frog story
*FAT:   de jongetje en de hond.
*FAT:   de hond kijkt in dat beker van de kikker.
*FAT:   ze slapen.
*FAT:   kikker &wi gaat weglopen.
*FAT:   de hond en [/] en de jongetje uh@i kijken in de
        pot en zien helemaal niks.
*FAT:   de jongetje trekt zun kleren aan.
*FAT:   de [/] de hond [!] kijkt in het fles.
*FAT:   de [/] de hond blijft &i met zun hoofd in de
```

```
        fles.
*FAT:   het jongetje kijkt door het raam.
*FAT:   het jongetje die zegt +"/.
*FAT:   +" ga jij maar even zoeken.
*FAT:   +" ik kijk wel door het raam.
*FAT:   dat [/] dat jongetje springt ook uit het raam.
*FAT:   hij [/] hij uh@i pakt de hond aan in zun handen
        en um@i ## likt hem.
*FAT:   hebben we deze al gehad eigenlijk?
*FAT:   deze verhaal?
*PET:   bij de marokkaanse juf.
*FAT:   ja oh@i hee@i leuk.
*FAT:   <ik vergeet het altijd> [?].
*FAT:   ze gaan in het bos zoeken.
*FAT:   de hond en de jongen.
*FAT:   <die jongen proest kikker [!] ["]> [//] uh@i die
        jongen roept kikker [!] ["].
*FAT:   de hond ziet een # bijennest.
*FAT:   hij gaat ermee spelen.
*FAT:   het jongetje die kijkt.
*FAT:   er komt een eekhoorn dur uit.
*FAT:   <dat jongetje> [//] uh@i dat hond die kijkt
        alleen maar tegen dat &m bijennest.
*FAT:   de [/] de bijennest valt op de grond.
*FAT:   de eekhoorn zit helemaal verder.
*FAT:   de jongetje die zit &he heel erg # in het uh@i
        in het hol te kijken of tie daar zit.
*FAT:   <maar uh@i &toe> [//] we hebben deze toch wel
        gedaan?
*FAT:   van eerst toen jij zei +"/.
*FAT:   +" de kikkertjes nog?
*PET:   ja met de marokkaanse juf.
*PET:   maar nog niet in het nederlands.
*PET:   dat hebben we nog niet gedaan.
*FAT:   oh@i ja ja.
*PET:   ja?
*FAT:   ja.
*FAT:   er komt een uh@i # uil aan.
*FAT:   die ziet al die bijen komen.
*FAT:   +" oh@i wat veel.
*FAT:   hij duwt het jongetje op de grond.
*FAT:   de uil zit boven hem.
*FAT:   de jongetje doet zun hand op zijn hoofd.
*FAT:   het jongetje gaat op de berg staan.
*FAT:   hij roept +"/.
*FAT:   +" kikker [!].
*FAT:   <hij &g zit in> [//] hij zit bij de # +/.
*PET:   een hert.
*FAT:   +, een hert op zijn kop.
*FAT:   die hert die brengt hem naar een heel [!] groot
```

```
        muurtje bij de [/] de vijver.
*FAT:   maar die [/] die uh@i uh@i hert die gooit hem in
        de vijver.
*FAT:   die jongetje en de hond die vallen.
*FAT:   het jongetje gaat naar de kant toe.
*FAT:   <het jongetje klimt &o> [//] het jongetje kijkt.
*FAT:   hij zegt +"/.
*FAT:   +" stil hoor.
*FAT:   <het jongetje klimt &o> [//] <die &na # de> [//]
        die jongetje klimt over het [/] het hele grote
        &s stam.
*FAT:   hij gaat er overheen en de hond ook.
*FAT:   <de jongetje> [//] en de hond die ziet de
        kikkertjes met kinderen.
*FAT:   twee kikkertjes.
*FAT:   +" aha@i [!] daar zit ie.
*FAT:   zegt [/] zegt de jongetje +".
*FAT:   hij pakt er een [= one] en zegt +"/.
*FAT:   +" daag!
*FAT:   en ik ben klaar.
*PET:   goed hoor.
@End
```

translation:

*FAT: the boy and the dog.
*FAT: the dog looks into that cup of the frog.
*FAT: they are sleeping.
*FAT: frog goes to walk away.
*FAT: the dog and and the boy eh look into the jar and see nothing at all.
*FAT: the boy puts on his clothes.
*FAT: the the dog! looks into the bottle.
*FAT: the the dog stays i with his head in the bottle.
*FAT: the boy looks through the window.
*FAT: the boy he says:
*FAT: " you go and search for a while."
*FAT: " I will look through the window."
*FAT: that that boy also jumps out of the window.
*FAT: he he takes the dog in his hands and eh ... licks him.
*FAT: did we do this one already by the way?
*FAT: this story?
*PET: with the Moroccan teacher.
*FAT: yes oh hey nice.
*FAT: (I always forget) ?
*FAT: they go search in the forest.
*FAT: the dog and the boy.
*FAT: that boy snorts frog! eh that boy calls frog!
*FAT: the dog sees a ... beehive.
*FAT: he is going to play with it.

*FAT: the boy he looks.
*FAT: a squirrel comes out of it.
*FAT: that boy ... that dog he just looks against that m beehive.
*FAT: the the beehive falls on the ground.
*FAT: that squirrel sits all the way further.
*FAT: the boy he sits ve very much to look in the eh the hole whether he is there.
*FAT: but the ... we have done this one already, haven't we?
*FAT: from first when you said:
*FAT: " (we) still (have to do) the froggies" ?
*PET: yes, with the Moroccan teacher.
*PET: but not yet in Dutch.
*PET: we haven't done that yet.
*FAT: oh yes yes.
*PET: okay?
*FAT: yes.
*FAT: an owl is coming.
*FAT: that one sees all those bees coming.
*FAT: " oh how many."
*FAT: he pushes the boy on the ground.
*FAT: the owl sits above him.
*FAT: the boy puts his hand on his head.
*FAT: the boy goes to stand on the mountain.
*FAT: he calls:
*FAT: " frog!"
*FAT: he g sits in ... he sits near the ...
*PET: a deer.
*FAT: a deer on his head.
*FAT: that deer he takes him to a very! big little wall near the the pond.
*FAT: but that that eh eh deer he throws him into the pond.
*FAT: that boy and the dog fall.
*FAT: the boy goes to the edge.
*FAT: the boy climbs o ... the boy looks.
*FAT: he says:
*FAT: " quiet now."
*FAT: the boy climbs o ... that one to the ... that boy climbs over the the very big t trunk.
*FAT: he goes over it and so does the dog.
*FAT: the boy ... and the dog sees the froggies with children.
*FAT: two froggies.
*FAT: " aha! there he is."
*FAT: says the boy.
*FAT: he takes one and says:
*FAT: " bye!"

Appendix VI Transliteration of Moroccan Arabic

name of letter in Standard Arabic	realization	transliteration in texts	transliteration in transcripts
1. hamzah	voiceless glottal stop	'	'
2. bâ'	as in **b**all	b	b
3. tâ'	as in **t**all	t	t
4. djîm	as in French **J**ean	ž	j
	or as in **g**ood	g	g
5. ḥâ'	voiceless pharyngeal fricative	ḥ	h2
6. xâ'	voiceless velar fricative, as in Dutch **k**achel	x	x
7. dâl	as in **d**ull	d	d
8. râ'	as in Dutch **r**iem	r	r
9. --	emphatic **r**	ṛ	r2
10. zay	as in **z**ero	z	z
11. sîn	as in **s**ore	s	s
12. šîn	as in **sh**ip	š	sh
13. ṣâd	emphatic velarized **s**	ṣ	s2
14. ḍâd	emphatic velarized **d**	ḍ	d2
15. ṭâ'	emphatic velarized **t**	ṭ	t2
16. ϵayn	voiced pharyngeal fricative	ϵ	c
17. ġayn	voiced velar fricative, as in French **P**aris	ġ	gh
18. fâ'	as in **f**ood	f	f
19. qâf	voiceless uvular stop	q	q
20. kâf	as in **c**at	k	k
21. lâm	as in **l**oose	l	l
22. mîm	as in **m**ouse	m	m
23. nûn	as in **n**one	n	n
24. hâ'	as in **h**ay	h	h
25. wâw	as in **w**orld	w	w
26. yâ'	as in **y**ear	y	y

Three other letters in Standard Arabic do not occur as such in Moroccan Arabic. They are realized in another way: t̲ (voiceless dental fricative) becomes t, d̲ (voiced dental fricative) becomes d, and ẓ (emphatic velarized z) becomes ḍ.

SUMMARY IN DUTCH

Opzet van de dissertatie

De dissertatie bestaat uit 7 hoofdstukken waarvan 4 analysehoofdstukken. De analysehoofdstukken behandelen achtereenvolgens de taalkundige onderzoeksdomeinen anaforische referentie (hoofdstuk 3), relatieve zinnen (hoofdstuk 4), topic continuïteit (hoofdstuk 5) en temporaliteit (hoofdstuk 6). De andere drie hoofdstukken bevatten de introductie (hoofdstuk 1), de opzet van het onderzoek (hoofdstuk 2) en de conclusies & discussiepunten (hoofdstuk 7). In het eerste hoofdstuk wordt achtergrondinformatie gegeven over tweetaligheid, de Nederlandse context, het NWO-zwaartepuntprogramma en ander onderzoek naar de ontwikkeling van tweetaligheid bij Marokkaanse kinderen. In het tweede hoofdstuk worden de onderzoeksdomeinen gepresenteerd en in een theoretisch kader geplaatst en wordt de keuze van deze domeinen verantwoord. De analysehoofdstukken behandelen ten eerste de opzet, afname en uitkomsten van de uitgevoerde taalexperimenten (anaforische referentie en relatieve zinnen) waarin de ***grammaticale competentie*** van de informanten wordt bestudeerd, en ten tweede de opzet, afname en uitkomsten van de verzamelde semi-spontane taaldata, waarmee de ***pragmatische competentie*** van de informanten wordt bestudeerd. In de analysehoofdstukken worden de resultaten van de tweetalige groep informanten gepresenteerd, waarna een vergelijking wordt gemaakt met de 2 controlegroepen: eentalige Nederlandse kinderen en eentalige Marokkaanse kinderen. In het laatste hoofdstuk worden de resultaten samengevat en worden, in bescheiden mate, suggesties gedaan voor verder onderzoek en worden eventuele implicaties van dit onderzoek voor het onderwijs besproken.

Overzicht van de resultaten

Anaforische referentie

Het begrip dat de informanten (4 tot 11-jarige Marokkaanse tweetalige kinderen) hebben van twee soorten anaforen is in een taaltaak bekeken. Het is een receptieve taak wat wil zeggen dat de informanten zelf geen (gesproken of geschreven) taal hoeven te produceren. Er worden 24 zinnen voorgelezen en na iedere zin moet de informant het plaatje aanwijzen dat volgens hem/haar bij de desbetreffende zin

hoort. Er is telkens keuze uit vier plaatjes en er is slechts één correct plaatje. Het gaat hier om het verschil tussen de anaforen 'zich' en 'hem', ofwel of een handeling gericht is op op degene die hem zelf uitvoert of niet. Ter illustratie volgen hier twee voorbeeldzinnen: 'de vriend van Martijn knijpt zich' en 'de vriend van Martijn knijpt hem'.

Op jonge leeftijd (4 tot 6 jaar) hebben de informanten hogere scores op items met 'hem' dan op items met 'zich'. Later (vanaf 6 à 7 jaar) draait dit patroon om, waarna er op een gegeven moment een punt komt waarop de informanten beide soorten zinnen begrijpen en een score halen die boven de 90% ligt. Voor de tweetalige informanten ligt dat punt op ongeveer 10 jaar, terwijl dat bij de eentalige Nederlandse en eentalige Marokkaanse informanten op ongeveer 8 jaar ligt.

Het feit dat er eerst betere scores worden behaald op items met 'hem' wordt verklaard vanuit de ontwikkelingstheorie dat jonge kinderen het woord 'hem' al verworven hebben en zelf gebruiken, hoewel misschien niet als anafoor zoals dat hier in de voorbeeldzinnen gebeurt, maar ze zijn al in het stadium waarin ze zich bewust worden dat 'hem' refereert aan een mannelijk persoon en op een ander georiënteerd is dan degene die een actie uitvoert.

Het feit dat er op latere leeftijd beter wordt gescoord op items met 'zich' wordt verklaard vanuit de generatieve grammatica waarin wordt uitgegaan van bepaalde universele regels die leerders van alle talen zich op een gegeven moment in hun ontwikkeling eigen zullen maken. Het leren begrijpen van wie bedoeld wordt met 'zich' is een positieve regel (het kan alleen maar naar de actor in de betreffende voorbeeldzin verwijzen) en het leren begrijpen van wie bedoeld wordt met 'hem' is een een negatieve regel (het kan niet naar de actor in de betreffende voorbeeldzin verwijzen, maar kan geen uitsluitsel geven over naar wie het moet verwijzen). Hierdoor worden, na het verwerven van deze regels, items met 'zich' makkelijker te begrijpen dan items met 'hem'.

Als op een gegeven moment de leerder op een zodanig cognitief en linguïstisch niveau komt dat beide regels volledig kunnen worden toegepast, komen de scores op beide soorten items tussen 85% en 100% te liggen. Dat punt ligt voor de tweetalige informanten in dit onderzoek op een hogere leeftijd dan voor eentalige.

Relatieve zinnen

Het begrip dat de informanten hebben van verschillende soorten relatieve zinnen is eveneens in een taaltaak bekeken. Ook dit is een receptieve taak. Er worden 32 zinnen voorgelezen en na iedere zin moet de informant deze naspelen met knuffelbeesten. Er is een grote hoeveelheid mogelijke handelingen die een kind kan uitvoeren naar aanleiding van het horen van de voorbeeldzin. Er is echter slechts één goede mogelijkheid: de twee handelingen in de zin met betrekking tot de juiste actoren (in dit geval beesten) in de juiste volgorde naspelen. Het gaat hier om het verschil tussen wie de handeling uitvoert en wie deze ondergaat. Ter illustratie volgen hier twee voorbeeldzinnen: 'de leeuwen die de beer kussen,

aaien de aap' en 'de leeuwen die de aap kust, slaan de beer'.

Er zijn vier verschillende zinstypen gebruikt als voorbeeldzinnen waarin aan de verschillende dieren in de zin ofwel de grammaticale functie van subject ofwel die van object wordt toebedeeld. Er is nagegaan of deze verschillende functies (op verschillende plaatsen in de zin) van invloed zijn op de resultaten. Gebleken is dat de belangrijkste factoren die een rol spelen bij het wel of niet goed begrijpen van deze zinnen gelegen zijn in de basisstructuur van de zin en in het gebruik van moeilijke grammaticale markeringen.

Het belang van de eerste factor blijkt vooral uit een analyse van verkeerd uitgevoerde zinnen: nadat bleek dat de scores op zinsdelen waarin het subject vooraf ging aan het object (zoals in niet-samengestelde zinnen in beide talen de gebruikelijke manier van doen is) zeer hoog waren en dat dat vooral het geval was bij de groep jonge informanten, is gekeken naar welke handelingen de informanten uitvoerden als ze het niet correct deden. De conclusie is dat de informanten in hun handelingen een zin realiseren die voldoet aan de regels van de basisstructuur van hun taal. Aangezien het Marokkaans Arabisch en het Nederlands in het geval van relatieve zinnen dezelfde basisvolgorde hebben, zijn de uitkomsten voor beide talen vrijwel identiek en treden er ook geen verschillen op tussen tweetaligen en eentaligen.

De tweede factor, het gebruik van moeilijke grammaticale markeringen, blijkt vooral uit de Marokkaans Arabische data. In die zinnen is er ook afgewisseld met woordvolgorde in de zin, iets wat voor het Nederlands niet mogelijk is. Wanneer in het Marokkaans Arabisch van de ongemarkeerde woordvolgorde SVO wordt overgegaan naar de gemarkeerde woordvolgorde OVS, moet dat met grammaticale markeringen worden aangegeven. Een co-referentiële index die verwijst naar het object moet als suffix aan het werkwoord worden gekoppeld, wat zinnen oplevert als (letterlijk vertaald): de aap bijt-*hem* de leeuw. In deze zin is de leeuw degene die bijt en de aap degene die wordt gebeten. Op deze Marokkaans Arabische zinnen wordt door de eentalige informanten in Marokko een veel betere score behaald dan door de tweetalige informanten in Nederland. Dit geeft aan dat de tweetalige informanten meer ingewikkelde zinnen die afwijken van de veelgebruikte basisstructuur en moeilijke grammaticale markeringen bevatten, minder snel en minder goed begrijpen dan hun eentalige leeftijdgenootjes. Deze laatste conclusie betreft alleen het Marokkaans Arabisch.

Topic-continuïteit

De semi-spontane taaldata bevatten verhalen die de informanten verteld hebben aan de hand van een boekje waarin 24 plaatjes voorkomen en geen woord geschreven tekst. Het gaat om een jongen en een hond die een kikker kwijt zijn en op hun zoektocht door het bos allerlei avonturen beleven tot ze de kikker uiteindelijk terugvinden. Voor de analyse van topic-continuïteit is gekeken naar hoe de informanten verwijzen naar de twee hoofdpersonen in het verhaal, de jongen en de hond.

Uit de resultaten blijkt dat de informanten al op vrij vroege leeftijd de

algemene regel 'introductie door middel van een zelfstandig naamwoord' verworven hebben en weten toe te passen: de eerste keer dat een hoofdpersoon genoemd wordt ('introduction'), gebeurt dit doorgaans door middel van 'een jongen', 'een hond', etc. Bij de eentalige informanten ligt dit punt op 4-jarige leeftijd en bij de tweetalige op 5-jarige leeftijd.

Ook wanneer er sprake is van wisselen van subject ('switch'), dat wil zeggen dat het subject in de vorige zin naar een ander persoon/karakter verwijst dan het subject in de huidige zin, wordt meestal gebruik gemaakt van een zelfstandig naamwoord. Bij de jongere informanten (4 tot 7 jaar) zijn die patronen minder duidelijk dan bij de oudere informanten (vanaf 8 jaar), maar de overgang van een weinig systematisch aandoend gebruik van pronomina en nomina door elkaar naar een duidelijke voorkeur voor nomina bij wisselingen, is onmiskenbaar, zowel bij tweetaligen als bij eentaligen.

Bij handhaving van subject referentie ('maintenance') wordt veel gebruik gemaakt van pronomina. In dit onderzoek is er sprake van handhaving wanneer het subject in de voorgaande zin hetzelfde is als het subject in de huidige zin. Voor de luisteraar is het niet nodig een nomen te horen ter identificatie van het subject. Het gebruik van een pronomen is dan even duidelijk en vaak om stilistische redenen voor de hand liggender.

Deze uitkomsten lijken nogal voor de hand te liggen en de conclusie luidt dan ook dat het leren navertellen van een verhaal en het overbrengen van de structuur die daarbij hoort, een vrij universeel proces is. Tegelijkertijd is ook gekeken naar de uitzonderingen op de gevonden regels. Ook daaruit blijkt dat er geen taalspecifieke verschillen zijn, maar veeleer verschillen die met de leeftijd te maken hebben, of met universeel geldende regels met betrekking tot het benoemen van personen/karakters in een navertelling. Op een aantal van die universalia wordt aan het eind van hoofdstuk 5 uitgebreid ingegaan. Wel zien we ook hier weer dat de tweetalige informanten een iets langzamer tempo hebben in het verwerven van deze regels dan de eentalige informanten uit de controlegroepen.

Temporaliteit

De semi-spontane taaldata die gebruikt zijn voor de analyse van topic-continuïteit, zijn ook gebruikt voor de analyse van temporaliteit. Voor temporaliteit hebben we gekeken naar het gebruik van de dimensies tijd en aspect. Daarnaast is aandacht besteed aan temporele adverbia die de informanten in hun navertellingen gebruikten.

Wat betreft het gebruik van tijd ('tense') is aangenomen dat het taalgebruik van de informanten zich naarmate hun leeftijd vordert, zal ontwikkelen in de richting van dat van volwassenen. Volwassenen vertellen over het algemeen in het Marokkaans Arabisch en in het Nederlands verhalen alsof die in het verleden hebben plaatsgevonden (in het Nederlandse 'tense'-systeem) ofwel afgesloten zijn (voor het Marokkaans Arabische 'tense'-systeem). Bij de oudere informanten in dit onderzoek zien we inderdaad dat ze meer en meer gebruik gaan maken van

werkwoordsvormen die naar het verleden verwijzen. Bij de jongere informanten is dit patroon minder duidelijk: daar zijn meer verhalen met door elkaar lopende werkwoordstijden en verhalen in de tegenwoordige tijd. Ook hier lijkt deze ontwikkeling zich bij de eentalige informanten op een jongere leeftijd af te spelen dan bij de tweetalige informanten.

Het gebruik van aspect is een ingewikkeld gegeven. De mogelijkheden in verschillende talen om aspect uit te drukken, verschillen meestal zodanig van elkaar dat cross-linguïstische vergelijking een moeilijke zaak wordt. Het is daarom voor de hand liggender vergelijkingen te maken tussen tweetalige en eentalige informanten dan tussen het Marokkaans Arabisch en het Nederlands, temeer omdat het Nederlands niet een erg uitgebreid aspectueel systeem heeft. In het Marokkaans Arabisch blijken de jongere informanten de neiging te hebben bepaalde vormen te overgeneraliseren, terwijl de oudere informanten een evenwichtiger verdeling laten zien in het gebruik van alle vormen die de taal hen biedt. Deze evenwichtige verdeling is bij de eentalige informanten nog duidelijker dan bij de tweetalige.

Er is een fors verschil tussen de tweetalige informanten en de eentalige ten aanzien van het gebruik van temporele adverbia. De eentalige informanten maken gebruik van een veel geavanceerder repertoire dan de tweetalige. Dit geldt voor beide talen. De eentalige kinderen maken veel minder gebruik van temporele adverbia die de gebruiker noodzaken af te wijken van de natuurlijke chronologische volgorde in een vertelling, of die de gebruiker noodzaken tot complexe morfologische aanpassingen.

Algemene conclusies

Wat ***grammaticale competentie*** in het Nederlands betreft, verschillen de tweetalige kinderen niet sterk van de eentalige kinderen: de *volgorde* van verwerving van de grammaticale regels die nodig zijn voor het correct uitvoeren van de experimentele taken, vindt op vergelijkbare wijze plaats. Er is zelfs, vanaf de leeftijd van 5 jaar, niet veel verschil in *tempo* meer te merken tussen de verschillende groepen. In het Marokkaans Arabisch zien we wel een verschil tussen tweetalige en eentalige informanten, namelijk daar waar het de verwerving van zeer complexe relatieve zinnen betreft. De eentalige kinderen blijken beter in staat die te analyseren dan de tweetalige kinderen. Na zo'n 4 à 5 jaar in het Nederlandse schoolsysteem zijn de tweetalige Marokkaanse kinderen dominanter in hun tweede taal (T2) dan in hun eerste taal (T1). Daarbij scoren ze in de T2 vergelijkbaar met eentalige Nederlandse klasgenootjes en in de T1 scoren ze lager dan eentalige Marokkaanse kinderen, waar het een ingewikkeld grammaticaal aspect bij relatieve zinnen betreft (ongemarkeerde woordvolgorde in plaats van gemarkeerde).

Bij het bestuderen van ***pragmatische competentie*** zien we dat op het eerste gezicht de tweetalige kinderen even vaardig lijken als de eentalige kinderen; het

verschil in *tempo* is ook hier alleen de gedurende de eerste twee jaren duidelijk. Bij nadere analyse blijkt echter dat de tweetalige kinderen minder uitgebreid gebruik maken van een aantal taalkundige middelen dan de eentalige kinderen. De tweetalige kinderen maken minder gebruik van ondergeschikte zinnen en beperken zich in hun keuze van bijwoorden en voegwoorden tot een klein aantal dat veelvuldig wordt gebruikt. Hier zien we het verschil tussen tweetalige en eentalige kinderen niet kleiner worden over de periode die het onderzoek beslaat. Er is in dit opzicht dus niet alleen verschil in tempo, maar ook in *structuur* van taalverwerving.

Curriculum vitae

Petra Bos was born in 1965 in the Netherlands. She studied Arabic language and literature at Leiden University in the Netherlands, at Cairo University, Egypt and at Mohamed V University in Rabat, Morocco. She received her M.A. from Leiden University in 1990 and started her Ph.D. research at Tilburg University. She currently works at the Faculty of Arts of Tilburg University for the recently developed M.A. programme *Arabic in Europe*. Besides that, she is also the secretary of the inter-university Tilburg/Nijmegen research school *Center for Language Studies*.

Development of bilingualism reports on both first and second language development of Moroccan children living in the Netherlands. Linguistic data were collected over a period of several years from about fifty bilingual Moroccan children at age 4 to 10. These children performed a number of different linguistic tasks and thus provided a large and valuable data-set.
In discussing the results of these tasks, attention is given to differences and similarities noted in performance in the first and the second language, and in the performances of the bilingual group and the two monolingual control groups (one Dutch and one Moroccan).

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