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Verb inflection as a diagnostic marker for SLI in bilingual children

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Dedication

I dedicate this thesis to my mother, Daisy Doran. This achievement is a reflection of your prayers, love, motivation, time, endurance and dreams.

Foreword/Acknowledgements

Eleven years ago I moved to the Netherlands to acquire a Bachelor's Degree in Speech Therapy. After graduating with my degree in Speech Therapy, I worked as a Speech Therapist in the Netherlands helping children and adults with Speech and language impairments.
It was always a goal of mine to further increase my knowledge in this particular field. So I decided to pursue my pre-masters in Speech and language pathology at the Radboud University in Nijmegen. The transition from a working therapist back to a student was a tough process, but through my faith in God, I was able to make it. After attaining the pre-masters, I was more determined than ever to acquire a Master's degree in Speech and language pathology, and so I began my journey in pursuit of this degree.

Almost two years ago I started writing my Master's thesis on Verb inflection as a diagnostic marker for SLI in bilingual children. When I was first introduced to the subject of my thesis, my interest for the subject was instant. I had always been interested in matters concerning bilingualism since many of the clients that I had treated were bilinguals. In addition, I also happen to be bilingual and would have liked to gain more knowledge on matters concerning this particular group.

Many students have stated that writing a thesis is a long and difficult journey. This was unquestionably true, in my case. It was a long and mentally tiring process, but nevertheless educational and gratifying in the end.

I will like to sincerely thank my thesis supervisor Professor Dr. Roeland van Hout for his patient, guidance, and knowledge, which were vital in helping me write this thesis.
Furthermore, I will like to thank Drs. Manuela Julien for providing the research data that formed the basis of my thesis.

I would like to acknowledge, great thanks and appreciation to my parents Ronald and Daisy Doran, my Aunt and friends for all their support and encouragement during this process.

Abstract

The aim of this study was to investigate whether successive bilingual children with specific language impairment (age 5;0-8; 11) differ from unimpaired bilingual children (age 5;0-8;8) in their use of the 3rd sg present tense (3 rd sg). Previous research has suggested that the omission of the 3rd sg agreement affix (-t) is a possible diagnostic marker of SLI in bilingual children (Steenge 2006, Verhoeven et al. 2011). It is the expectation that successive bilingual children with specific language impairment (N=27) omit the 3rd sg more frequently than the unimpaired successive bilingual children (N=25). In order to investigate this expectation, the outcomes of two production tasks were analyzed: the completion task and the narrative task.

The performance of the children on the completion task confirmed that successive bilingual children with SLI omit the 3rd sg agreement marker (-t) significantly more often than unimpaired successive bilingual children. However, no effect of SLI was found in the narrative task. This difference between the two tasks was possibly caused by a task effect. Furthermore, no age effects were found in the two tasks. The mid young successive bilingual children (SLI and UI) did not produce the 3rd sg agreement marker significantly more frequently than the young successive bilingual children (SLI and UI). There was a positive and significant correlation between the narrative and the completion tasks. In addition, the results pointed out that the participants performed better in the narrative task than in the completion task. Although an effect of SLI was found for the production of the 3rd sg in the completion task in, the results of this present study were not strong enough to meet the requirements of a diagnostic marker of SLI.

Moreover, there were three relevant observations on individual differences among participants in this study: (1) the occurrence of very high correct percentage scores among bilinguals with SLI, (2) the production of substantial amounts of unclassifiable responses with auxiliaries and (3), lastly, more unclassifiable responses were produced in the narrative task than in the completion task. The latter two observations were possibly a result of task complexities.

Table of content

1. Introduction

According to the (CBS 2016) data, persons with a foreign background constitute 21% of the population in the Netherlands. Data also indicates that The Turkish and Moroccans form the largest minority groups in the Netherlands (CBS 2016). Blom (2009) concludes that more than 20% of children in the Netherlands have at least one parent of a foreign background, which implies that a substantial percentage of children in the Netherlands will grow up hearing and learning two or more languages and will probably acquire Dutch as a second language. Futhermore, Armon-Lotem et al. (2015) found that 24% of the Dutch school population consists of bilingual children. Due to the increasing growth of bilingual children in the school population, speech therapists are given the task of testing and diagnosing bilingual children whose language proficiency level is not equal to that of their typically developing monolingual peers. Testing and diagnosing this group of children for SLI is a rather complex task. Far too little attention has been paid to the manifestation of SLI in bilingual children (Steenge, 2006; Armon-Lotem et al. 2015). Research investigating the classification of children with specific language impairment (SLI) has primarily focused on monolingual children with SLI. Only a limited amount of standardized diagnostic tests are available for bilingual children with SLI and speech therapists lack the knowledge of the SLI characteristics in non-Dutch languages (Julien, 2009). Every study reported difficulties in distinguishing bilingual language errors from SLI errors (Blom, 2009). This opinion is also supported by Orgassa (2009) who concluded that bilingual children might display language errors in their second language that bear a resemblance to language errors made by children with SLI. These results are both evident in the misdiagnosis of bilingual children with SLI who do not receive and that misdiagnosis of bilingual children without SLI who receive therapy (Blom 2009; Paradis, 2010; Armon-Lotem et al. 2015).

In addition, data results from several studies across languages have frequently shown that the production of subject-verb agreement is affected by SLI (Clahsen et al., 1997; Rothweiler et al., 2010; Leonard, 2009, 2014). In a cross-linguistic investigation of SLI in monolingual English-speaking SLI children and monolingual German speaking SLI children, Clahsen et al. (1997) found that both groups acquired low scores on subject-verb agreement. Rothweiler et al. (2010) found similar results in their investigation of the subject-verb agreement in monolingual German speaking SLI children and bilingual German-Turkish speaking SLI children. Dutch studies on SLI consistently show that both monolingual and bilingual SLI children have difficulties with the production of subject-verb agreement (Orgassa, 2009; Spoelman et al., 2012). In Dutch, these difficulties may manifest itself as the absence and/or substitution of the agreement marker (de Jong, 1999), such as the absence of the 3rd sg aagrement marker –t (see (1) or the substitution of the plural agreement marker by a singular marker (see (2).

(1) Hij speel met de bal (bare stem). *Instead of:* hij speelt (3rd sg -t)
He play with the ball. *Instead of:* He plays with the ball (3rd sg -s)

(2) Het meisje en haar vriendin speelt met de bal (3rd sg -t). *Instead of:* spelen (i)
The girl and her friend plays with the ball (3rd sg -s*). Instead of:* The girl and her friend play with the ball.)

As a result of these difficulties in the area of subject-verb agreement, researchers have suggested that the subject-verb agreement can be seen as a prominent diagnostic marker of SLI (de Jong, 1999; Armon-Lotem et al., 2015). Thus far, there have been several studies in search of possible diagnostic markers of specific language impairment in bilingual children with SLI (Clahsen, 1989; Paradis et al., 2003 Verhoeven et al., 2011). Verhoeven et al. (2011) conducted a Dutch study on verb morphology as a diagnostic marker of SLI; this studyI suggested that an omission of the affixing 3rd sg agreement marker (-t) can be seen as a diagnostic marker for SLI in both monolingual and bilingual children. In conclusion, the content presented in this thesis attempts to find a diagnostic marker of SLI in bilingual children in the domain of subject-verb agreement with a main focus on the 3rd sg agreement marker (-t). There are three primary research objectives of this study:

1. To investigate if successive bilingual children with SLI have difficulties in producing the 3rd sg agreement marker in an obligatory context.

2. To investigate if there is a significant difference between successive bilingual children with SLI and unimpaired successive bilingual children in producing the 3rd sg agreement marker in an obligatory context.

3. To investigate if age has a significant impact on successive bilingual children in producing the 3rd sg agreement marker in an obligatory context and if age has the same impact on successive bilingual children with SLI and unimpaired successive bilingual children progress.

1.1. Specific language impairment : the monolingual context

Specific language impairment (SLI) is viewed as a disorder distinct from other disorders. It is a 'primary deficit in linguistic abilities and language development' (Bishop, 2000). SLI has been defined by exclusionary and inclusionary criteria as the following: The exclusionary criteria requires typical development and normal behavior in other areas than language, such as hearing, speech, non-verbal intelligence, mental abilities, sensory-motor skills, social skills and physical abilities (Leonard 1987, 1998). The inclusionary criteria are quite straightforward: there is a significant deficit in the language ability. Bishop (1992) states that 'Specific language impairment is diagnosed where there is a failure of normal language development that cannot be explained in terms of mental or physical handicap, hearing loss, emotional disorder or environmental deprivation' (p. 3). Children with SLI have limited linguistic abilities in the production and/or comprehension of language. They can have a deficit within different linguistic domains (Leonard, 1998) such as the lexical, syntactic, semantic, morphological, phonological and pragmatic domains (Schaeffer, 2003). Consequently, this group consists of a very heterogeneous population (de Jong et al., 2007). Not all linguistic domains of SLI children are impaired or equally impaired. English-speaking SLI children regularly omit and/or substitute tense-marking morphemes, agreement morphemes and other functional elements, such as auxiliaries and use fewer grammatical morphemes in obligatory contexts (Leonard, 2000). In the Netherlands, SLI children experience great difficulties in the domain of agreement (de Jong, 1999; Wexler et al., 2004). As previously mentioned, bilingual children's linguistic abilities and language development may resemble that of children with SLI (Orgassa 2009; Armon-Lotem et al., 2015), which makes it difficult to distinguish bilingual language errors from SLI errors (Blom, 2009). It is quite obvious that the circumstances of SLI bilingual children are more complex than that of SLI monolingual children (see subsection 1.3.)

1.2. Bilingualism

For reasons of convenience, it has become common practice to use the term "bilingualism" to embody and include both the terms bilingualism and multilingualism. The term "bilingualism" may have a different meaning to different people. In other words, there is no single definition of the term. Bloomfield (1933) defined the term as "native- like control of two languages." This definition demands a strict requirement in terms of language proficiency, while others like Schach et al., (1958) take the opposite view that "bilingualism" should be characterized by minimal rather than maximal language proficiency. Schach et al. (1958) defines the term as simply knowing two languages, the degree of language proficiency being irrelevant. Weinreich (1953) takes a more neutral position in defining bilingualism as "the practice of alternatively using two languages." Bilingual children rarely

develop both languages equally (Leist-Villis, 2008). In general, one language is stronger than the other (Ng & Wigglesworth, 2007). There are two ways in which a child may become bilingual: they can develop the second language "simultaneously" or "successively". These two terms are used to classify bilingualism by the age of language acquisition, the manner of acquisition and the amount of exposure to the second language. Simultaneous bilingualism (2L1) is the form of bilingualism that occurs when children are equally and regularly addressed in both languages from birth and onwards (De Houwer, 1995; Sanders, 2009). Successive bilingualism (L2) is the form of bilingualism that occurs when children first establish a basic knowledge of the first language (L1) and at an older age learn the second language (L2) (Çavuş-Nunes et al., 2006; Steenge, 2006; Orgassa, 2009). In other words, a child becomes bilingual by first acquiring one language and then another. It is imperative that simultaneous bilingualism (2L1) and successive bilingualism (L2) are distinguished from one another when investigating the differences and similarities in bilingual childhood acquisition. The participants in this thesis are successive bilinguals (L2), which is why simultaneous bilingualism (2L1) will not be discussed in more detail.

1.2.1. Acquisition (L2)

Successive bilinguals also known as sequential bilinguals (L2) develop one language(L1) from birth and at an older age acquire a second language (L2) (Orgassa, 2009). According to Sanders (2009), the child can verbally communicate in one language before acquiring the second language. The acquisition of the second language usually occurs between the ages three or four up to seven (Orgassa, 2009). In contrast to monolingual children, bilingual children (L2) have a previous comprehension of the first language (L1), which may influence the development and the production of morphosyntax in the second language (L2) (Verhoeven, 1994; Blom et al., 2013). This view is supported by Cummins (1979, 1981, 1991) in the interdependency hypothesis. This hypothesis suggests that "the dominant language of bilingual children may influence the non-dominant language under the conditions that exposure to that non-dominant language is adequate and that there is a motivation to learn that non-dominant language" (Verhoeven et al., 2012: 177). Successive bilingual children (L2) develop their second language (L2) differently from their first language. According to Schwartz et al. (2003), the essential parts of the first language (L1) grammar is in place between the ages of three and seven, which allows the children to transfer their knowledge of their first language (L1) to develop their second language (L2). This perspective has been adopted by Verhoeven et al. (2012), who write: "second language learners do not need to relearn the basic categories of language. Taking the analyzed system of the first language as a starting point, they only have to learn the language-specific devices of the new language" (p.177). Furthermore, second language learners skip the babbling phase which is necessary for the early stages of language development in the first

language (L1) and begin directly with two- or three-word sentences (Çavuş-Nunes et al., 2006). MacWhinney (1992) suggest that L2 learners adopt a range of tactics from the L1 acquisition that can be easily transferred to the L2 learning development/procedure. Furthermore, an investigation of the L1 and L2 proficiency of 75 Turkish–Dutch bilingual children with SLI by Verhoeven et al. (2012) found that the bilingual children's L1 proficiency levels could explain their L2 proficiency levels. As a result, it was concluded that there is a correlation between the formal linguistic skills of the bilingual children's L1 and L2. Furthermore, the implication is that the level of L1 proficiency might help to develop linguistic skills in L2.

1.3. Specific language impairment: the bilingual context

Traditionally, research investigating the classification of children with specific language impairment(SLI) has focused on monolingual children with SLI. In recent years, there has been an increasing amount of interest and research into the classification of bilingual children with specific language impairment (SLI). As previously mentioned monolingual SLI children's language development is delayed in comparison to other aspects of their development such as non-verbal intelligence, motor, social and emotional skills (Bishop, 1997; Leonard, 1998). This is also the case for SLI bilingual children, who exhibit delays in the first as well as the second language (Restrepo & Kruth, 2000; Paradis, 2007). Bilingual children cannot be diagnosed with SLI if there is only a language delay in the first language or the second language. The identification of SLI in bilingual children is quite a challenging task. Previous English studies comparing bilingual children with SLI to monolingual SLI children reveal that bilingual children with SLI exhibit morphosyntactic problems more often than their monolingual peers (Crutchley et al., 1997, Crutchley 1999). Based on the outcomes of these studies it can be concluded that the language difficulties of bilingual children with SLI are more multifaceted and persistent than that of their monolingual SLI peers. Paradis et al. (2000) analyzed the morphosyntax (tense morphology and agreement morphology) of 7-year-old English-speaking L2 learners of French and French-speaking children with SLI. Their analysis revealed that there are significant similarities in the error patterns of L2 and SLI children. Studies comparing bilingual children with SLI with their typically developing (TD) bilingual peers show that their grammatical development level and their development speed were slower than their typically develop (TD) bilingual peers (Håkansson et al., 2003, Salemeh et al., 2004). It has been found in several Dutch studies (Steenge 2006; de Jong et al., 2007; Orgassa 2009), that difficulties in agreement morphology are a typical characteristic of both monolingual and bilingual children with SLI. Steenge (2006) found that bilingual children with SLI perform poorer in their second language than monolingual children with SLI in the same language. Using data from Steenge's study Verhoeven et al., (2011) to investigate the use of verb morphology in the narratives of 7 and 9 years old native Dutch

(monolingual) unimpaired children, it was concluded that unimpaired bilingual children, native Dutch (monolingual) children with SLI, and successive bilingual children with SLI did worse when measured by number of ungrammatical utterance's and length of utterance's. Since a main effect of bilingualism and SLI was present, it was concluded that bilingual children with SLI have an additional disadvantage as far as their actual usage of the second language verb morphology is concerned.

1.4. Thesis Layout

The thesis is composed of seven chapters. Chapter 2 begins by laying out the theoretical dimensions of Dutch subject-verb agreement. It describes the Dutch subject-verb agreement in monolinguals with SLI and unimpaired bilinguals as well as SLI bilinguals. Chapter 3 outlines the procedures and methodology used in this thesis. It contains a detailed description of the participants, research tasks, data collection, data scoring and analysis. The Chapters 4 to 6 present the findings of the research tasks, focusing on the 3rd sg. The final chapter consists of the discussion and conclusion. In this chapter, the findings of the research task are explained and connected to the literature and other studies.

2. Theoretical background

2.1. The subject–verb agreement

Subject-verb agreement is a grammatical rule, by which a verb is marked for the grammatical features of the subject in a sentence (de Jong, 1999, 2010; Steenge, 2006). Grammatical features refer to first, second, or third person, to singular or plural (number) and, in some languages, to male or female (gender). The subject in a sentence typically is a noun or pronoun. Agreement markings may also provide information on tense (Spoelman et al., 2012). For instance, the 3rd sg (s) suffix in English verbs is solely used for the present tense. In many languages, the agreement is dictated by the syntactic context in which the verb is used (Booij, 2002; de Jong, 2010). In Dutch, the verb is in agreement with the subject's person (Vikner, 1995) and with the subject's number (Hartsuiker et al., 2006). With respect to the morphological complexity, the Dutch agreement paradigm can be classified/categorized between English and German. The Dutch agreement paradigm is less complex than that of German and more complex than that of English (Booij, 2002; Blom et al., 2013).

2.2. The Dutch verbal paradigm

Dutch is defined as a Subject-Object -Verb/ Verb Second (SOV/V2) language (Koster, 1975; Wijnen et al., 1998; Blom et al., 2013). This means that there are two positions for verbs in Dutch sentences: the finite verbs (i.e., verbs that express tense and agreement) take the sentence final position, but in main clauses, the finite verb moves to the second position of the sentence (Polišenská, 2010).

Dutch finite verbs are marked for tense, number and person. As previously mentioned the finite verb form in which the inflection appears, has to agree with the subject of the clause in person and number. Dutch regular lexical verbs have a stem, to which a suffix is added. The Dutch verb agreement inflection in the present tense is highly regular. It has three different forms: stem, stem+t and stem+en. The choice of the accurate tense inflection is not determined by the syntactic structure, which is why it is usually not considered part of agreement inflection (Booij, 2002). In Table 2.1 the Dutch regular agreement paradigm is illustrated for the verb *werken* ('to work').

Table 2.1: Dutch finite verbal paradigm for regular verbs in present tense

Present tense					
Person & number		**Suffix/Inflection**	**Werken(stem.INF)**		**'to work'**
1sg	ik	stem(ø)	Werk	I	work
2sg	jij	stem-t	werk-t	You	work
3sg	Hij/zij	stem-t	werk-t	He/she	work-s
1pl	wij	stem- en	werk-en	We	work
2pl	jullie	stem-en	werk-en	You	work
3pl	zij	stem-en	werk-en	They	work

Not only does the zero (ø) marking of the verb illustrate the stem form, but it also represents the 1st person singular (1sg) and in sentences with a VS structure the 2nd person singular. The suffix (t) is added to the stem to mark both the 2nd person singular (2nd sg) and 3rd person singular (3rd sg). With the plural forms 1st pl, 2nd pl and 3rd pl, the suffix (en) is added to the stem. At a certain point in their language acquisition children have to learn these Dutch suffixes and accurately apply them to the verb stems.

2.3. Subject–verb agreement acquisition: L1 learners of Dutch

As previously mentioned, the subject-verb agreement is computed by grammatical rules (Pinker et al., 1988; de Jong, 1999, 2010; Steenge, 2006). At a certain point in language acquisition children should be able to apply these grammatical rules accurately in obligatory contexts. It is quite difficult to indicate at what age children master agreement. According to Wexler's (1998) hypothesis of Very Early Knowledge of inflection (VEKI) children are 'little inflection machines'. Children seem to have the knowledge of the grammatical rules and phonological features of morphological inflection from the start of their language production. Children as young as 2;4 have been found to be quite good in determining the correct inflection (Polišenská, 2010). According to Blom & Wijnen (2013), Dutch children start to use the subject-verb agreement more efficiently in spontaneous speech around age 2;6. They differentiate the different agreement marking morphemes and use agreement marking with a wider range of verb types (Blom et al., 2013). In a study investigating the acquisition of verbal inflection in 46 Dutch three-to-six-year-olds Polišenská (2010) found that the majority of children performed target-like at the age of three. Importantly, it should be noted that at this early stage Dutch children's agreement marking has not been fully mastered (Schlichting, 1996; Wijnen et al., 1998; Blom, 2003).

With regard to the acquisition of the 3rd sg Polišenská (2010) found that Dutch 3-year-old children are highly accurate with their use of the 3rd sg in an obligatory context. Specifically, Polišenska (2010) found that the accuracy scores were 88% for the 3rd sg marking existing verb and 100% for 3rd sg marking nonsense verbs. In addition, she found high accuracy scores for the 3rd sg marking of existing verbs for older Dutch children: the accuracy scores were 89%, 95% and 100 % for four, five and six-year-old Dutch children. Furthermore, the accuracy scores were 82%, 100% and 100 % for four, five and six-year-old Dutch children for the 3rd sg marking of nonsense verbs. These high accuracy scores of the 3rd sg marking of both existing verb and nonsense indicates that Dutch children's production of the 3rd sg morpheme is productive at the age of 3 years and that the accuracy of the 3rd sg marking existing verbs gradually improves with age. Many researchers concluded that subject-verb agreement develops gradually and consist of three distinctive stages (Wijnen et al., 1998; Blom, 2003): (1) infinitival stage, (2) lexical-finite stage and (3) optional infinitive stage.

Infinitival stage

In this first stage of grammatical development, Dutch children produce two- or three-word utterances containing a single verb, which lack finiteness (Polišenská, 2010). The verbs often appear in the infinitive form and take the sentence final position (Wijnen et al., 1998; Blom, 2003; Orgassa, 2009).

Lexical-finite stage

This second stage of grammatical development marks the onset of subject-verb agreement (Blom, 2003; Zwitserlood, 2007). The verb types (modal auxiliaries and lexical verb) in this stage are marked for finiteness, and other verbs remain infinitival (Wijnen et al., 1998; Zwitserlood, 2007; Polišenská, 2010). In this stage, children learn that the verb has to agree with the subject and that the inflected verb moves to the second position. Dutch children's usage of the subject-verb agreement becomes more efficient in spontaneous speech production. They are able to differentiate the different agreement marking morphemes and use agreement marking with a wider range of verb types (Blom et al., 2013). Evidence from a study investigating the acquisition of verbal inflection shows that Dutch children produce two types of errors during the acquisition of agreement: they inaccurately use the singular markers (ø) and -t in plural contexts, they omit -t in 2nd sg and 3rd sg context and insert –t in 1st sg contexts (Polišenská, 2010). These findings are similar to Blom's (2003), who found that Dutch children under the age of three omit –t in different singular contexts.

Optional infinitive stage

During this stage of grammatical development, Dutch children freely alternate between the infinitive form and finite forms of lexical verbs (Blom & Wijnen, 2013). In addition children also form finite sentences by using auxiliaries, most often with the "dummy" verb *doen* (`to do') or gaan (`to go') (Zwitserlood, 2007). According to Zwitserlood (2007) the optionality lies in the child's use of either the infinitives, finite forms or auxiliary + infinitive combination.

2.4. Subject–verb agreement: Dutch L1 learners with SLI

In Germanic languages like English, Dutch and German, agreement and tense seems to be a vulnerable area for children with SLI (Rice et al., 1996; de Jong, 1999, 2003). The degree to which these vulnerabilities occur with agreement depends on the typology and the verbal paradigm of the language being acquired. Children with SLI acquiring a Germanic language are known to produce errors occurring in subject-verb agreement. The omission of finiteness markers of verbs is seen as the primary error type in Germanic languages (de Jong, 1999; Leonard, 2000; Orgassa, 2009; de Groot, 2016). This is however not always the case with Dutch SLI, as substitution errors can also be found (de Jong, 1999). De Jong (1999) revealed in an investigation on Dutch SLI, that the SLI children (average age 7) produced significantly more subject-verb agreement errors than their age-matched typically developing peers (TD) and typically developing children who were approximately two years younger than them. The SLI children accurately used the 3rd sg (stem+t) in 61% of its obligatory context, which is much lower than the 89% and 87% accuracy of their age-matched TD group and younger TD group. Furthermore, de Jong (1999) observed three error types in Dutch SLI:

1. omission of finiteness markers for 2nd, 3rd sg and plural forms, consequently producing the stem
2. substitution error (stem+t) as substitution for the plural forms
3. infinitives in the sentence-final position, without a preceding auxiliary.

These error types are similar to those of young unimpaired children (see Polišenská, 2010). Several theories have been developed to account for the grammatical symptoms of SLI. According to Marinis (2011) these theories can be categorized into two groups:

1) theories that suggest that SLI is caused by a deficit in the linguistic representation
2) theories that suggest that SLI is caused by a deficit in processing capacity.

The first group of theories argues that SLI is a disorder that affects one's ability to learn a language on a linguistic level. According to Clahsen's **Grammatical Agreement Deficit hypothesis** (Clahsen 1989, 1992, Clahsen et al., 1997)**.** children affected by SLI lack insight in the agreement relationship. They seem to have no control of subject-verb agreement relationship (de Jong, 2003). Gopnik's (1990) **Missing Feature hypothesis** suggests that SLI children lack knowledge of grammatical features like number, person, tense, and gender, which must be grammatically encoded (de Jong, 2003). In a revised account of this hypothesis Gopnik & Crago (1991) proposed that there is a deficit in the rules that assign the features to grammatical morphemes and that those rules are inaccessible to SLI children (de Jong, 2003).

The second group of theories argues that SLI affects one's ability to process and analyze language rules/facts in the input. According to the **Generalized Slowing Hypothesis** (Kail, 1994), limitations of processing capacity account for slower processing of linguistic and non-linguistic information which attests for the linguistic and non-linguistic deficit in SLI children. Their ability to learn grammatical rules are intact but they have difficulty perceiving and processing these rules in the language input (Miller et al., 2001); their intake of language input is not optimal (Weerman et al., 2011). Thus, there is a need for a relatively large amount of language input for SLI children in order to learn the necessary grammatical rules (Weerman et al., 2011). Linguistic structures such as subject-verb agreement and other grammatical elements can benefit from additional input (Leonard 1998; Orgassa 2009). There have been several studies that support this last theory (de Jong, 1999; Orgassa, 2009; Weerman et al., 2011).

Let us return briefly to the revised **Missing Feature hypothesis and Agreement Deficit hypothesis** in the first group. If we were to consider these hypothesis true, SLI children when tested would not score above-chance-level. Several Dutch studies have shown that this is not the case for SLI children, as they clearly score above chance level (de Jong, 1999; Orgassa, 2009; Weerman et al., 2011). Weerman's et al. (2011) investigation of Dutch agreement in SLI and unimpaired children showed no evidence that would suggest that the SLI children did not acquire the Dutch verbal paradigm. As previously mentioned their scores are too high (above chance level). The young SLI children (4;0-5;11) in this study attained a correct score of 80% for existing verbs and a correct score of 73% for nonsense verbs; the older SLI children (12;3-13;3) attained a correct score of 95% for existing verbs and a correct score of 85% for nonsense verbs. Interestingly, the older SLI children did not score 100%, a performance score that unimpaired children have at the age of 6;0 years (Polišenská, 2010). On the basis of these findings, it was concluded that there is a control problem due to the limitations in the processing capacity. These control problems may possibly affect a child's ability to analyse and aquire rules of a language from the input, to aquire other aspects of

language, and lastly to implement the rules that have already been acquired (Weerman et al., 2011).

The above-mentioned findings and theories lead me to the conclusion that SLI children do acquire the grammatical rules, but limitations in the processing capacity prevent them from applying these rules. Bishop (2000) suggests that SLI children performance scores are dependent on the complexity of the task. As the complexity of the task increases, they may have increasing difficulties applying the rules. Instead of being applied naturally and easily like in unimpaired children, the rule is fragile in SLI children and will only be applied when the language system is not greatly taxed with other demands (Bishop, 2000). This may account for the above chance levels scores during testing. It explains why children and adults who appear to have recovered from SLI can still perform poorly when taxed with a specific task that contains high information load (Bishop, 2000).

Errors in SLI children resemble those of much younger unimpaired children, indicating a delay in aquiring the dutch verbal paradigm. SLI children differ from their unimpaired peers in the amount of errors produced, the length of the time period in which the errors occur and the pace of language acquisition. (de Jong, 1999; Polišenská, 2010; Orgassa, 2009; Weerman et al., 2011).

2.5. Subject–verb agreement acquisition: L2 learners of Dutch

Considering the aspects of SLI mentioned in paragraph 2.3 and the assumption that SLI children have a poorer language intake than their unimpaired peers. SLI children are comparable to unimpaired successive bilingual children (L2), whose language intake is also assumed to be poorer than that of their unimpaired monolingual peers(L1) (Orgassa, 2009; Weerman et al., 2011). Similar to SLI children, L2 children are exposed to the target language within the critical age period. They differ, however, in the actual cause of the reduced language intake. Unlike SLI children, whose poor language intake is caused by a deficit in the processing capacity, L2 children poor language intake is directly related to their uneven exposure to L2 and their later start in acquiring L2 (Orgassa, 2009; Weerman et al., 2011).

L2 children's uneven exposure to the second language does not necessarily result in a language development delay in L2 since grammatical rules of agreement can be acquired fairly quickly without many errors and without requiring a relatively large amount of language input (Blom et al., 2006; Orgassa 2009). On the other hand, if the goal for a particular grammatical rule is not easily attained, consequently requiring a large amount of language input, the development delay in L2 is comparable to SLI (Orgassa, 2009). Like child L1 learners, child L2 learners are exposed to the target language within the critical age period (Blom et al., 2006), but they do not learn Dutch from birth and it is their second language (Blom, 2007). Despite their later start in the acquisition of Dutch, unimpaired L2 Dutch children go through the same development stages as unimpaired L1 Dutch

children in the acquisition of agreement (Blom et al., 2007; de Jong et al., 2007). According to de Jong et al., (2007), both groups quickly acquire the rules of subject–verb agreement at a young age and make the same substitution patterns over a short period of time in their language development. Dutch L1 children begin their acquisition of subject–verb agreement around the age of 2;0 (Polišenská, 2010). Whereas Dutch L2 children start their acquisition only when they are first exposed to Dutch, possibly around the age of 3;0 when they attend a playschool, or around the age of 4;0 when they attend primary school (Blom et al., 2006; Steenge, 2006). Assuming that the critical period ends around the age of 6;0-7;0 (Blom, 2007), child L2 learners like child L1 learners of Dutch are expected to accurately apply the grammatical rules of subject–verb agreement at this age. Blom's (2007) investigation of the subject-verb agreement in child L2 learners of Dutch revealed that Turkish-Dutch children between ages 5;0 to 8;0 accurately used subject-verb agreement in 83% of the cases (n=260) and Moroccan-Dutch children in 85% of the cases (n=485). Furthermore, nonsense verbs were accurately inflected in 78% (n=67) and 82% (n=127) of the cases. In reference to 3rd sg, Turkish-Dutch children showed an accuracy of 75% and Moroccan-Dutch children an accuracy of 85% in existing verbs. In addition, the Turkish-Dutch children incorrectly used the 1st sg (verb stem) in a 3rd sg context in 10% of the cases and Moroccan-Dutch children in 7% of the cases. Taking into consideration that some of the L2 child learners are still in the critical age period may account for the low percentages. De Jong's et al. (2007) investigation found that Turkish-Dutch children with an average age of 6;7 attained an accuracy of 92% correct usage of the subject-verb agreement.

As previously stated, unlike L1 learners L2 Learners are vulnerable to L1 transfer. This refers to the automatic transfer of the grammatical structure of the native language (L1) to the grammatical structure of the second language (L2) especially in the early stages of second language acquisition (Orgassa, 2009). L2 child learners of Dutch will apply the agreement rules of their native language to the second language (Dutch) before they start to acquire the agreement rules of the second language (de Jong et al., 2007). As a result, the agreement structure of the L2 may potentially be influenced: some characteristics seen during the development of Dutch agreement can be explained by the verbal paradigm of the native language (Van Heugten, 2013). The following paragraph describes the verbal paradigm of three morphologically rich languages: Turkish, Tarifiyt-Berber and Morrocan-Arabic and the possible impact their morphological structure may have on the acquisition of the Dutch subject-verb agreement.

2.6. The native languages(L1): Turkish, Tarifiyt-Berber and Morrocon-Arabic

2.6.1. Turkish

In comparison to Dutch, Turkish has a considerably rich morphological inflection system (de Jong et al., 2007; de Jong & Orgassa, 2007; Orgassa, 2009; Xanthos et al., 2010). This means, that Turkish has a larger number of morphemes and that every cell in the verbal paradigm is filled. There are six morphemes that mark the grammatical feature person on the verb, whether it be singular or plural, each person has its own morpheme (de Jong et al., 2007). Turkish also has an agglutinative morphology system, each grammatical feature is marked separately. Words are formed by joining suffixes to the verb stem to mark tense, possession, amount, case, agreement, mood, negation and aspect (de Rooij, 1998; Acarlar & Johnston, 2011). Each suffix generally has a separate meaning or function and maintains its original form and meaning when attached to a root or stem. Dutch has a fusional morphology, in which a single suffix has multiple meanings or functions: in the 3rd sg form of /drinkt/ the suffix (t) marks number, person and tense (de Jong et al., 2007).

Like Dutch, Turkish has a Subject-Object -Verb (SOV) word order, the conjugated verb takes the final position after a subject and any potential object in main sentences (Orgassa, 2009). Turkish does not have separate words for auxiliaries like Dutch has, but uses suffixes to represent auxiliaries (Verhagen, 2009). Furthermore, subjects and pronouns in sentences may be omitted in Turkish in certain instances, which is why it is referred to as a pro-drop language (de Jong et al., 2007; de Jong & Orgassa, 2007; Orgassa, 2009).

Children learning a morphologically rich language, learn verb inflection at a rapid rate (de Jong et al., 2007; Xanthos et al., 2010). In addition, noun conjugation and some verb suffixes are acquired at the early age of two years (de Jong et al., 2007). Moreover, during the acquisition of Turkish morphological inflection system children tend to make more substitution error types whereas, during the acquisition of the Dutch morphological inflection system children tend to make more omission error types (de Jong, 1999; de Jong & Orgassa, 2007).

2.6.2. Tarifiyt-Berber

There are several Berber languages. The majority of the Morrocan population in the Netherlands speak the Berber language Tarifiyt (E-Rramdani, 2003). Like Turkish, Tarifiyt has a considerably rich morphological inflection system and each grammatical feature is marked separately: prefixes and suffixes are attached to the stem of a verb to mark person, number, tense and gender (E-Rramdani, 2003). Although it has been stated that Tarifiyt has a Verb-Subject-Object (VSO) word order (McClelland, 1996; E-Rramdani, 2003), it is also said to have SVO and VOS word order (E-Rramdani,

2003). Just like Turkish, Tarifiyt is a pro-drop language, the subject pronouns being omitted in certain instances (E-Rramdani, 2003).

2.6.3. Morrocan-Arabic

Like the Turkish and Tarifiyt-Berber, Morrocan Arabic has a rich morphological inflection system and is a pro-drop language. The subject is realized in the conjugated verb (Verhagen, 2009). In the present tense prefixes and suffixes are joined to the verb stem to mark a grammatical feature: prefixes mark person, gender or number, suffixes mark a completed action or situation (Julien, 2017). In addition, there are separate suffixes that mark the female and male forms for the 2nd sg and 3rd sg. Morraccon - Arabic has SVO and VSO word order (van de Craats & van Hout, 2010). In sentences where there is one verb, the verb is placed in the initial position followed by the subject. In sentences where there are more verbs, the verb is placed after the subject (van Heugten, 2013).

2.7. Subject–verb agreement acquisition: Dutch L2 learners with SLI

Language comparative studies have shown that the structure of a language can impact the symptoms of SLI (de Jong & Orgassa, 2007). As previously mentioned, Turkish and Tarifiyt-Berber and Morran Arabic have considerably rich morphology inflection systems in comparison to Dutch. SLI children learning a language with a poor morphology inflection system seem to have more difficulties with morphology inflection than SLI children learning a language with a rich morphology inflection system (de Jong et al., 2007; de Jong & Orgassa, 2007). There have been several explanations for these difficulties. (1) Children with a native language that has a rich morphology inflection system use the inflection as a starting point to interpret a sentence, whereas children who's native language is Dutch or English are lead by word order (de Jong & Orgassa, 2007). (2) The morphemes in morphologically rich languages are more notable as they usually consist of syllables that can sometimes be lengthened. This property makes the morphemes more visible and easier to process than the (t) in Dutch or the (s) in English (de Jong & Orgassa, 2007). (3) Lastly, these rich languages have separate outputs for the grammatical feature person. Whether it be singular or plural, each person has its own morpheme (de Jong et al., 2007; de Jong & Orgassa, 2007). The two language types also differ in SLI symptoms: children in morphologically rich languages make particularly more substitution type errors. Due to the fact that each person, singular, and plural has its own morpheme, children have more alternatives for substitution (de Jong & Orgassa, 2007). In contrast, children in morphologically poor languages like Dutch or English make more omission type errors, due to their limited alternative options (de Jong & Orgassa, 2007).

It is apparent from the discussion of SLI and L2 that L1-SLI and L2 children are both delayed in their acquisition of subject-verb agreement in comparison to unimpaired L1 children. Accordingly,

the effects of SLI and L2 are expected to play a role in the language acquisition of L2 children with SLI, leading to a cumulative effect of L2-SLI (Steenge, 2006; Orgassa, 2009). Assuming the cumulative effect of L2-SLI applies, L2 children with SLI are expected to make substantially more errors than L1-SLI, unimpaired L1 and L2 children. Few studies have been conducted on child L2 children with SLI acquiring Dutch their as second language (Steenge, 2006; de Jong et al., 2007; Orgassa, 2009; Spoelman et al., 2012). Steenge (2006), investigated various linguistic aspects in Moroccan, Turkish and Surinamese L2-SLI children aged 6-9 acquiring Dutch. She compared the L2-SLI children linguistic aspects to that of age-matched L1-SLI children and unimpaired L1 and L2 children. In analyzing the subject-verb agreement, she found no significant differences in error rates in the L2-SLI children compared to L1-SLI children and unimpaired L2 children. However, clear SLI effects were found in terms of the omission errors for both SLI groups. Specifically, they produced more omission errors in the 3rd sg context than the unimpaired L1 and L2 children. These results led to the conclusion that the omission of the 3rd sg agreement marker can be seen as a clinical marker for SLI. In her study of the acquisition of subject-verb agreement Orgassa (2009) found that L2-SLI children made significantly more errors than their L2 peers, but surprisingly not more than their L1-SLI peers. Thus, no cumulative effect of L2-SLI was found. Taking into account the substantial difference in length of exposure to Dutch between L1-SLI children (7;3 years) and L2-SLI children (5;3 years), it is quite surprising that no significant difference was found. The findings by Steenge (2006) and Orgassa (2009) indicates that the difficulties in the subject-verb agreement of L2-SLI children are less affected by L2 effects and more seriously affected by SLI effects. In addition, de Jong's et al. (2007) investigation found that Turkish-Dutch SLI children (L2) with the average age of 7;4 attained an accuracy of 74 % correct usage of the subject-verb agreement and the Dutch SLI children (7;3) attained an accuracy of 79%, whereas the unimpaired L1 (4;8) and L2 (6;7) children both attained accuracy scores above the 'acquisition criterium' of 90% . Interestingly, the L2-SLI children in this study attained an accuracy score of 93% for the correct usage of the 3rd sg and the L1-SLI children attained an accuracy of 74%.

2.8. Research hypotheses

The participants in this study were unimpaired (typically developing) successive bilingual children and successive bilingual children with a specific language impairment. Dutch was their second language (L2), their first language (L1) being either Turkish, Moroccan-Arabic or Tarifiyt-Berber.
This study attempts to answer the following overall question: Is the omission of the 3rd sg suffix a diagnostic marker for SLI in successive bilingual children? On the basis of the literature study of unimpaired successive bilingual children, impaired successive bilingual children and specifically their use of the subject-verb agreement in the 3rd sg context, four specific hypotheses were formulated.

- Successive bilingual children with SLI omit the 3rd sg agreement marker significantly more often than unimpaired successive bilingual children.

- Age has a positive significant effect on unimpaired successive bilingual children as well as on successive bilingual children with SLI in producing the 3rd sg agreement marker .

- There is a strong positive correlation between the use of the 3rd sg agreement marker in different tasks.

- The omission of the 3rd sg agreement marker is such a strong distinction that it can be qualified as a diagnostic marker for SLI in successive bilingual children with a specific language impairment

3. Methodology and materials

3.1. Background

In order to test the formulated hypotheses, data originating from Manuela Julien's study of Dutch language acquisition was used (see Julien, 2017). Julien developed three experimental tasks to investigate the role of auxiliaries in the acquisition of agreement and verb second in monolingual and bilingual children with specific language impairment as well as unimpaired monolingual and bilingual children. This thesis investigates the production of the 3rd sg by unimpaired successive bilingual children and successive bilingual children with SLI. In addition, only the two production tasks developed by Julien were used in this study.

3.2. Participants

Fifty-two successive bilingual children participated in this study. The participants consisted of 25 unimpaired successive bilingual children (UI) between the ages of 5;0 and 8;11 years and 27 successive bilingual children with SLI (SLI) between the ages of 5;1 and 8;8 years . The UI-group consisted of four children with Moroccan-Arabic as their native language, five children with Tarifit-Berber as their native language and 16 children with Turkish as their native language. The SLI-group consisted of five children with Moroccan-Arabic as their native language, seven children with Tarifit-Berber as their native language and 15 children with Turkish as their native language. Children that spoke more than two languages were not allowed to participate. Furthermore, the UI and the SLI-groups were each divided in young (5;0-6;11) and mid-young (7;0-8;11) age groups. Figure 3.1 gives a summarized overview of the participants:

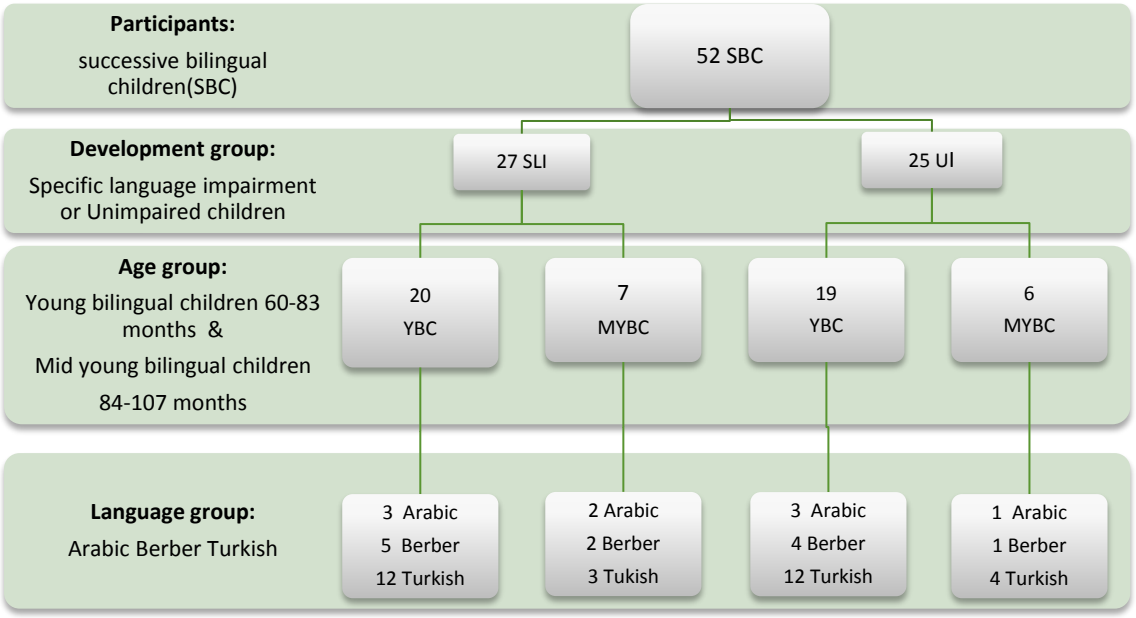

***Figure 3.1: categorization of* successive bilingual children**

The unimpaired successive bilingual children in this study are having their education at a regular primary school. They have an IQ of 85 or higher and there are no signs of cognitive problems, behavioral or hearing problems (Julien, 2017). A detailed overview of the selection criteria is available in Appendix 1. The successive bilingual children with SLI were all diagnosed by a committee of indication specialists and have a cluster 2 indication. That indicates that the diagnosed SLI is present in the child's native language as well as Dutch and that the delays in language are not caused by insufficient language input. Furthermore, in order to get an individual view of the participant's language situation, parents were required to fill out a questionnaire. See Appendix 2 for the full version of the questionaire. To reduce regional effects, children were selected from different regions in the Netherlands.

3.3. Research tasks

Two production task will be analyzed in this thesis. The tasks were created by means of the Swedish animation series named Pingu. In the animation series the main character, Pingu, uses nonverbal communication, gestures as well as postures, to portray a message or action. The same applies to his friends. Specific fragments from the animation series were selected showing Pingu or his friends, performing an apparent action, associated with a specific verb. The verbs used in each tasked were selected from the "Streeflijst woordenschat zesjarigen" (Schaerlaekens, Kohnstamm & Lejaegere, 1999) or the list Duizend-en-één-woorden, the *allereerste Nederlandse woorden voor anderstalige peuters en kleuters* (Bacchini et al., 2005). In our list, the verbs were divided into four types. These verb types were differentiated from one another based on their durative nature,

argument structure and the potential existence of an object in the sentence signaling an endpoint of the action or state (Vendler 1957).

- **Type I verbs consists of stative verbs**: these verbs describe a state and not an action, there is no change, no movement, no demarcation of time, and no distinguished endpoint. Example: expressing an external state liggen ('lie') or an internal state Horen ('hear'), which expresses an internal state. Furthemore stative vebs typically cannot be used with a durative, thus in Dutch they cannot be used with 'áan het+ INF'contruction (Julien, 2017). Julian (2017), observed that stative verbs expressing an internal state liggen ('lie') rarely use an auxilaxy and the stative verbs expressing an external state Horen ('hear') use the auxilary hebben ('have') when expressing the perfect aspect.

Type II/III/I V: Non–stative verbs: Debcribe an action, express duration and begin point. Show qualities capble of change.

- **Type II verbs consist of transitive verbs**: these verbs describe an action with a subject and express duration. Example: een glas breken ('break a glass'). These verbs use the auxilary hebben ('have') when expressing the perfect aspect.

- **Type III verbs consist of intransitive verbs**: these verbs have no clear endpoint and require subject. Example: in het zwembad springen ('jump in the pool') These verbs use the auxilary hebben ('have') when expressing the perfect aspect.

- **Type IV verbs consist of resultive verbs**: these verbs have a clear endpoint, require a subject and a preposition . Example: naar het school lopen ('go to school') These verbs use the auxilary zijn ('be') when expressing the perfect aspect.

All research tasks were executed with the program E-prime, version 2.0.8.90 (Schneider, Eschman & Zuccolotto, 2001). The utterances of the participants were automatically recorded using the program E-prime and saved as a WAV-file. Due to the fact that the program had a limited recording time, an Olympus digital voice recorder VN-8500PC was also used to record the utterances of all tasks in the experiment.

3.3.1. The sentence completion task

The first production task was a "sentence completion task". The participant in this task saw specific film fragments of Pingu or a friend performing two related actions, and then a picture of Pingu performing the second action appeared on the screen. At that moment the participant was verbally

presented with the target verb in its infinitive form followed by the sentence that needed completion, for example: '**Drinken / Pingu heeft dortst en hij…' (To drink / Pingu is thirsty and he…).** The participant had to complete the sentence with the 3rd sg form '**drinkt' (drinks)**. Figure 3.1 gives a picture of the above-mentioned example**: To drink / Pingu is thirsty and he drinks.** Furthermore, the items were randomly presented to the participants via a computer or laptop .

Figure 3.1: picture of item 'drinken' 'to drink' from the sentence completion task.

The sentence completion task consisted of 34 test items . The target-verbs were divided in three categories: Irregular, regular and complex verbs and the four verb types. They are given in Table3.1. See appendix 5 for an overview of the test items in the sentence completion task.

Table 3.1: Target-verbs in sentence compition task categorized by sorts and types

	Type I	**Type II**	**Type III**	**Type IV**
Irregular	Zitten Liggen Zien	Vangen Geven Drinken	Slapen Vliegen Springen	Glijden Klimmen Vallen
Regular	Kennen Voelen	Schoppen Kussen	Zwaaien Huilen Tekenen	Botsen Rennen Schaatsen
Complex	Loslaten Neerzetten Vastzitten	Uitblazen Opruimen Voorlezen	Omkijken Aanbellen Uitslapen	Binnenkomen Uitstappen Wegrijden

3.3.2. The narrative task

The narrative task was designed to stimulate the participants to use the 3rd sg present tense, future tense, and present perfect tense. The narrative task consisted of 16 test items and four practice items. The practice items were used first to get the participants acquainted with the task. The 16 test items were randomly shown to the participants via a computer or laptop. Similar to the previous task, the participants were shown a short film of Pingu performing a specific action, which represented a specific target-verb. The target verb was presented as follows: **'Deze film gaat over… target-verb+infinitive' (This film is about… target-verb+infinitive)**. After viewing the film the

participants were presented with three pictures of the film portraying the target verb which corresponded with the present, future and present perfect tense. The pictures were displayed in chronological order as illustrated in figure 3.2.

Figure: 3.2: *picture of the item 'maken' 'to make' from the narrative task. In the first picture Pingu has yet to perform an action, and is preparing to do so. In the second Pingu is performing the action. In the last Pingu has preformed the action; the action is completed.*

The participant is first asked to state the action in the second picture (3rd sg present tense). The instructor says the following sententence: **Wat gebeurt er hier? Pingu…….(What is happening here? Pingu……)**, as a stimulus during the execution of the practice items. They confirm the participants verbal reaction by stating the following sentence: **Ja, hij 'stamvorm+t' (Yes, he 'stem+t')**. Next, the participant was stimulated to state the action in the first picture (future tense). After stating the action in the future tense, the participant is asked for the second time to state the action in the second picture the (3rd sg present tense). Lastly, the participant was stimulated to name the action in present perfect tense with the aid of the third picture. If a participant was not able to use the specif target verb during the task, the instructor would correct the participant with the following sentence: '**Kun je ook een zin maken met target-verb+infinitive' (Can you also make a sentences with target-verb+infinitive).** The execution of the narative task took approximatly 30 minues per participant. Table 3.2 offers an overview of the 16 target verbs in narrative task categorized by types.

Table 3.2: Target-verbs in narrative task categorized by types

Verb Type	**Type I**	**Type II**	**Type III**	**Type IV**
Practice items	Dichtmaken	Pakken	Dansen	Klimmen
Test items	Liggen Krijgen Zitten Staan	Eten Maken Dicht doen Geven	Plassen, omkijken Huilen Slapen	Glijden Vallen Springen Lopen

3.4. Data analysis

Guidelines based on the Child Language Data Exhange System (CHILDES) (MacWhinney, 2000) were used to orthgraphically transcribe the recorded utterances in the two production tasks using the software program Microsoft Excel 2007/2010. Each utterance was given a code. The coding system was specifically designed for the two production tasks. It consisted of five categories, each representing a particular type of inflection: Code 1 = correct lexical inflection, Code 2 = correct inflected auxiliary, Code 3 = incorrect inflection, Code 4 = incorrect no inflection, Code 5 = unclassifiable. It should be noted that the focus of this thesis is the inflection of the lexical verbs and not the inflection of an added auxiliary. However, if the added auxiliary is correctly inflected (3rd sg present tense), it is considered correct, whereas if the added auxiliary does not agree with the subject (3rd sg present tense), it is seen as unclassifiable. An overview of the coding system can be found in Appendix 7. The transcriptions of the utterances were coded and scored by multiple researchers. If the codes did not correspond it was checked by a third party or the research supervisors. If a participant produced multiple sentences per test item, these sentences were also coded and scored, but only the sentences that corresponded the best with the target sentence was analysed. The coded transcription were transported into the statistic program IBM SPSS 21 for further coding and analyses. See Appendix 6 for an example of a coded transtription of the Narrative task.

4. Results of the sentence completion task

The omission of the agreement marker for the 3rd sg present tense (3rd sg) verb form was investigated in the sentence completion task. Participants of this task had to complete 34 auditory sentences with the 3rd sg after seeing a short film. A detailed description of the sentence completion task can be found in paragraph 3.3.1.

4.1. Participants

A total of 46 successive bilingual children participated in the sentence completion task, 26 successive bilingual children with SLI (=SLI) and 20 unimpaired successive bilingual children (= UI). Both groups were also categorized for age (age group) and language (language group) as shown in Figure 4.1.

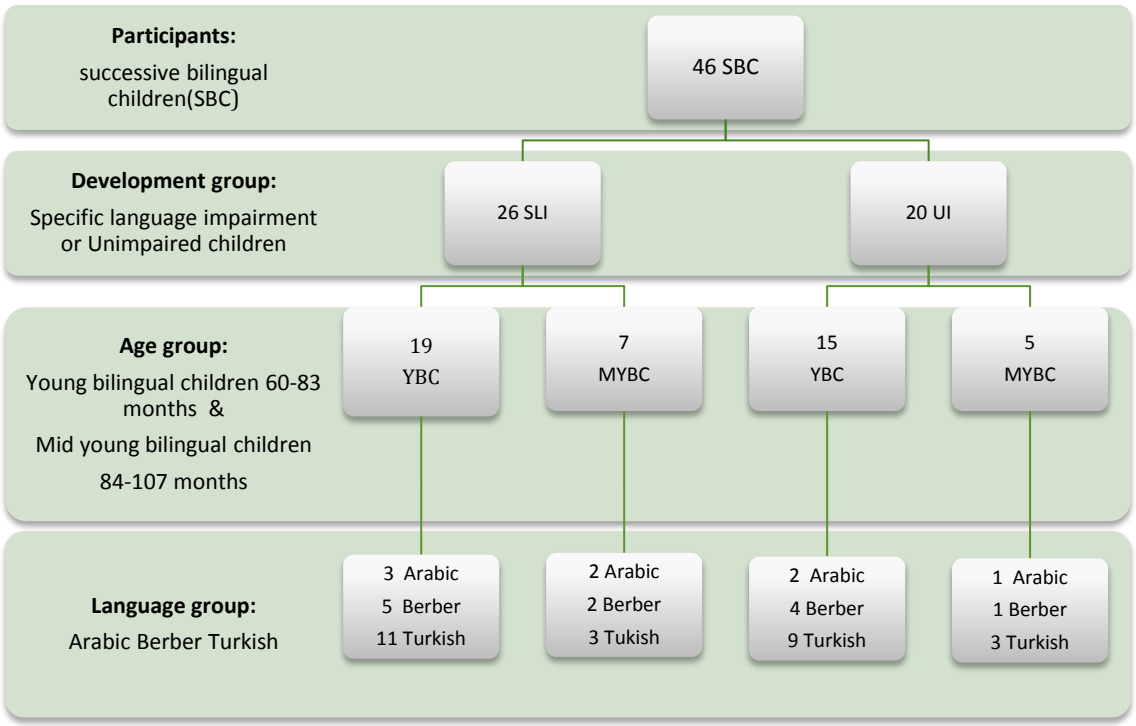

***Figure 4.1: Categorization of* successive bilingual children**

4.2. Data analysis

Of the 46 participants 42 were able to complete all 34 test items in the task (cf. Table 4.1 and 4.2). The test items of the four participants who did not complete the whole task were included in the analysis as well. Of these four participants, participant 402, a young bilingual male with SLI (8;2 years native language: Turkish), was most notable. As can be seen in Table 4.2 this participant was unable to complete 22 items, due to unknown circumstances. The other three participants were only unable

to complete one item out of the 34. Furthermore, a number of participants had difficulty producing adequate responses for the test items, which resulted in multiple responses per test item. In addition, some of them had difficulty producing responses with the target verb. Consequently, they replaced the target verb with another one or completely omitted the verb in their response. The response that matched the test item best was chosen for further analysis.

4.2.1. Types of inflection and correct scores

In order to gain insight into the participants' individual performance of the completion task an overview of the inflection types used per participant and their correct score are given in Tables 4.1 and 4.2.

The accuracy of the responses of the participants was determined as follows. When the participant responded with the 3rd sg of lexical verb (correct lexical inflection=code 1), e.g. *Hij loopt (he walks)* or the 3rd sg of an added auxiliary (correct inflected auxiliary = code 2), e.g. *Hij gaat lopen (he goes to walk??)* the items were considered correct. If the responses were, for example, the infinitive of the lexical verb (incorrect inflection= code 3), e.g. *Lopen (to walk)* or stem form of the lexical verb (incorrect no inflection = code 4), e.g. *Hij loop (he walk),* they were considered incorrect. The responses that did not fall under any of the above-mentioned inflection types were found to be unclassifiable (unclassifiable = code 5). The coding system in Appendix 7 gives an overview of all the possible responses. The Individual correct percentage scores of the 3rd sg were calculated using the following formula:

$$\textbf{Correct score \%=} \frac{\textbf{(}\text{total of code 1 + total code 2)}}{\text{(total of code: 1 + 2 +3 + 4)}} \textbf{ X 100}$$

As can be seen in the formula the unclassifiable responses were excluded from the calculation..

4.3. Types of inflection

4.3.1. Types of inflection produced by the unimpaired participants

It is apparent from Table 4.1 that the majority of the unimpaired participant's responses were correct (code 1 or code 2). Closer inspection reveals that 13 of the 20 unimpaired participants used the correct inflection of the lexical verb (code 1) in their responses. Although this group has a great deal of correct responses, four of them (242, 263, 230 and 262) have several incorrect responses

consisting of the stem form of the lexical verb (code 4). The rest has two or less responses with no inflection (code 4). Furthermore, participant 205 (6;4 years), a young bilingual female with Turkish as her native language attained a perfect score by only using the correct lexical inflection in all of her responses, which is the highest score of all the participants in this task including the SLI participants. This result is quite interesting given the fact that there are unimpaired participants that are older than her who attained a less than perfect score.

Table 4.1 also reveals that seven of the 20 participants have a majority of correct inflections of an added auxiliary (code 2). In addition to their frequent use of the correct inflection of an added auxiliary in their responses, three of the seven participants (251, 209 and 415) have nine or more unclassifiable responses. Taking into consideration the substantial amount of unclassifiable responses made by these three participants, it was decided to give a more detailed description of their unclassifiable sentence structures.

Participant 251 (5;8 years), a young bilingual female with Berber as her native language, produced 17 responses with the correct auxiliary inflection (code 2), and 14 unclassifiable responses. These unclassifiable responses consisted of one particular sentence structure:

- Gaan +INF + v.t. (to go + infinitive + past tense), e.g. *Pingu ging zwaaien (Pingu went to wave)*

Participant 209 (6;3 years), a young bilingual male with Turkish as his native language, produced 17 responses with the correct auxiliary and 15 unclassifiable responses. These unclassifiable responses consisted of two sentence structures:

- Incongruentie hulpwerkwoord onderwerp (Incongruence auxiliary subject), e.g. *En hij ga al drinken (And he already go to drink)*
- Gaan +INF + v.t. (to go + infinitive + past tense), e.g. *De zeehond ging geven naar de Pingu (The seal went to give to the Pingu)*

Participant 415 (5;7 years), a young bilingual female with Turkish as her native language, produced 24 responses with the correct auxiliary inflection and nine unclassifiable responses. These unclassifiable responses consisted of one sentence structure, including the doubling of the auxiliary:

- Incongruentie hulpwerkwoord onderwerp (Incongruence auxiliary subject), e.g. *Hij ga ga huilen (he go go to cry)*

The most notable results of the UI group were that of participant 227 (5;8 years), a young bilingual male with Turkish as his native language. He produced 13 incorrect responses with code 3 consisting of the incorrect inflection, e.g. *Pingu uitslapen (Pingu to sleep out),* 16 responses with the correct auxiliary inflection, one response with the correct inflection of the lexical verb and four unclassifiable responses, e.g. *Pingu ga liggen (Pingu go to sleep)*. His results are quite surprising considering that several of his younger peers produced more correct responses than he did (See table 4.1: 214 and 252).

Although unimpaired, several of the participants had some difficulties producing the 3rd sg. Taking into to consideration the amount of unclassifiable and incorrect response, it seems as if the Turkish L1 participants had a little more difficulty producing the 3rd sg than the Arabic or Berber L1 participants. With the exception of participant 251, these participants either had the largest amounts of incorrect or unclassifiable responses (See participants: 209, 214, 227 and 415 in Table 4.1) Furthermore, this particular group of participants also have the two lowest correct scores.

Table 4.1: Overview of the types of inflection used per unimpaired participant and the correct scores; see formula in 4.2.1

Unimpaired Participant	**Types of inflection**							
	Correct lexical inflection Code 1	Correct auxiliary inflection Code 2	Incorrect inflection Code 3	Incorrect No inflection Code 4	Unclassifiable Code 5	Missing	Total Items	**Correct scores %**
Arabic								
221-YBC (10)	23	8	2	1	0		34	**91**
242-YBC (14)	28	0	0	6	0		34	**82**
263-MYBC (18)	31	0	0	3	0		34	**91**
Berber								
230-MYBC (13)	26	3	0	3	2		34	**90**
251-YBC (15)	1	17	1	1	14		34	**90**
252-YBC (16)	10	22	0	1	1		34	**96**
262-YBC (17)	26	4	0	4	0		34	**88**
264-YBC (19)	31	2	0	1	0		34	**97**
Turkish								
201-YBC (1)	26	6	1	0	1		34	**97**
203-YBC (2)	32	0	0	2	0		34	**94**
205-YBC (3)	34	0	0	0	0		34	**100**
206-MYBC (4)	32	1	0	1	0		34	**97**
207-MYBC (5)	27	5	0	2	0		34	**94**
209-YBC (6)	0	17	0	1	15	1	33	**94**
210-MYBC (7)	33	0	0	1	0		34	**97**
213-YBC (8)	27	6	0	0	1		34	**100**
214-YBC (9)	11	14	0	7	2		34	**78**
226-YBC (11)	11	21	0	2	0		34	**94**
227-YBC (12)	1	16	13	0	4		34	**57**
415-YBC (32)	0	24	1	0	9		34	**96**

4.3.2. Types of inflection produced by the SLI participants

Table 4.2 reveals that the majority of the SLI participants' responses were also correct (code 1 or code 2). However, in a small number of cases the SLI participants responses show an infrequent use of these two inflection types (code 1 or 2),and reveal a great deal of unclassifiable responses (code 5) or incorrect responses (code 3 and 4). In addition, several SLI participants show no obvious use of any particular inflection type in their responses, but use a variety of inflection types.

Of the 27 SLI participants 17 participants used the correct inflection of the lexical verb (code 1) in the majority of their responses. Although participants 443, 444, 445, 447, 423, 427 and 416 all frequently used the correct lexical inflection in their responses, they also have six or more incorrect responses (codes 3 and 4).

Participant 443 (7;1 years), a mid young bilingual male with Arabic as his native language, produced eight incorrect responses: three with the incorrect inflection, e.g. *Pingu zien de zeehond (Pingu to look the seal),* and five with no inflection, e.g. *Pingu drink de ice tea op (Pingu drink up the ice tea)*. He also produced 17 responses with the correct inflection of the lexical verb and ten responses with the correct auxiliary inflection.

Participant 444 (5;8 years), a young bilingual female with Arabic as her native language, produced ten incorrect responses: nine with the incorrect inflection, e.g. *Pingu de bal schoppen (Pingu to kick the ball)* and one with no inflection, e.g. *De zeehond pijn voel (The seal feel pain)*. She also produced 21 responses with the correct lexical inflection, one response with the correct auxiliary inflection and one response was considered unclassifiable.

Participant 445 (6;9 years), a young bilingual male with Arabic as his native language, produced seven incorrect responses: three with the incorrect inflection, e.g. *loslaten (to release)* and four with no inflection, e.g. *Pingu schaats (Pingu skate)*.

Participant 447 (8;5 years), a mid young bilingual female with Arabic as her native language, produced six incorrect responses: four with the incorrect inflection, e.g. *Pingu zitten op de auto (Pingu to sit on the car),* and two with no inflection, e.g. *Zwaai naar Pingu (Wave to Pingu)*.

Participant 423 (6;6 years), a young bilingual male with Berber as his native language, produced seven incorrect responses: two with the incorrect inflection, e.g. *Pingu zien de vriend (Ping to see the friend)*, and five with no inflection, e.g. *Drink het lemonade (drink the lemonade).*

Participant 425 (6;11 year), a young bilingual female with Berber as her native language, produced seven incorrect responses: one with the incorrect inflection, six incorrect responses with no inflection, e.g. *Huil (to cry),* and one unclassifiable response.

Participant 427 (8;8 years), a mid young bilingual male with Berber as his native language, produced seven incorrect responses with no inflection, e.g. *Blaas uit (blow out),* and two unclassifiable responses.

Participant 416 (5;1 years), a young bilingual male with Turkish as his native language, produced 14 incorrect responses: 12 with the incorrect inflection, e.g. *Pingu auto zitten (Pingu to sit car),* and two with no inflection, e.g. *Auto bots (car cash)* and one unclassifiable response.

As can be seen in Table 4.2 participants 421, 426, 409 and 413 frequently used the correct inflection of an added auxiliary in their responses. Table 4.2 also shows that participants 408 and 412 have a high number of unclassifiable responses.

Participant 408 (6;3 years), a young bilingual male with Turkish as his native language produced 24 unclassifiable responses. These unclassifiable responses consisted of one sentence structure:

- Incongruentie hulpwerkwoord onderwerp (incongruence auxiliary subject), e.g. *Pingu ga teken(en) (He go to draw)*

In addition, he had five incorrect responses: three consisting of the incorrect inflection, e.g. *Pingu zien (Pingu to see)* and two consisting of no inflection, e.g. *Hij vang hem (He catch it)*. The remaining five responses were considered correct (Code 1 and 2).

Participant 412 (5;2 years), a young bilingual female with Turkish as her native language, produced 14 correct response (code1 and 2), three incorrect inflection responses (code 3), e.g. *Aanbellen (to ring (the doorbell),* and 17 unclassifiable responses. These unclassifiable responses consisted of two sentence structures:

- Incongruentie hulpwerkwoord onderwerp (incongruence auxiliary subject), e.g. *Vogel ga vliegen (Bird go to fly)*
- Modal + INF + o.v.t (to want + infinitive + past tense), e.g. *Wil wegrijden (want to ride away)*

The most notable results in Table 4.2 were those of participants 407, 411, 414 and 416. These participants individually have 12 or more incorrect responses (incorrect inflection and no inflection).

Participant 407 (5;8 years), a young bilingual female with Turkish as her native language, produced 12 incorrect responses: ten consisting of the incorrect inflection, e.g. *Vangen (to catch)* and two consisting of no inflection, e.g. *Kom binnen (come inside)*. In addition, she also has six unclassifiable responses, which consisted of two sentence structures:

- Incongruentie hulpwerkwoord onderwerp (incongruence auxiliary subject), e.g. *Ga uitblazen (Go to blow out)*
- Modal + INF (to want + infinitive + past tense), e.g. *Moet kijken (Must see)*

Despite frequently using the correct inflection of the lexical verb (19 times), participant 416 (5;1 years, male, native language Turkish) has 12 responses consisting of the incorrect inflection, e.g. *Schaatsen (to skate)* and two consisting of no inflection, e.g. *Auto bots (car crash).*

Half of participants 414 (5;6 years, male, native language Turkish) responses were considered incorrect. These responses consisted of 15 with the incorrect inflection, e.g. *Pingu uitblazen (Pingu blow out)* and two with no inflection, e.g. *Drink (Drink)*.

Lastly, Participant 411 (6;0 years), a young male bilingual with Turkish as his native language, has 20 incorrect responses: 18 consisting of the incorrect inflection, e.g. *Huilen (to cry)* and two with no inflection, e.g. *Klim (climb)*; as well as 2 unclassifiable responses.

Like in the unimpaired group several of the Turkish L1 SLI participants had more difficulties producing the 3rd sg than the L1 Arabic and Berber participants. The Turkish L1 SLI participants have the highest amount of incorrect and unclassifiable responses (See participants: 407, 408, 411, 412, 414 and 416 in Table 4.2).

Table 4.2: Overview of the types of inflection used per SLI participant and the correct scores; see formula in 4.2.1.

SLI Participant	Types of inflection							
	Correct lexical inflection Code 1	Correct auxiliary inflection Code 2	Incorrect inflection Code 3	Incorrect No inflection Code 4	Unclassifiable Code 5	Missing	Total items	**Correct scores %**
Arabic								
443-MYBC (42)	17	10	3	5	0		34	**79**
444-YBC (43)	21	1	9	1	1		34	**69**
445-YBC (44)	26	1	3	4	0		34	**79**
446-YBC (45)	27	6	1	0	0		34	**97**
447-MYBC (46)	23	5	4	2	0		34	**82**
Berber								
421-YBC (35)	8	22	2	1	1		34	**91**
423-YBC (36)	22	5	2	5	0		34	**79**
424-YBC (37)	22	8	0	3	1		34	**90**
425-YBC (38)	24	1	1	6	2		34	**78**
426-YBC (39)	2	25	5	0	1	1	33	**84**
427-MYBC (40)	24	1	0	7	2		34	**78**
430-MYBC (41)	22	8	0	4	0		34	**88**
Turkish								
401-MYBC (20)	29	2	1	2	0		34	**91**
402-MYBC (21)	12	0	1	0	0	22	13	**92**
403-YBC (22)	33	0	0	1	0		34	**97**
405-YBC (23)	27	2	0	3	2		34	**90**
407-YBC (24)	10	6	10	2	6		34	**57**
408-YBC (25)	1	4	3	2	24		34	**50**
409-YBC (26)	1	32	0	0	1		34	**100**
410-YBC (27)	26	2	5	1	0		34	**82**
411-YBC (28)	9	3	18	2	2		34	**37**
412-YBC (29)	1	13	3	0	17		34	**82**
413-YBC (30)	3	26	3	0	1	1	33	**90**
414-YBC (31)	16	1	15	2	0		34	**50**
416-YBC (33)	19	0	12	2	1		34	**57**
418-MYBC (34)	29	1	1	1	2		34	**93**

4.4. Production of the 3rd sg

In order to gain insight into the participants' performance of the 3rd sg the individual correct percentage score was calculated. Figure 4.2 shows the correct percentage scores of the participants according to their age, split out for group.

Of the 27 SLI participants 20 attained a correct percentage score of 78% or higher. As shown by the black arrow in figure 4.2, participant 446-SLI (6;10 years), a young bilingual male with Arabic as his native language, attained a correct percentage score of 100%. This score is higher than five of the unimpaired participants who are older than him (dotted arrows in figure 4.2). Participants 403-SLI (81 months, 6;9 years), 409-SLI (80 months, 6;8 years), 421-SLI (83 months, 6;11 years) and 418-SLI (103 months, 8;7 years) also have correct percentage scores that are higher than some older unimpaired participants.

Although participants 251-UI, 209-UI and 415-UI all have percentage scores above 90%, they also have large amounts of unclassifiable responses. As previously mentioned the unclassifiable responses were excluded from the formula, which is why their scores are so high.

It should come to no surprise that participants 227-UI, 407-SLI, 408-SLI, 411-SLI, 414-SLI and 416-SLI all have a correct percentage score that is less than 60% (see figure 4.2). Surprisingly, participant 227-UI (68 months, 5;8 years), a young bilingual male with Turkish as his native language, attained a correct percentage score of only 57%, a score that was also attained by his SLI peer participant 407-SLI (68 months, 5;8 years), a young bilingual female with Turkish as her native language (see the red arrow in figure 4.2). In addition, participant 416-SLI (61 months, 5;1 years) attained a correct percentage score of 58% which is higher than that of 227-UI who is older in age and unimpaired (see the orange arrow in figure 4.2).

Participant 408-SLI (75 months, 6;3 years) attained a correct percentage score of 50%. A correct percentage score that was also attained by his younger SLI peer participant 414-SLI (66 months, 5;6 years) (see the purple arrow in figure 4.2). Furthermore, participant 411-SLI (72 months, 6;0 years), who is older than most of the participants mentioned in this paragraph attained a correct percentage score of only 37%, which is the lowest score of all the participants (see the blue arrow in figure 4.2).

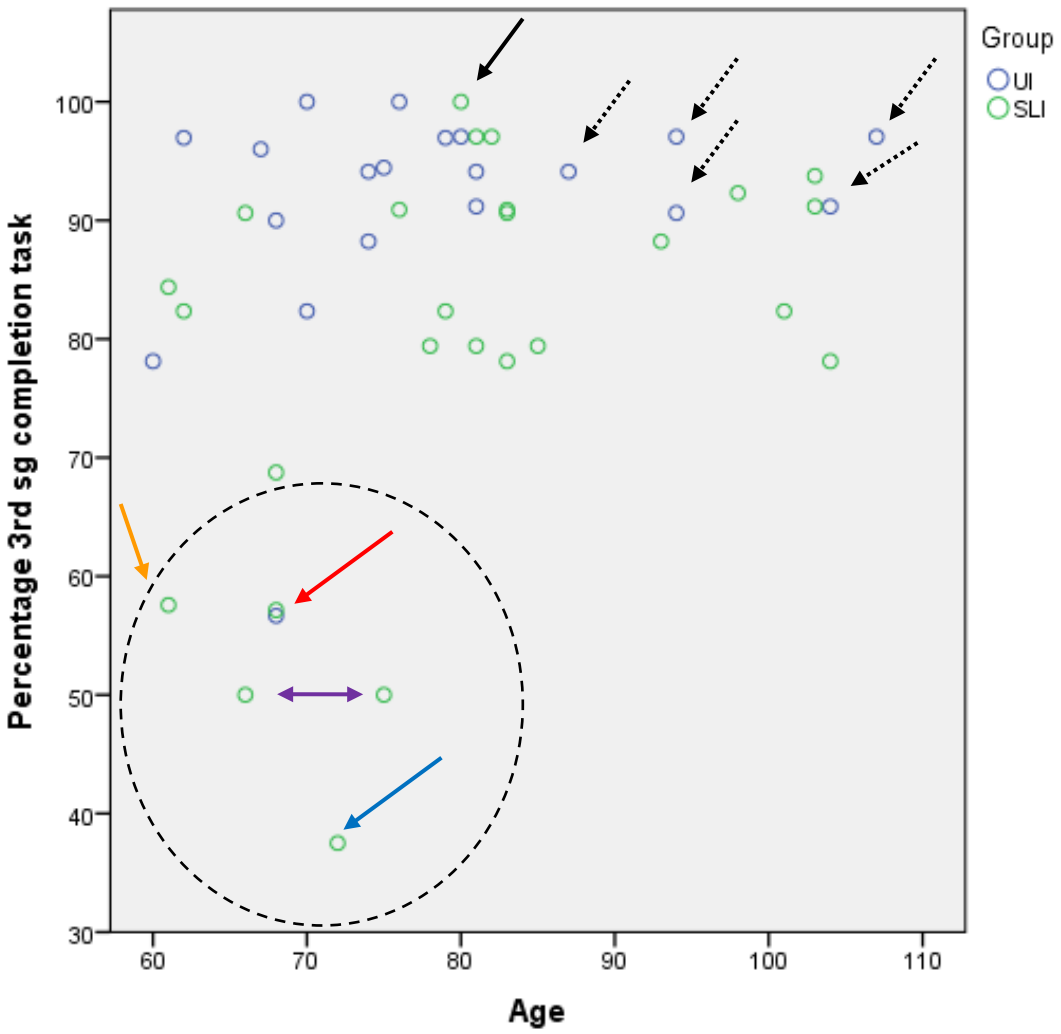

Figure 4.2: Percentage correct inflection of the 3rd sg per participant (per group and age)

4.5. The use of 3rd sg in the research groups

In order to get a better understanding of the differences between the SLI and UI participants regarding their use of the 3rd sg, Table 4.3 gives the mean correct percentage scores regarding the use of the 3rd sg in the four research groups.

Table 4.3: Overview of the mean correct percentage score regarding the use of the 3rd sg per group

	Young bilinguals	Mid young bilinguals
Unimpaired		
Correct %	90.4% (N=15; SD = 11.2)	94.0% (N=5; SD = 3.1)
SLI		
Correct %	77.1% (N=19; SD = 18.4)	86.5% (N=7; SD = 6.4)

As expected, Table 4.3 reveals that the unimpaired participants in both age groups attained higher mean percentage scores regarding the use of the 3rd sg than the SLI participants. Furthermore, the mid young unimpaired participants attained higher mean percentage score, than the young unimpaired participants. Although they attained a higher mean percentage score than their younger peers, it was only by 3,6%. Similarly, the mid young SLI participants also attained higher mean percentage scores than the young SLI participants (the difference is 9,4%).

Figure 4.3 shows boxplots. All four are on the higher part of the graph indicating a frequent use of the 3rd sg by the majority of the participants.

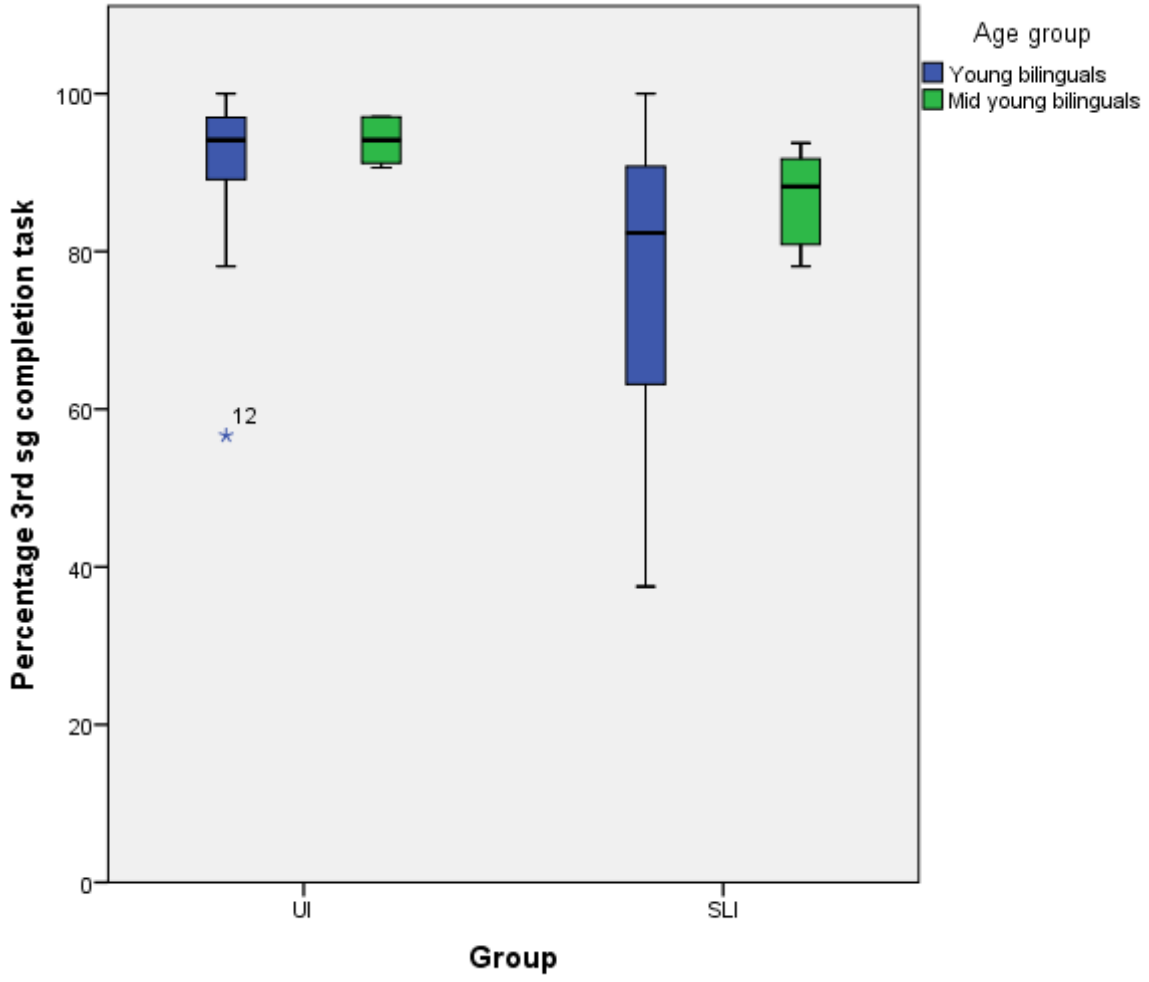

Figure 4.3: Percentage correct inflection of the 3rd sg per group

The boxplot representing the unimpaired young bilinguals shows one outlier, participant 227-UI (5;8 years) a young bilingual male with Turkish as his native language, who made considerably less use of the 3rd sg in his responses than the other children. The boxplots indicate more variation in the younger groups and more variation in the SLI groups.

To determine if age had an effect on the performance of the completion task and if there are any differences between the unimpaired group (UI) and the SLI group (SLI), an analysis of variance was carried out on the data. The factor group consisted of two levels (UI and SLI) and the factor age consisted of two levels (young and mid young). There was a significant main effect of group on the production of 3rd sg agreement marker, F (1,42) = 4,89, p=0,033. There was no significant main effect of age on the production of 3rd sg agreement marker, F (1,42) = 1,90, p= 0,176. There was no significant interaction between age and group on the production of 3rd sg, F (1,42) = 0,80, p= 0,541.

Table 4.4: Overview of the produced unclassifiable sentence structures; the 'x' in the table represents the production of a particular sentence structure by the participant.

Unimpaired Participant	Produced unclassifiable sentence structures			Total unclassifiable responses versus total items
	Incongruentie hulpwerkwoord onderwerp (Incongruence auxiliary subject)	Modaal+INF +t.t. of v.t. (Modal+infinitive+ present tense or past tense)	Gaan+INF+v.t. (to go+infinitive+ past tense)	
251-YBC			x	**14/34**
209-YBC	x		x	**15/34**
415-YBC	x			**9/34**
SLI Participants				
407-YBC	x	x		**6/34**
408-YBC	x			**24/34**
412-YBC	x	x		**17/34**

4.6. Summary results of the completion task

To summarize, the results of the sentence completion task show that 13 of the 20 unimpaired bilingual participants frequently used the correct inflection of the lexical verb in their responses and seven participants frequently used the correct inflection of an auxiliary. However, three of these participants had large amount of unclassifiable responses. Table 4.4 gives an overview of the unclassifiable sentence structures produced by these three participants. The most notable results in Table 4.1 were that of participant 227-UI (5;8 years), a young bilingual male with Turkish as his native language. He is the negative outlier in Figure 4.3 in his group.

Seventeen of the 27 SLI participants frequently used the correct inflection of the lexical verb in their responses and four participants frequently used the correct inflection of an auxiliary. The most notable results in Table 4.2 were that of participants 407-SLI, 411-SLI, 414-SLI and 416-SLI. These four participants individually have 12 or more incorrect responses. Participants 408-SLI and

412-SLI both have 17 or more unclassifiable responses (See Table 4.4 for an overview of their unclassifiable sentence structures).

As far as the individual correct percentage is concerned 20 of the 27 SLI participants attained a score of 78% or higher. Interestingly, participant 446-SLI (6;10 years), a young bilingual male with Arabic as his native language, attained the high score of 100%. Nineteen of the 20 UI participants attained a score of 78% or higher.

To conclude, based on the data from the completion task evidence was found to support the first hypothesis that successive bilingual children with SLI omits the 3rd sg agreement marker significantly more often than unimpaired successive bilingual children. The production of the 3rd sg agreement marker is significantly affected by SLI. Furthermore, no evidence was found to support the second hypothesis that age has a positive significant effect on unimpaired successive bilingual children as well as on successive bilingual children with SLI in producing the 3rd sg agreement marker.

5. Results of the narrative task

The narrative task was designed to stimulate the participants to use the 3rd sg present tense (3rd sg), future tense and the present perfect tense in their responses. Participants of this task had to complete 16 auditory sentences with the 3rd sg present tense, future tense, and the present perfect tense each after seeing a short film followed by a series of pictures. However, the primary objective of this thesis is to investigate the omission of the agreement marker for the 3rd sg present tense, which is why the other two tenses will not be discussed here. A detailed description of the narrative task can be found in paragraph 3.3.2.

5.1. Participants

A total of 51 successive bilingual children participated in the narrative task, 27 successive bilingual children with SLI (= SLI) and 24 unimpaired successive bilingual children (= UI). Both groups were also categorized for age (age group) and language (language group) as shown in figure 5.1.

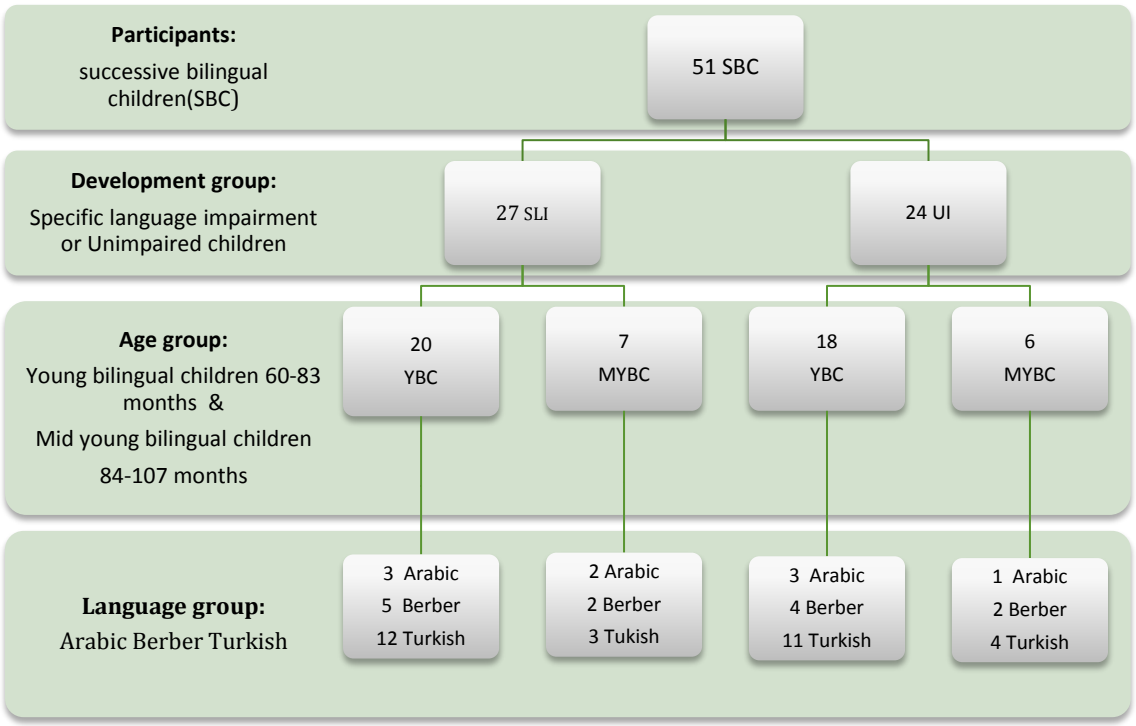

Figure 5.1: **Categorization of the successive bilingual children**

5.2. Data analysis

Of the 51 participants, 50 were able to complete all 16 test items in the task (cf. Table 5.1 and 5.2). The completed test items of the one participant who did not complete the whole task were included in the analysis as well. As can be seen in table 5.1 this participant was only unable to complete one item of the 16. Similar to the task in the previous chapter several participants had difficulty producing adequate responses for the test items, which resulted in multiple responses per test item. Furthermore, several of them had difficulty producing responses with the target verb. Consequently, they replaced the target verb with another one or completely omitted the verb in their response. The response that matched the test item best was chosen for further analysis.

5.2.1. Types of inflection and correct scores

In order to gain insight into the participants' individual performance on the narrative task an overview of the inflection types used per participant and their correct percentage scores are given in Tables 5.1 and 5.2.

Like the responses in the previous task, the responses to the test items in the narrative task were also categorized under one of the following codes: code 1 (correct lexical inflection), code 2 (correct inflected auxiliary), code 3 (incorrect inflection), code 4 (incorrect no inflection) or code 5 (unclassifiable). See the coding system in Appendix 7 for an overview of all the possible responses and codes. Furthermore, the Individual correct percentage scores of the 3rd sg were calculated using the following formula:

$$\textbf{Correct score \%=} \frac{\text{total of code 1 + total code 2)}}{\text{(total of code: 1 + 2 +3 + 4)}} \textbf{ X 100}$$

As mentioned earlier, the unclassifiable responses were excluded from the formula.

5.3. Types of inflection

5.3.1. Types of inflection produced by the unimpaired participants

Table 5.1 reveals that the majority of the unimpaired participant's responses were correct (code 1 or code 2). Specifically, 13 of the 24 unimpaired participants have ten or more correct responses. Furthermore, these 13 participants have a maximum of two incorrect responses (code 3 or code 4).

Although this group of participants has a great deal of correct responses, two of them (220 and 264) have several unclassifiable responses. The rest has two or less unclassifiable responses.

As can be seen in Table 5.1, participant 220 (5;1 years), a young bilingual female with Arabic as her native language, had a total of ten correct responses consisting of the correct lexical inflection (code 1) and correct auxiliary inflection (code 2). She also produced two incorrect responses consisting of an incorrect inflection (code 3), an *infinitive verb form,* and no inflection (code 4), a *verb stem,* and four unclassifiable responses. These unclassifiable responses consisted of three sentence structures:

- Modal + INF + t.t (to want +infinitive+ present tense), e.g. *Hij wil geven (He wil give)*
- Chunk of imperatief (chunk or imperative)
- Gaan +INF + v.t. (to go + infinitive + past tense), e.g. *Hij ging plassen (He went to pee)*

Participant 264 (6;8 years), a young bilingual female with Berber as her native language, also has a total of ten correct responses consisting of the correct lexical inflection (code 1) and correct auxiliary inflection (code 2). She also has six unclassifiable responses. These unclassifiable responses consisted of two sentence structures:

- Finiet: onvoltooide verleden tijd finite past tense), e.g. *Hij kreeg een cadeautje van de zeehond (He got a gift from the seal)*
- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *Toen ging die springen (Then he went to jump)*

The most notable results were that of participant 227 (5;8 years), a young bilingual male with Turkish as his native language. He has nine responses with the incorrect inflection (code 3), e.g. *infinitive verb form* and one unclassifiable, *Incongruence auxiliary subject*. This result is quite surprising considering that four of his younger peers have more correct responses than he does (see Table 5.1: 208, 220, 252, and 415).

As far as the ten remaining participants are concerned, these participants have seven or more unclassifiable (code 5) responses. Taking into consideration the substantial amount of unclassifiable responses made by these ten participants, it was decided to give a more detailed description of their unclassifiable sentence structures.

Participant 242 (5;10 years), a young bilingual female with Arabic as her native language, produced six responses with the correct lexical inflection (code 1) and ten unclassifiable responses. These unclassifiable responses consisted of three sentence structures:

- Finiet: onvoltooide verleden tijd (finite past tense), e.g. *Maar toen viel hij af (But then he fell off)*
- Finiet: incorrecte vervoeging onvoltooide verleden tijd (incorrect finite past tense), e.g. *Toen eette hij wat op (Then he ate op something)*
- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *Hij ging glijen (He went to glide/ to slide)*

Participant 251 (5;8 years), a young bilingual female with Berber as her native language, produced eight correct responses (code1 and 2), one incorrect response with no inflection (code 4), e.g. *verb stem* and seven unclassifiable responses. These unclassifiable responses consisted of two main sentence structures:

- Finiet: onvoltooide verleden tijd (finite past tense), e.g. *En toen ging de deur dicht (And then the door went closed/shut)*
- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *Toen ging hij deze kant heel erg huilen (Then he went really to cry this side)*

Participant 262 (6;2 years), a young bilingual female with Berber as her native language, produced four correct responses (code 1 and 2) and 12 unclassifiable responses. These unclassifiable responses consisted of five sentence structures:

- Voltooid verleden tijd (past perfect tense), e.g. *Had de deur bijna dichtgedaan (Had almost closed the door)*
- Modal + INF + v.t (to want +infinitive+ past tense*), e.g. En hier wou die hem bijna geven (And here he wanted almost give him)*
- Zijn+INF van bedoelde werkwoord + v.t (to be + infinitive + past tense), e.g. *Daar was die op de trap lopen (There he was to walk on the stairs)*
- Zijn + voltooid deelwoord verleden tijd (to be + past perfect tense), e.g. *En daarzo was die bijna op de grond gesprongen (And over there he was almost jumped on the ground)*
- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *Toen ging die derop liggen (Then he went to lie on it)*

Participant 202 (6;5 years) a young bilingual male with Turkish as his native language produced one correct responses (code 2) and 15 unclassifiable responses. These unclassifiable responses consisted of three sentence structures:

- Finiet: onvoltooide verleden tijd (finite past tense), e.g. *En toen ging hij erop (And then he went on it)*
- Voltooid verleden tijd (past perfect tense), e.g. *En hier had hij hem op tafel gedaan (And here he had done it on the table)*
- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *En hier ging hij hem eten (And here he went to eat it)*

Participant 203 (6;9 years), a young bilingual male with Turkish as his native language, produced one correct responses (code 2) and 14 unclassifiable responses. These unclassifiable responses consisted of three sentence structures:

- Finiet: onvoltooide verleden tijd (finite past tense), e.g. *En toen viel die eraf (And then that fell off)*
- Modal + INF + v.t (to want +infinitive+ past tense),e.g. *Toen moest ie een beetje huilen (Then he must cry a bit)*
- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *Daar ging die liggen (There he went to lie)*

Participant 204 (7;5 years), a mid young bilingual male with Turkish as his native language, produced only one correct responses (code 1), one incorrect response consisting of the incorrect inflection (code 3), an *infinitive verb form,* and 14 unclassifiable responses. These unclassifiable responses consisted of three sentence structures:

- Finiet: onvoltooide verleden tijd (finite past tense), e.g. *Ja, eh, Pingu kreeg van de zeehond een cadeau (Pingu got a gift from the seal)*
- Modal + INF + v.t. (to want +infinitive+ past tense), *e.g. Voor de zeehond, en de zeehond eh, wilde hem pakken (For the seal, and the seal, wanted to take it)*
- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. G*ing die dicht doen (Went to close it)*

Participant 205 (6;4 years), a young bilingual female with Turkish as her native language, produced six correct responses (code 1 and 2) and ten unclassifiable responses. These unclassifiable responses consisted of two sentence structures:

- Finiet: onvoltooide verleden tijd (finite past tense), e.g. *En toen, eh deed mama de deur dicht (And then mama did the door close)*
- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *En toen ging naar achteren kijken (And then went to look back)*

Participant 206 (7;10 years), a mid young bilingual female with Turkish as her native language, produced six correct responses (code 1 and 2) and ten unclassifiable responses. These unclassifiable responses consisted of two sentence structures:

- Modal + INF + v.t. (to want + infinitive + past tense), e.g. *En toen wou de zeehond pakken (And then wanted to take the seal)*
- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *En toen ging mama de deur dicht doen (And then mama went to close the door)*

Participant 209 (6;3 years), a young bilingual male with Turkish as her native language, produced four correct responses (code 1 and 2), one incorrect response consisting of the incorrect inflection (code 3), an *infinitive verb form,* and 11 unclassifiable responses. These unclassifiable responses consisted of four sentence structures:

- Modal + INF (to want +infinitive)*, e.g. Hij wil zelf eten (He wants to eet)*
- Zijn + INF van bedoelde werkwoord + v.t (to be + infinitive + past tense), e.g. *Pingu was staan (Pingu was to stand)*
- Zijn + voltooid deelwoord verleden tijd (to be + past perfect tense), e.g. *Pingu was in de zeehond gezit op de rug (Pingu was in the seal, sat on the back)*
- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *Ging die vis eten (Pingu went to eet that fish)*

Participant 214 (5;0 years) a young bilingual female with Turkish as her native language produced four correct responses (code 1 and 2), one incorrect response with no inflection (code 4), a *verb stem,* and nine unclassifiable responses. These unclassifiable responses consisted of one sentence structures:

- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *Pingu … ging huilen (Pingu went to cry)*

Closer inspection of the 11 participants who have large amounts of unclassifiable responses and Table 5.1 reveals, that several of the Turkish L1 participants have the most difficulties producing the 3rd sg in comparison with the Berber and Arabic L1 participants. Furthermore, the Turkish L1 participants have the two lowest correct scores of the unimpaired group.

Table 5.1: Overview of the types of inflection used per unimpaired participant and the correct scores; see formula in 5.2.1

Unimpaired Participant	Types of inflection							
	Correct lexical inflection Code 1	Correct auxiliary inflection Code 2	Incorrect inflection Code 3	Incorrect No inflection Code 4	Unclassifiable Code 5	Missing	Total items	**Correct scores %**
Arabic								
220-YBC(1)	2	8	1	1	4		16	**83**
221-YBC (2)	2	10	2	0	2		16	**88**
242-YBC (3)	6	0	0	0	10		16	**100**
263-MYBC (4)	9	7	0	0	0		16	**100**
Berber								
230-MYBC (5)	8	7	1	0	0		16	**94**
251-YBC (6)	1	7	0	1	7		16	**89**
252-YBC (7)	12	2	0	0	2		16	**100**
262-YBC (8)	3	1	0	0	12		16	**100**
264-YBC (9)	6	4	0	0	6		16	**100**
Turkish								
201-YBC (10)	9	5	0	0	2		16	**100**
202-YBC (11)	0	1	0	0	15		16	**100**
203-YBC (12)	2	0	0	0	14		16	**100**
204-MYBC (13)	1	0	1	0	14		16	**50**
205-YBC (14)	4	2	0	0	10		16	**100**
206-MYBC (15)	1	5	0	0	10		16	**100**
207-MYBC (16)	6	8	0	0	2		16	**100**
208-YBC (17)	12	1	2	0	1		16	**87**
209-YBC (18)	1	3	1	0	11		16	**80**
210-MYBC (19)	14	0	0	0	2		16	**100**
214-YBC (20)	5	1	0	1	9		16	**86**
225-YBC(21)	8	6	0	0	2		16	**100**
226-YBC (22)	11	5	0	0	0		16	**100**
227-YBC (23)	2	3	9	0	1		15	**36**
415-YBC (24)	2	12	0	0	2		16	**100**

5.3.2. Types of inflection produced by the SLI participants

Table 5.2 reveals that the majority of the SLI participant's responses were correct. To be exact, 19 of the 27 SLI participants have 11 or more responses correct (code 1 and code 2). Four of them (445, 447, 406 and 414) have three to four incorrect responses (code 3 and/or 4). The remaining 15 participants all have a maximum of two incorrect responses (code 3 and 4). Furthermore, of the 19 participants one participant (418) has three unclassifiable responses (code 5), e.g. *to go +Infinitive + past tense*. The 18 remaining participants have a maximum of one unclassifiable response.

The most notable results were that of participant 411 (6;0 years), a young bilingual male with Turkish as his native language. He has seven correct responses consisting of the correct lexical inflection, nine incorrect responses; seven with the incorrect inflection (code 3), e.g. *the infinitive verb form* and two with no inflection (code 4), e.g. *verb stem.* These results are quite surprising considering that four of his younger peers have more correct responses than he does (See Table 5.2: 413, 414, 416, and 426).

As far as the remaining seven SLI participants are concerned, they all have nine or more unclassifiable (code 5) responses. The following section gives a more detailed account of the produced unclassifiable responses by these seven participants.

Participant 444 (5;8 years) a young bilingual female with Arabic as her native language, produced two correct responses with the correct lexical inflection (code1), one incorrect response with the incorrect inflection (code 3), e.g. *the infinitive verb form* and 13 unclassifiable responses. These unclassifiable responses consisted of three sentence structures:

- Incongruentie hulpwerkwoord onderwerp (incongruence auxiliary subject), e.g. *Hij ga plassen (He go to pee)*
- Finiet: onvoltooide verleden tijd (finite past tense), e.g. *ging nog verdrietig (went still sad)*
- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *Pingu… die pingu ging vallen (Pingu went to fall)*

Participant 424 (6;4 years), a young bilingual male with Berber as his native language, produced three correct responses (code 1 and 2), one incorrect response with no inflection (code 4), a *verb stem* and 12 unclassifiable responses. These unclassifiable responses consisted of one sentence structures:

- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *Pingu… pingu ging vallen (Pingu went to fall)*

Participant 430 (7;9 years), a mid young bilingual male with Berber as his native language, produced three correct responses (code1 and 2) and nine unclassifiable responses. These unclassifiable responses consisted of one sentence structure:

- Gaan + INF + v.t. (to go + infinitive + past tense), e.g. *Pingu… pingu ging op de zeehond zitten (Pingu went to sit on the seal)*

Participant 403 (6;9 years), a young bilingual male with Turkish as her native language, produced two correct responses (code1 and 2) and 12 unclassifiable responses. These unclassifiable responses consisted of two sentence structures:

- Zijn + INF van bedoelde werkwoord +v.t (to be+infinitive+v.t), e.g. *dan was ie aan springen (Then he was jumping)*
- Gaan + INF +v.t. (to go + infinitive +past tense), e.g. *Hij ging glijden (He went to glide/to slide)*

Participant 407 (5;8 years) a young bilingual female with Turkish as her native language produced two incorrect response with no inflection (code 4), e.g. *verb stem* and 14 unclassifiable responses. These unclassifiable responses consisted of one sentence structure:

- Incongruentie hulpwerkwoord onderwerp (incongruence auxiliary subject), e.g. *Pingu... ga sneeuwpop maken (Pingu go to make snowman)*

Participant 408 (6;3 years), a young bilingual male with Turkish as his native language, produced four correct responses (code1 and 2) and 12 unclassifiable responses. These unclassifiable responses consisted of one sentence structure:

- Incongruentie hulpwerkwoord onderwerp (incongruence auxiliary subject), e.g. *Pingu ga lopen in de trap (Pingu go to walk in the stairs)*

Participant 412 (5;2 years), a young bilingual female with Turkish as her native language, produced three incorrect responses (code 4), e.g. and 13 unclassifiable responses. These unclassifiable responses consisted of one sentence structure:

- Incongruentie hulpwerkwoord onderwerp (incongruence auxiliary subject), e.g. *Pingu… ga maken (Pingu go to make)*

Like the unimpaired group, several of the Turkish L1 SLI participants had more difficulties producing the 3rd sg than the L1 Arabic and Berber participants. With the exception of participant 444 (L1 Arabic) and 424 (L1 Berber), several of the Turkish L1 SLI participants have large amounts of incorrect

or unclassifiable responses (see participants: 403, 407, 408 and 411 and 412 in Table 5.2). In addition, this group of participants also have the two lowest correct scores.

To conclude, the unimpaired participants seem to have had more difficulties producing the 3rd sg than the SLI participants. Specifically 12 of 24 UI participants have large amounts of unclassifiable or incorrect responses, whereas eight of the 27 SLI participants have large amounts of unclassifiable or incorrect responses (cf. Table 5.2).

Table 5.2: Overview of the types of inflection used per SLI participant and the correct scores; see formula in 5.2.1.

SLI Participant	Types of inflection							
	Correct lexical inflection Code 1	Correct auxiliary inflection Code 2	Incorrect inflection Code 3	Incorrect No inflection Code 4	Unclassifiable Code 5	Missing	Total items	**Correct scores %**
Arabic								
443-MYBC (25)	13	1	1	1	0	0	16	**88**
444-YBC (26)	2	0	1	0	13	0	16	**67**
445-YBC (27)	11	2	0	3	0	0	16	**81**
446-YBC (28)	13	2	1	0	0	0	16	**94**
447-MYBC (29)	5	6	0	4	1	0	16	**73**
Berber								
421-YBC (30)	8	6	0	2	0	0	16	**88**
423-YBC (31)	10	4	0	1	1	0	16	**93**
424-YBC (32)	2	1	0	1	12	0	16	**75**
425-YBC (33)	13	3	0	0	0	0	16	**100**
426-YBC (34)	13	0	1	1	1	0	16	**87**
427-MYBC (35)	11	5	0	0	0	0	16	**100**
430-MYBC (36)	5	2	0	0	9	0	16	**100**
Turkish								
401-MYBC (37)	13	2	0	0	1	0	16	**100**
402-MYBC (38)	15	1	0	0	0	0	16	**100**
403-YBC (39)	1	1	0	0	14	0	16	**100**
405-YBC (40)	14	1	1	0	0	0	16	**94**
406-YBC (41)	9	3	1	2	0	0	16	**80**
407-YBC (42)	0	0	0	2	14	0	16	**0**
408-YBC (43)	1	3	0	0	12	0	16	**100**
409-YBC (44)	0	16	0	0	0	0	16	**100**
410-YBC (45)	12	2	0	2	0	0	16	**88**
411-YBC (46)	7	0	7	2	0	0	16	**44**
412-YBC (47)	2	1	0	0	13	0	16	**67**
413-YBC (48)	5	10	0	1	0	0	16	**94**
414-YBC (49)	6	6	2	1	1	0	16	**80**
416-YBC (50)	13	0	2	0	0	0	16	**87**
418-MYBC (51)	12	0	0	1	3	0	16	**92**

5.4. Production of the 3rd sg

To gain insight into the participants' individual performance of the 3rd sg the individual correct percentage score was calculated. As mentioned earlier, an overview of the participants' individual correct percentage score can be found in Tables 5.1 and 5.2. In addition, the scatter plot in Figure 5.2 shows the correct percentage scores of the participants according to their age (in months) , split out for group.

Of the 24 UI participants 22 of them attained a correct percentage score of 80 % or higher. It should be noted that nine of these 20 participants have a large amount of unclassifiable responses of eight or more (see black dotted arrows). Unclassifiable responses were excluded.

As shown by the green arrow in Figure 5.2, participant 204-UI (89 months, 7;5 years), a mid young bilingual male with Turkish as his native language, attained a correct percentage score of 50%, which is the second lowest score of all the UI participants. These results are quite interesting, taking into consideration that several of his younger UI peers scored higher than him. In addition, several of the SLI participants also attained higher scores. It should be noted that he has 14 unclassifiable responses. It should come to no surprise that participant 227-UI (68 months, 5;8 years), a young bilingual male with Turkish as his native language, attained a low correct percentage score of 36% (see red arrow in Figure 5.2). Interestingly, he attained the lowest correct percentage score of both groups (UI and SLI).

Of the 27 SLI participants 25 of them attained a correct percentage score of 67% or higher. Like the participants of the unimpaired group several of the SLI participants (6 out of 25) have a large number of unclassifiable responses (see purple arrows in Figure 5.2).

It should come to no surprise that participants 411-SLI (72 months, 6;0 years), a young bilingual male with Turkish as his native language, attained a low correct percentage score of 44% (see blue arrow in figure 5.2). He has the largest number of incorrect responses of the SLI group. Interestingly, several of his younger SLI peers attained higher correct percentage scores than him. Surprisingly, participant 407-SLI (68 months, 5;8 years), a young bilingual female with Turkish as her native language, attained a correct percentage score of 0% (see the orange arrow in Figure 5.2). These results are quite interesting, taking into consideration that five of her younger SLI peers attained higher scores. It should be noted that she has 14 unclassifiable responses.

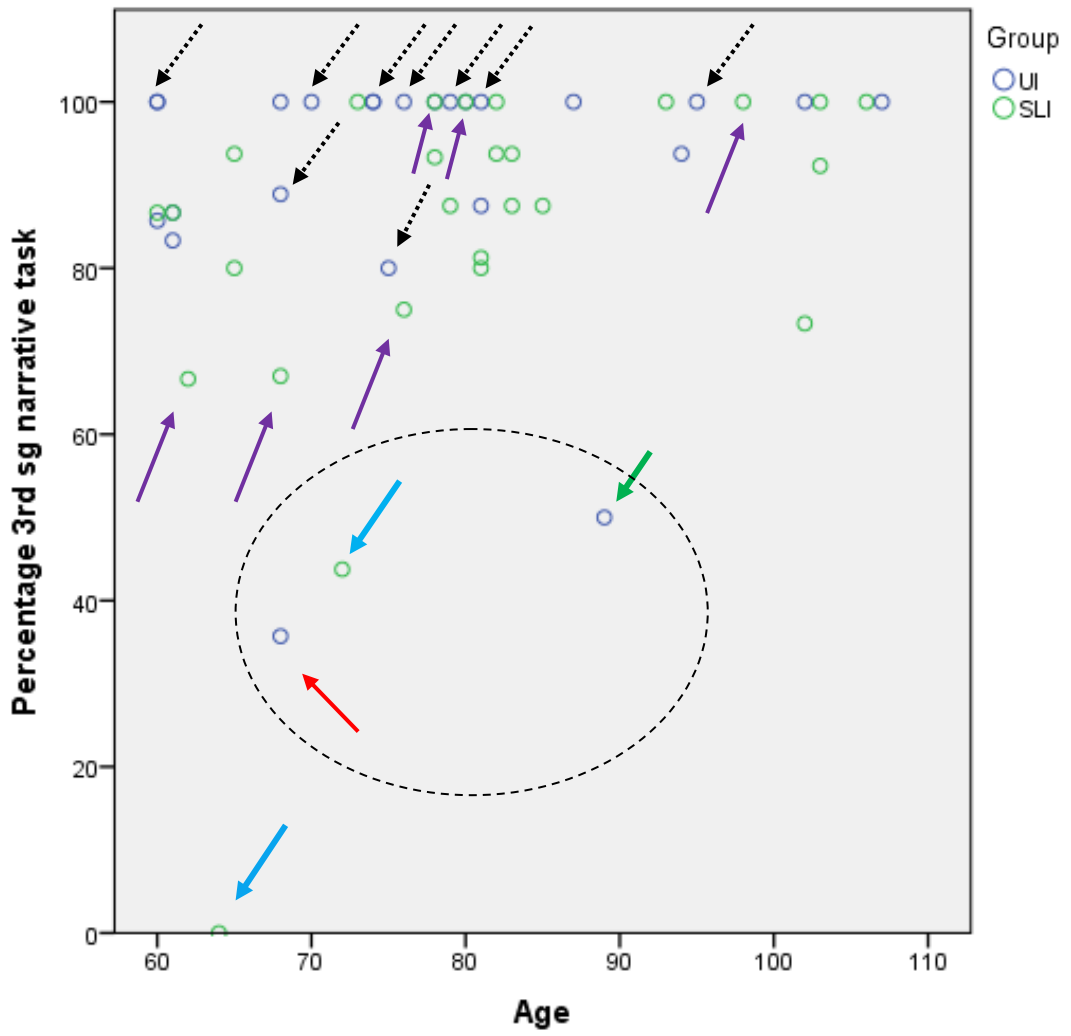

Figure 5.2: Percentage correct inflection of the 3rd sg per participant (per group and age)

5.5. The use of 3rd sg in the research groups

In order to have a better understanding of the differences between the SLI and UI participants regarding their use of the 3rd sg, Table 5.3 shows the mean correct percentage scores regarding the correct use of the 3rd sg in the four research groups.

Table 5.3: Overview of the mean correct percentage scores* regarding the use of the 3rd sg *per group

	Young bilinguals	Mid young bilinguals
Unimpaired		
Correct %	91.6% (N=18; SD = 15,7)	90,6% (N=6; SD = 20,1)
SLI		
Correct %	82,1% (N=20; SD = 23,5)	93,3% (N=7; SD = 10,1)

As expected Table 5.3 reveals that the young unimpaired participants attained a higher mean percentage score regarding the use of the 3rd sg than the young SLI participants. Surprisingly, the

mid young SLI participants and the young unimpaired participants both attained higher mean percentage score than the mid young unimpaired participants.

Figure 5.3 shows the boxplots. All four boxplots are on the higher part of the graph indicating a frequent use of the 3rd sg by the majority of the participants.

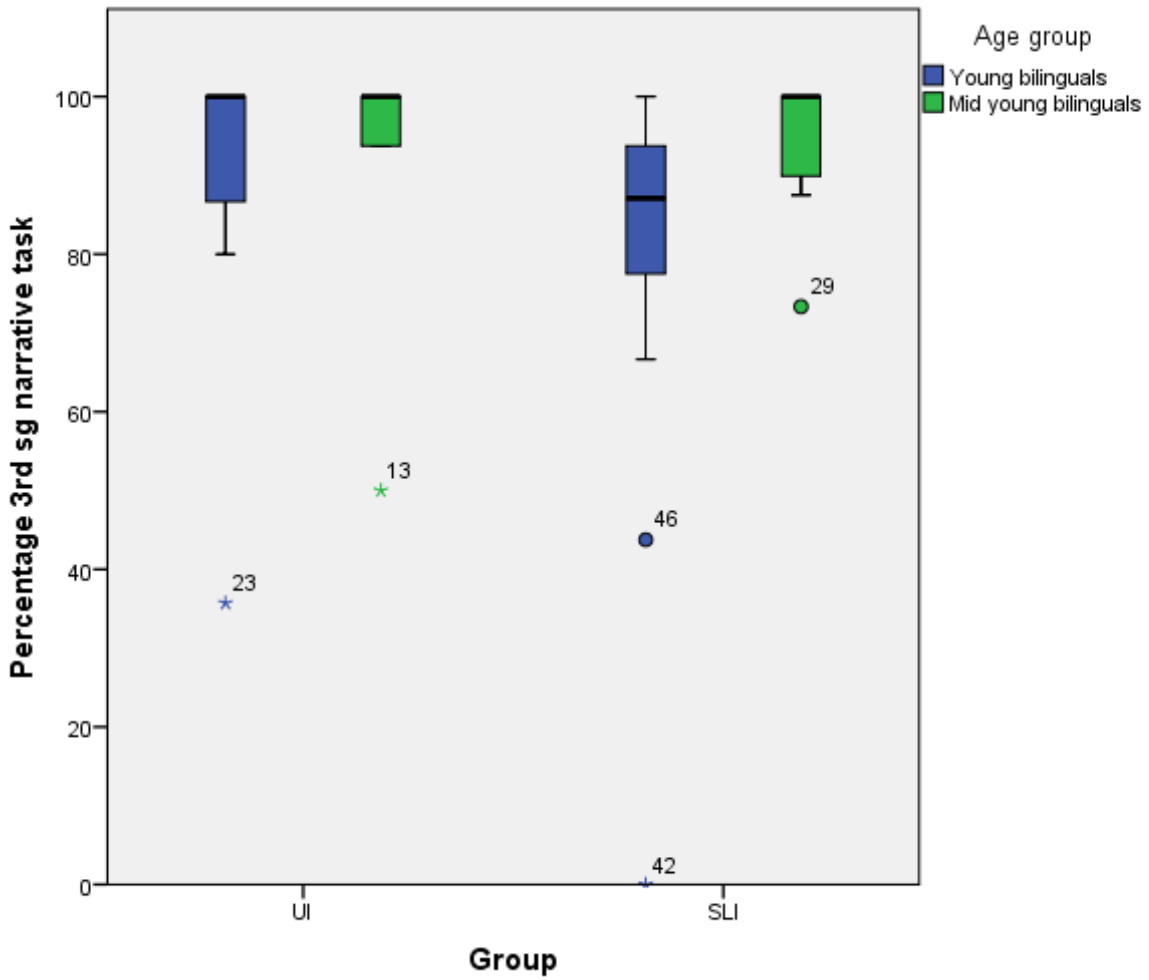

Figure 5.3: Percentage correct inflection of the 3rd sg per group

The boxplot representing the unimpaired young bilinguals show the largest amount of variation is in the lower quartile. In this group, there is one outliner, participant 227- UI (5;8) a young successive bilingual Turkish child, who made considerably less use of the 3rd sg in his responses than the other children and attained a correct score of only 36%.

The boxplot representing the young bilinguals with SLI is short, which indicates that the variability among the participants is small. However, there are two outliners: participant 411-SLI (6;0 years) and 407-SLI (5;8 years), two young successive bilingual Turkish children who made

considerably less use of the 3rd sg than the other children and attained a correct scores of only 44% and 0%.

The short lower and upper whiskers of the boxplot of the unimpaired mid young bilinguals indicates almost no variation among the participants in the lower and upper quartile. In this group, there is one outliner, participant 204-UI (7;5 years), a mid young successive bilingual Turkish child, who made considerably less use of the 3rd sg in his responses than the other children and attained a correct score of only 50%.

The boxplot representing the mid young bilinguals with SLI show the largest amount of variation is in the lower quartile. In this group, there is one outlier, participant 447-SLI (8;6 years) successive bilingual child with Arabic as her native language. child who made less use of the 3rd sg in her responses than most other participants and attained a correct score of only 73%.

To determine if age had an effect on the performance of the completion task and if there are any differences between the unimpaired group (UI) and the SLI group (SLI), an analysis of variance was carried out on the data. The factor group consisted of two levels (UI and SLI) and the factor age consisted of two levels (young and mid young). There was no significant main effect of group on the production of 3rd sg agreement marker, $F(1,47) = 0,42$, $p=0,520$. There was no significant main effect of age on the production of 3rd sg agreement marker, $F(1,47) = 0,87$ $p= 0,356$. There was no significant interaction between age and group on the production of 3rd sg, $F(1,47) = 1,17$, $p= 0,286$.

Table 5.4: Summary of the produced unclassifiable sentence structures; the 'x' in the table represents the production of a particular sentence structure by the participant.

	Produced unclassifiable sentence structures								**Total unclassifiable responses**
Unimpaired Participant	Finiet: onvoltooide verleden tijd (Correct finite past tense)	Finiet: incorrecte vervoeging onvoltooide verleden tijd (incorrect finite past tense)	Incongruentie hulpwerkwoord onderwerp (Incongruence auxiliary subject)	Voltooid verleden tijd (past perfect tense)	Modaal+INF +t.t of v.t (Modal+ infinitive+ present tense or past tense)	Zijn+INF van bedoelde werkwoord (to be +infinitive+v.t)	Zijn+voltooid deelwoord verleden tijd (to be+past perfect tense)	Gaan+INF+ v.t. (to go+ infinitive+ past tense)	
220-YBC					x				**4/16**
264-YBC	x								**6/16**
242-YBC	x	x							**10/16**
251-YBC	x								**7/16**
262-YBC	x			x	x	x	x		**12/16**
202-YBC				x					**15/16**
203-YBC	x				x				**14/16**
204-MYCB	x				x				**14/16**
205-YBC	x								**10/16**
206-MYBC					x				**10/16**
209-YBC						x	x		**11/16**
214-YBC									**9/16**
SLI Participant									
418-MYBC								x	**3/16**
444-YBC	x		x					x	**13/16**
424-YBC								x	**12/16**
430-MYBC								x	**9/16**
403-YBC						x		x	**12/16**
407-YBC			x						**14/16**
408-YBC			x						**12/16**
412-YBC			**x**						**13/16**

5.6. Summary results of the narrative task

To summarize, the results of the narrative task it reveals that 13 of the 24 unimpaired participants (UI) were able to produce the 3rd sg in ten or more of their 15-16 responses. The most notable results were that of participant 227-UI (5;8 years) a young bilingual male with Turkish as his native language, who had nine incorrect responses, which was the most incorrect responses of the UI group. Eleven of the 24 UI participants have six to 15 unclassifiable (code 5). Table 5.4 gives a summarized view of the unclassifiable responses produces by these unimpaired participants. This summary shows how numerous the unclassifiable answers were.

Nineteen of the 27 SLI participants were able to produce the 3rd sg in 11 or more of their 16 responses. The most notable results in the SLI group was that of participant 411-SLI (5;8 years), a young bilingual male with Turkish as his native language. He produced a total of nine incorrect responses, which was the most incorrect responses of the SLI group. In addition, seven SLI participants produced nine to 13 unclassifiable (code 5) responses (cf. Table 5.4).

As far as the individual correct percentage is concerned, 22 of the 24 UI participants attained scores of 80 % or higher. The two remaining UI participants attained the low scores of 50% and 36%. Twenty-five of the 27 SLI participants attained scores of 67 % or higher. The two remaining SLI participants attained scores of 44% and 0 %. Surprisingly, eight of the SLI participants attained the high scores of 100%. It should be noted that several of the participants (UI and SLI) produced a substantial amount of unclassifiable responses but nevertheless attained high correct percentage score.

To conclude, based on the data from the narrative task no evidence was found to support the first hypotheses that successive bilingual children with SLI omit the 3rd sg agreement marker significantly more often than unimpaired successive bilingual children and that the production of the 3rd sg agreement marker is not significantly affected by SLI. Furthermore, there was no evidence found to support the second hypothesis that age have a positive significant effect on unimpaired successive bilingual children as well as on successive bilingual children with SLI in producing the 3rd sg agreement marker.

6. Comparing the results of the two research tasks

6.1. Participants

A total of 44 successive bilingual children participated in both the completion and the narrative task, 25 successive bilingual children with SLI (=SLI) and 19 unimpaired successive bilingual children (= UI). Both groups were also categorized for age (age group) and language (language group) as shown in Figure 6.1.

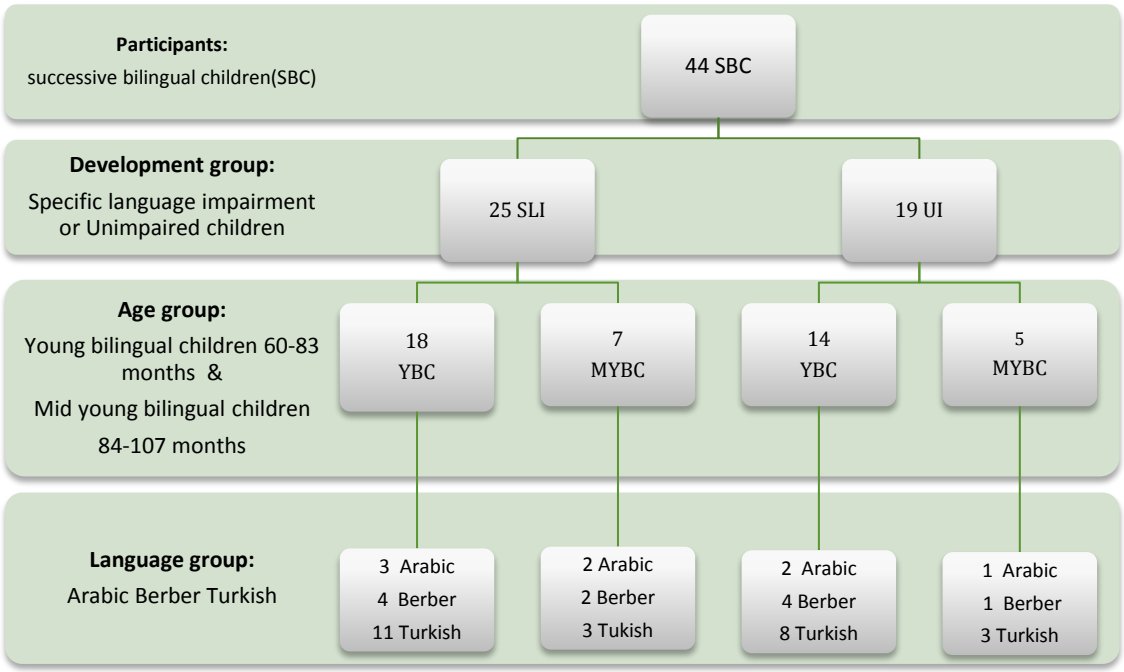

Figure 6.1: Categorisation of the successive bilingual children that participated in both tasks

6.2. Completion task versus Narrative task

As was mentioned in the two previous chapters, an analysis of variance was carried out on the data of the completion and narrative tasks to determine if age had an effect on the participant's performance and if there were any differences between the unimpaired group (UI) and the SLI group (SLI). No significant main effect of age was found for the production of 3rd sg agreement marker, nor in the completion or the narrative task. Furthermore, no significant main effect of group was found for the production of 3rd sg agreement marker in the narrative task. However, there was a significant group main effect in the production of the 3rd sg agreement marker in the completion task. No interaction effects were found between age and group.

A Pearson's correlation coefficient was computed to assess the relationship between the participant's performance of the 3rd sg in the completion task and the narrative task. There was a positive and significant correlation between the two tasks, r = .634, n = 43, p(two-tailed) < .01. These

results suggest that the production of the 3rd sg in both tasks clearly correlate. To further assess these results a paired-sample t-test was conducted to compare the production of the 3rd sg in the narrative and completion tasks. There was a significant difference between the correct percentage score in the narrative (M=90.9, SD=14.78) and completion (M=84.77, SD=14.72) tasks; t(42)=2.76, p = 0.008. These results suggest that the participants performed better in the narrative task. It was easier for the participants to produce 3rd sg in the narrative task than in the completion task.

6.2.1. Completion task versus Narrative task: group (UI and SLI) and age group (young and mid young)

Figure 6.2 gives a comparative view of the correct percentage scores of the participants according to age/group in the narrative and the completion tasks. As indicated by the small circle in Figure 6.2, the majority of the participants performed better in the narrative task than the completion task. There is a ceiling effect in the narrative task.

The correct percentage scores reveal that 15 of the 19 (79%) of the UI participants performed better in the narrative task than the completion task and only four (21%) UI participants performed better in the completion task. Ninety-five percent (18 of 19) of the UI participants attained a correct percentage score of 80% or higher in the narrative task. In the completion task, 95 % (18 of 19) of the UI participants attained a correct percentage score of 78% or higher. In both these tasks, the same participant (227) attained the lowest correct percentage scores in the UI group (36% and 57%, see the green arrow in Figure 6.2). Although participants 251, 209 and 415 (black dotted arrows) all attained percentage scores of 80% or higher in both tasks, these three participants also have seven to 15 unclassifiable responses in each task. There are four other participants (242, 203, 205 and 206) who also attained high correct scores, but also have a substantial amount of unclassifiable responses.

In the case of the SLI group, 18 of the 25 (72%) SLI participants performed similar (8%) or better (64%) in the narrative task, which means that only 28 % of the SLI participants performed better in the completion task. Eighty percent (20 of 25) of the participant's attained correct percentage score of 69% or higher in the completion task. In the narrative task, 92% (23 of 25) of the participant's attained correct percentage score of 67% or higher. Participant 407 attained a correct percentage score of 0% for the narrative task. As shown by the blue arrow in Figure 6.2, participants 411 performed equally bad in both tasks (cf. Table 4.2 and 5.2). Furthermore, the purple, orange and pink arrows in Figure 6.2, shows that participants, 414, 416 and 408 performed considerably better in the narrative task than in the completion task, whereas participant 412 (black arrow) performed

better in the completion task. It should be noted that participants 408 and 412 have between 12 through 24 unclassifiable responses in each task. As can be seen from the red arrow in the figure (below), participant 444 attained similar scores in both tasks. She also has a significant amount of incorrect responses in the completion task, whereas in the narrative task a significant amount of unclassifiable responses (cf. Table 4.2 and 5.2). Although participants 424, 430 and 403 (see red dotted arrows in Figure 6.2) attained high correct scores in both tasks, they also have nine or more unclassifiable responses in the narrative task and none in the completion task. Several of the SLI participants performed similar or even better than the UI participants, e.g. participants 409 attained perfect correct scores in both task and participant 446 has one incorrect response in each task.

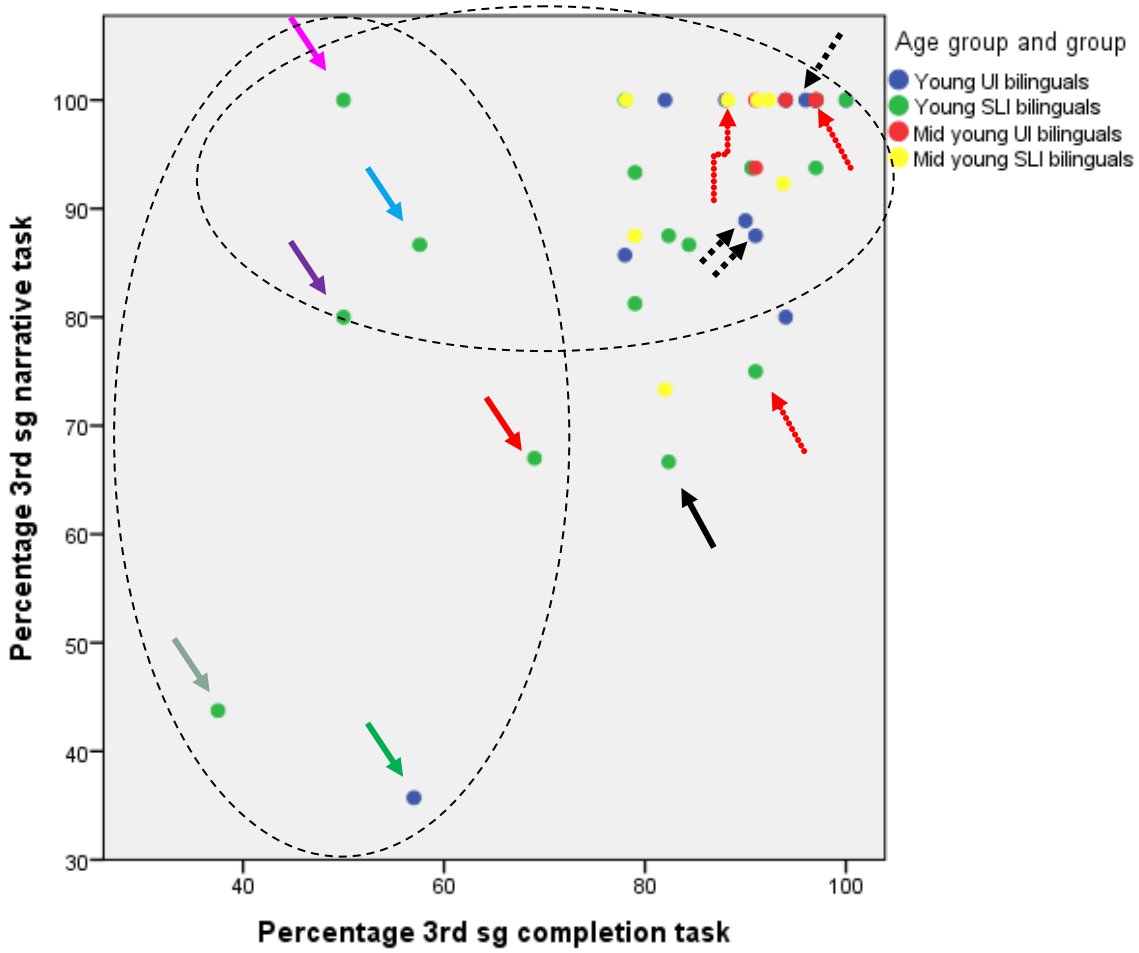

Figure 6.2: Percentage 3rd singular per participant (per age group and group) narrative task versus completion task

6.3. Summary results completion task versus narrative task

The narrative task turned out to be easier than the completion task. The differrence was significant and the narrative task had a ceiling effect, that has a negative effect on the correlation between both tasks. The correlation was nevertheless medium sized and significant.To conclude, based on the data

from the comparison between the narrative task and completion tasks evidence was found to support the third hypotheses that there is a positive correlation between the use of the 3rd sg agreement marker in different tasks. The production of the 3rd sg agreement marker is however significantly affected by the task type.

7. Discussion and Conclusion

7.1. Introduction

The central question of this study was whether the omission of the 3rd sg present tense (3 rd sg) is a diagnostic marker for SLI in successive bilingual children. On the basis of this research question and the literature study, four specific hypotheses were formulated in paragraph 2.8. In order to test these four hypotheses, two production tasks were used: the completion task and the narrative task (see Chapter 3). These tasks were executed by 25 unimpaired successive bilingual children (UI) between the ages of 5;0 and 8;11 years and 27 successive bilingual children with SLI (SLI) between the ages of 5;1 and 8;8 years (see Chapter 3). In this final chapter, the results of the two research tasks will be discussed in relation to the hypotheses and linked to the literature.

The outcome of each hypothesis is discussed separately: the effects of SLI on the production of 3rd sg is discussed in paragraph 7.2.1, followed by the effects of age on the production of 3rd sg in 7.2.2, the correlation between the two tasks is evaluated in 7.2.3 and, lastly, a conclusion is drawn about the diagnostic value of the 3 rd sg agreement marker. Paragraph 7.3 discusses three additional observations. The closing conclusions can be found in 7.4.

7.2. Hypotheses

7.2.1. SLI versus UI

Hypothesis 1: Successive bilingual children with SLI omit the 3rd sg agreement marker (-t) significantly more often than unimpaired successive bilingual children in the completion task.

The results of the data from the completion task in the present study provide evidence supporting this hypothesis (see Chapter 4). The successive bilingual children with SLI (5;1 - 8;8 years) omitted the 3rd sg agreement marker (-t) more often than the unimpaired successive bilingual children (5;0 - 8;11 years). Interestingly enough, one unimpaired successive bilingual child in particular, participant 227, omitted the (-t) substantially more than any other participant. The main effect of SLI in this present study corroborates the findings in previous studies done by Steenge (2006), Verhoeven et al. (2011) and de Groot (2016). However, the results of the data from the narrative task in this present study provide no evidence to support this hypothesis (see Chapter 5). In this context, the successive bilingual children with SLI did not omit the (-t) significantly more often than the unimpaired successive bilingual children. These results do not correspond with the results of previous studies done by Steenge (2006) and Verhoeven et al. (2011). The same applies to de Groot's (2016) study on

the narrative skills of 75 Dutch monolinguals (5;0 -12;0 years) with and without SLI. She found that monolingual SLI children omitted the (-t) significantly in the 3rd sg more often than the typically developing monolingual children.

A possible explanation for the different results in the two tasks may be the differences in their demands. A cognitively less complex task (more structured) such as the completion task may be less taxing in regards to processing capacity. This type of task is more structured and controlled than the narrative task, as participants are only required to insert one or two words in a predefined sentence structure (Julien, 2017). The narrative task is less structured and directive, as participants are required to formulate whole sentences without a restrictive sentence frame (Julien, 2017). Participants executing a narrative task also have to deal with various aspects of language such as morphological aspects (e.g., inflection), syntactic aspects (e.g., placement), semantic aspects (e.g., word retrieval), temporal aspects (e.g., tense) and aspectual nuances (Julien, 2017). According to Verhoeven et al. (2011), children executing a narrative task may not be able to perform at their actual language level.

7.2.2. Young versus Mid young

Hypothesis 2: Age has a positive significant effect on unimpaired successive bilingual children as well as on successive bilingual children with SLI in producing the 3rd sg agreement marker.

The results of the data from both tasks provide no evidence supporting this hypothesis. No age effect was found in the present study (see Chapters 4 and 5). In both tasks, the mid young successive bilingual children (SLI and UI) did not produce the 3rd sg agreement marker significantly more often than the young successive bilingual children (SLI and UI). In several cases, the young bilingual children performed equally or better than the mid young children (see participants 226-UI, 264-UI, 446-SLI and 409-SLI in Chapters 4 and 5). These results correspond with the results of a recent study by de Groot (2016). It should be noted that the children in de Groot's study were monolinguals with an age range of 5;6-12;0 years, whereas children in this present study are bilingual with an age range of 5;0-8;11 years. The results of this present study do not correspond with those of Verhoeven et al. (2011), who found an age effect. In that study, the seven-year-old participants produced significantly more omission errors than the nine-year-old participants. It should be noted that besides the omission of the 3rd sg other omission errors were included in those results. Furthermore, there is a difference in group size in comparison with this present study. A possible explanation for the results in both production tasks in this present study may be the relatively small number of participants and the unequal number of participants in the two age groups (YBC and MYBC). In the completion task, there

were fewer participants in the MYBC group (N=12) than in the YBC group (N=34). Thes same applies to the narrative task (MYBC N=13; YBC N=38).

7.2.3. Task correlation

Hypothesis 3: There is a strong positive correlation between the use of the 3rd sg agreement marker in the completion and narrative tasks.

The results of the correlation analyses between the narrative and completion tasks provide evidence supporting this hypothesis (see Chapter 6). There was a positive and significant correlation between the two tasks. Interestingly enough, the results suggest that the participants performed better in the narrative task. It was easier for the participants to produce 3rd sg in the narrative task than in the completion task. These results were quite surprising given the differences in task demands, also mentioned in previous studies (Verhoeven, 2011; Julien, 2017). As explained in paragraph 7.2.1, the narrative task is the more complex and less structured task, putting more demand on the processing capacity than the completion task (Julien, 2017). Due to these taxing demands, children performing a narrative task may not be able to perform at their actual language level (Verhoeven, 2011). Taking into consideration the differences in demands of both task, the less demanding task (completion task) would have been expected to be performed better than the narrative task.

7.2.4 Diagnostic maker

Hypothesis 4: The omission of the 3rd sg marker is such a strong distinction that it can be qualified as a diagnostic marker for SLI in successive bilingual children.

Although the results of the completion task in this present study reveals that successive bilingual children with SLI omit the 3rd sg agreement marker significantly more often than the unimpaired successive bilingual children, there is not enough evidence to verify that the omission of the 3rd sg marker is a diagnostic marker for SLI in successive bilingual children. Rice (2000) states that a diagnostic/grammatical marker of SLI should meet six criteria. We will discuss them in relation to the results obtained in the present study.

1. The grammatical features of the diagnostic marker show little variation among the unimpaired children at a certain age. This is, unimpaired children should show a close approximation of adult grammer. They would cluster at the upper end of the distribution.
    - There is little variation in the omission of the 3rd sg agreement marker (–t) amongst the young UI participant as well as mid young UI participants in both the completion and the narrative tasks. In both tasks the majority of the participants in the UI groups

clustered at the upper end of the distribution (See Figures 4.2, 4.3 in chapter 4 and figures 5.2 and 5.3 in chapter 5).

2. The impaired children (SLI) perform below the unimpaired children. They cluster at the lower end of the distribution.
    - This is not the case with the SLI participants in this present study. In both tasks, only a small number of SLI participants clustered at the lower ends. The majority of the SLI participants clustered at the upper end of the distribution with the UI participants (see Figures 4.2 in Chapter 4 and 5.2 in Chapter 5).
3. The diagnostic/grammatical markers have a high level of sensitivity and specificity.
    - The results of the completion task indicate a SLI effect in the production of the 3rd sg. The required level of high sensitivity (true positive) however can not be confirmed with the results of this present study, since several of the SLI participants attained correct scores equal or higher than the unimpaired participants. In addition, no effect of SLI was found in the narrative task. Furthermore, the required level of high specificity (true negative) can not be confirmed with the results of this present study, since several of the UI participants attained equal or lower correct percentage scores than the SLI participants. In this present study, the diagnostic marker of the 3rd sg omission is not sensitive enough (true positive) to clearly identify SLI in bilingual children nor specific enough (true negative) to clearly identify the unimpaired bilingual children.
4. The content of the test is essential in interpreting a child's language impairment. The grammatical knowledge gained from the test could, in turn, be used for language intervention.
    - The specificity is not high enough for a meaningful interpretation of the participant's impairment.
5. The child's performance is interpretable in terms of adult grammar. It is possible to see which errors continue as a child moves towards complete grammatical proficiency.
    - It is quite clear that the omission of the 3rd sg should not be present in adulthood grammar (Wijen et al., 1998; Bolm, 2003). However, no follow-up testing has been carried to track the participant's grammatical progress.
6. Diagnostic grammatical markers persist over time.
    - This characteristic could not be confirmed with this present study. No follow-up testing has been carried out on these participants.

7.3 Additional observations

There were relevant individual differences among the participants in this study. The first relavant observation with respect to individual differences is that there were several successive bilingual children with SLI who performed equal or even better than several unimpaired successive bilingual children. In some cases, they attained correct percentage scores of 80% and higher for the production of the 3rd sg, e.g. participants 413-SLI, 402-SLI, 446-SLI, 446-SLI and 409-SLI. These high correct percentage scores raise the question about the SLI diagnosis of these participants. As previously mentioned, testing and diagnosing a bilingual group of children for SLI is a rather complex task, and there are only a limited amount of standardized diagnostic tests available for bilingual children with SLI. Furthermore, speech therapists lack the knowledge of the SLI characteristics in non-Dutch languages (Julien, 2009). Blom (2009) and Orgassa (2009) reported difficulties in distinguishing bilingual language errors from SLI errors. Bilingual children might display language errors in their second language that resemble language errors made by monolingual children with SLI. This may lead to the misdiagnosis of bilingual children without SLI who receive unnecessary therapy or misdiagnosis of bilingual children with SLI who do not receive therapy (Blom 2009; Paradis, 2010; Lotem et al. 2015).

Although the SLI in these particular SLI participants may not have manifested itself by omitting the 3rd sg agreement marker, it may display itself as the substitution of the plural agreement marker by a singular marker (de Jong, 1999) or in other areas of the linguistic domain. Interestingly enough, attaining high accurate scores for the 3rd sg is not an unfamiliar occurrence for bilinguals with SLI. De Jong's et al. (2007) study found that Turkish-Dutch children with SLI attained an accuracy score of 93% for the correct usage of the 3rd sg.

Furthermore, one unimpaired successive bilingual in particular (227-UI) performed substantially worse than the majority of the participants including the SLI participant in both tasks. Are these results a product of undiagnosed SLI or bilingualism? Findings by Steenge (2006) and Orgassa (2009) indicate that difficulties in the subject-verb agreement are less affected by bilingualism effects and more severely affected by SLI effects.

The second relevant observation is that there were several UI and SLI bilingual children who produced a substantial amount of unclassifiable responses, e.g. participants 252-UI, 209-UI, 407-SLI, and 408-SLI. The majority of these unclassifiable responses consisted of sentence structures, which included a dummy auxiliary or a modal auxiliary (see Tables 4.4 and 5.4). These observations correspond to results found in Orgassa (2009). In that study, both unimpaired bilingual children, as well as bilingual children with SLI, made use of dummy auxiliaries. Various studies have shown that the use of dummy auxiliaries is not an isolated occurrence and it should be seen as a stage in the

acquisition of finiteness of verb inflection and verb placement (Van Kampen et al., 2000; Blom et al., 2011; Hollebrandse et al., 2013). Hollebrandse et al. (2013) believe that children keep using dummy auxiliaries for their morphosemantic and morphosyntactic advantages. According to Blom et al. (2011) a dummy auxiliary is inserted into a sentence as a strategy to reduce inflectional and derivational difficulties. This theory is supported by Julien (2017), who found that children with less exposure to Dutch (bilinguals) use more auxiliaries to reduce morphosyntactic complexities caused by verb type and class. De Groot (2016) found a significant positive correlation between the use of dummy auxiliaries and the omission of the 3rd sg agreement maker. It was concluded that an increase in dummy auxiliary usage leads to an increase in the omission of the 3rd sg agreement marker.

The third relevant observation is that the participants produced substantially more unclassifiable responses in the narrative task than in the completion task. As discussed the majority of these unclassifiable responses consisted of sentence structures which included a dummy auxiliary or a modal auxiliary (see Tables 4.4 and 5.4). A possible explanation for the different observations in the two production tasks may be the differences in elicitation method and tasks demands. As previously mentioned in 7.2.1, a cognitively less complex task such as the completion task may be less demanding in terms of processing capacity. According to Blom et al. (2011) and Julien (2017), children use the auxiliary insertion strategy presumably as a way of reducing processing difficulties caused by the increased number of task demands and complexities. In the case of this present study, the narrative task is the more complex task resulting in a higher production of auxiliaries in the unclassifiable responses than the completion task. It should be noted that differences in tasks demands and elicitation method are not the only factors that influence the use of (dummy) auxiliaries. Previous studies have shown that lenght of exposure to Dutch, verb type and verb class also play a role in the use of auxiliaries (Julien, 2017)

7.4 Conclusions

The completion task shows that successive bilingual children with SLI omit the 3rd sg agreement marker (-t) significantly more often than unimpaired successive bilingual children. This result corroborates those of Steenge (2006), Verhoeven et al. (2011) and de Groot (2016). However, no effect of SLI was found in the narrative task . These two different task results clearly indicate that there is a task effect (see Verhoeven et al., 2011; Julien, 2017).

No age effects were found in the two tasks. In both tasks, the mid young successive bilingual children (SLI and UI) did not produce the 3rd sg agreement marker significantly more often than the

young successive bilingual children(SLI and UI). These results corroborate those of de Groot (2016). However, the results of this present study do not correspond with those of Verhoeven et al. (2011), who found an age effect. A plausible explanation for the results in this study may be the relatively small number of participants and the unequal number of participants in the age groups. The number of participants in previous studies have been larger, with the groups more evenly divided (Verhoeven et al., 2011; Julien, 2017). No significant interaction effects between age and group were found.

There was a positive and significant correlation between the narrative and the completion tasks. Interestingly enough, these results point out that the participants performed better in the narrative task than in the completion task. These results were quite surprising given the fact that the narrative task is the more demanding, less structured and more complex task (Verhoeven, 2011; Julien, 2017). Although the results of the completion task in this present study found a SLI effect in the production of the 3rd sg, the results of this study were not outspoken enough to meet the requirements of a diagnostic marker of SLI (see Rice, 2000 in paragraph 7.2.4). There was not enough evidence to qualify the omission of the 3rd sg as a diagnostic marker.

Furthermore, there were three relevant observations on individual differences among participants in this study: (1) very high correct percentage scores among bilinguals with SLI, (2) the production of substantial amounts of unclassifiable responses with auxiliaries, and (3) lastly, more unclassifiable responses were produced in the narrative task than the completion task.

The limited number of participants and the size of the individual variation in this study call for interpreting the results cautiously. Replicating this study with larger and evenly divided groups would yield more reliable results. In addition, testing of the participants should be done by only one researcher in order to exclude variation in testing methods. The testing for the data used in this thesis, was done by four different researchers. As far as future research is concerned, the role that the verb class and the verb types play in the production of the 3rd sg should be investigated. In addition, individual differences such as the participant's native language L1, type of bilingualism and quality of language input need to be investigated in order to detect patterns that could affect the participant's abilities.

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Appendix 1: Inclusion- en exclusion criteria for the selection of the participants (in Dutch)

Alleen kinderen die aan onderstaande criteria voldoen, waren geschikt voor deelname aan het onderzoek:

1. Er is geen sprake van een cognitieve achterstand. Het IQ is 85 of hoger.
2. Er is sprake van een normaal gehoor, vastgesteld met o.a. audiometrie. Het gehoorverlies is niet groter dan 20 dB HL.
3. Er zijn geen grote gedragsproblemen zoals autisme of stoornissen in het autisme spectrum.
4. Bij de groep SLI-kinderen moet SLI gediagnosticeerd zijn door een multidisciplinair team volgens de criteria voor indicatiestelling cluster 2.
5. Er zijn geen ernstige spraakproblemen aanwezig.
6. Er is sprake van tweetaligheid. Drietalige kinderen werden uitgesloten van deelname.
7. De tweetalige kinderen mogen pas na een leeftijd van 2;6 jaar een regelmatig taalaanbod van het Nederlands hebben ontvangen. Daarnaast gebruiken zij consequent zowel het Nederlands als de moedertaal.
8. Kinderen van Turkse ouders moeten kinderen zijn van ouders die het Turks als moedertaal hebben. Kinderen van Koerdisch sprekende ouders werden uitgesloten van deelname.

Appendix 2: Anamnesis questionnaire (in Dutch)

Naam kind:	j / m
Geboortedatum kind:	
Hoogste opleiding vader:	
Hoogste opleiding moeder:	
Deze anamnese is ingevuld door:	
School en groep:	
Datum van deze anamnese:	

1. Algemene vragen over de ontwikkeling en gezondheid		
Is er sprake van een trage ontwikkeling in de moedertaal?[1]	ja	nee
Omcirkel het goede antwoord.		
Is er sprake van terugkerende gehoorproblemen?[2]	ja	nee
Is er sprake van een cognitieve achterstand?	ja	nee
Is er sprake van gedragsproblemen?	ja	nee

[1] Meertalige kinderen met een trage ontwikkeling in het Nederlands zonder dat er sprake is van een trage taalontwikkeling in de moedertaal zijn niet geschikt voor de groep kinderen met SLI van dit onderzoek. Ze zijn wel geschikt voor de groep zich normaal ontwikkelende NT2.

[2] Als er sprake is van terugkerende gehoorproblemen, een cognitieve achterstand en/of gedragsproblemen is het kind niet geschikt voor dit onderzoek.

2. Algemene vragen over het taalaanbod	
Is het kind Nederlandstalig?	ja nee
Is het Nederlands de moedertaal van moeder?[3]	ja nee
Is het Nederlands de moedertaal van vader?	ja nee
Is het kind meertalig?	ja nee
Zo ja, welke talen spreekt het kind?	……
Verliep het leren van de talen na elkaar?	ja nee
Als het leren van de talen na elkaar verliep; welke taal leerde het kind als eerste / tweede / derde?	1ste: …… 2de: …… 3de: ……
Op welke leeftijd kreeg het kind regelmatig Nederlands taalaanbod?[4]	0 jaar / 1 jaar / 2 jaar / 3 jaar / 4 jaar

[3] Eentalige kinderen waarbij vader en/of moeder een andere moedertaal heeft dan het Nederlands zijn niet geschikt voor dit onderzoek.

[4] Meertalige kinderen die regelmatig Nederlands taalaanbod kregen vóór het 2 ½ jaar zijn niet geschikt voor dit onderzoek.

3. De taalsituatie in het gezin	
Uit welk land komt de vader van het kind?	……
Wat is de moedertaal van de vader?[5]	……
Uit welk land komt de moeder van het kind?	……
Wat is de moedertaal van de moeder?	……
Welke taal spreken de ouders thuis onderling?	……
Welke taal spreekt de vader meestal met het kind?	……
In welke taal geeft het kind antwoord aan vader?	……
Welke taal spreekt de moeder meestal met het kind?	……
In welke taal geeft het kind antwoord aan moeder?	……
Welke taal spreken de kinderen in het gezin meestal onderling?	……
Wie is de belangrijkste verzorger van het kind?	……
Welke taal spreekt de verzorger met het kind?	……
Heeft de belangrijkste verzorger deze taal altijd met het kind gesproken?	……
Zo niet, welke taal sprak hij of zij eerst met het kind (bijvoorbeeld vóór het schoolbegin)?	……

[5] a. Kinderen van Koerdisch sprekende ouders zijn niet geschikt voor dit onderzoek.
b. Bij Marokkaanse kinderen is het belangrijk om te weten of de moedertaal van de ouder(s) Berbers of Arabisch is.

4. Inschatting taalbegrip vóór het schoolbegin	
Op welke manier kwam het kind vóór het schoolbegin in contact met het Nederlands? *U mag (alleen) bij deze vraag meerdere antwoorden omcirkelen.*	televisie / boeken / peuterspeelzaal / broers en/of zussen / buren
Verstond het kind Nederlands vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Verstond het kind Turks vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Verstond het kind Koerdisch vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Verstond het kind Berbers vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Verstond het kind Marokkaans-Arabisch vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Verstond het kind een andere taal vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Zo ja, welke taal verstond het kind vóór het schoolbegin?	……

5. Inschatting taalproductie vóór het schoolbegin	
Sprak het kind Nederlands vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Sprak het kind Turks vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Sprak het kind Koerdisch vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Sprak het kind Berbers vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Sprak het kind Marokkaans-Arabisch vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Sprak het kind een andere taal vóór het schoolbegin?	niets / enkele woorden / redelijk / goed
Zo ja, welke taal sprak het kind vóór het schoolbegin?	…….

Appendix 3: List of unimpaired participants

	Unimpaired Participant	AGE	AGE GROUP	Gender	NATIVE LANGUGE
1.	220	61 months, 5;1 years	Young bilingual	F	Arabic
2.	221	81 months, 6;9 years	Young bilingual	F	Arabic
3.	242	70 months, 5;10 years	Young bilingual	F	Arabic
4.	263	102 months, 8;6 years	Mid young bilingual	M	Arabic
5.	230	94 months, 7;10 years	Mid young bilingual	M	Berber
6.	251	68 months, 5;8 years	Young bilingual	F	Berber
7.	252	60 months, 5;0 years	Young bilingual	F	Berber
8.	262	74 months, 6;2 years	Young bilingual	F	Berber
9.	264	80 months, 6;8 years	Young bilingual	F	Berber
10.	201	79 months, 6;7 years	Young bilingual	F	Turkish
11.	202	78 months, 6;6 years	Young bilingual	M	Turkish
12.	203	81 months, 6;9 years	Young bilingual	M	Turkish
13.	204	89 months, 7;5 years	Mid young bilingual	M	Turkish
14.	205	76 months, 6;4 years	Young bilingual	F	Turkish
15.	206	95 months, 7;11 years	Mid young bilingual	F	Turkish
16.	207	87 months, 7;3 years	Mid young bilingual	M	Turkish
17.	208	61 months, 5;1 years	Young bilingual	M	Turkish
18.	209	75 months, 6;3 years	Young bilingual	M	Turkish
19.	210	107 months, 8;11 years	Mid young bilingual	M	Turkish
20.	213	70 months, 5;10 years	Young bilingual	F	Turkish
21.	214	60 months, 5;0 years	Young bilingual	F	Turkish
22.	225	68 months, 5;8 years	Young bilingual	M	Turkish
23.	226	74 months, 6;2 years	Young bilingual	M	Turkish
24.	227	68 months, 5;8 years	Young bilingual	M	Turkish
25.	415	60 months, 5;0 years	Young bilingual	F	Turkish

Appendix 4: List of SLI participants

	SLI Participant				
		AGE	**AGE GROUP**	**Gender**	**NATIVE LANGUGE**
1.	443	85 months, 7;1 years	Mid young bilingual	M	Arabic
2.	444	68 months, 5;8 years	Young bilingual	F	Arabic
3.	445	81 months, 6;9 years	Young bilingual	M	Arabic
4.	446	82 months, 6;10 years	Young bilingual	M	Arabic
5.	447	102 months, 8;6 years	Mid young bilingual	F	Arabic
6.	421	83 months, 6;11 years	Young bilingual	F	Berber
7.	423	78 months, 6;6 years	Young bilingual	M	Berber
8.	424	76 months, 6;4 years	Young bilingual	M	Berber
9.	425	82 months, 6;10 years	Young bilingual	F	Berber
10.	426	60 months, 5;0 years	Young bilingual	M	Berber
11.	427	106 months, 8;10 years	Mid young bilingual	M	Berber
12.	430	93 months, 7;9 years	Mid young bilingual	M	Berber
13.	401	103 months, 8;7 years	Mid young bilingual	M	Turkish
14.	402	98 months, 8;2 years	Mid young bilingual	M	Turkish
15.	403	80 months, 6;8 years	Young bilingual	M	Turkish
16.	405	83 months, 6;11 years	Mid young bilingual	F	Turkish
17.	406	81 months, 6;9 years	Young bilingual	F	Turkish
18.	407	64 months, 5;4 years	Young bilingual	F	Turkish
19.	408	73 months, 6;1 years	Young bilingual	M	Turkish
20.	409	78 months, 6;6 years	Young bilingual	M	Turkish
21.	410	79 months, 6;7 years	Young bilingual	F	Turkish
22.	411	72 months, 6;0 years	Young bilingual	M	Turkish
23.	412	62 months, 5;2 years	Young bilingual	F	Turkish
24.	413	65 months, 5;5 years	Young bilingual	F	Turkish
25.	414	65 months, 5;5years	Young bilingual	M	Turkish
26.	416	61 months, 5;1 years	Young bilingual	M	Turkish
27.	418	103 months, 8;7 years	Mid young bilingual	M	Turkish

Appendix 5: Overview of the items in the Sentence completion task (short version)

Practice items:

Stimulus	Expected response	Actual response
Eten/De zeehond **To eat** /The seal	eet (vis) eats (fish)	
Pakken/Pingu **To take** /Pingu	pakt (de bal) takes (the bal)	
Vasthouden /De zeehond **To hold** /The seal	houdt (de hengel)vast holds (the fishing rod)	

Test items:

Stimulus	Expected response	Actual response
Vangen/ Pingu **To catch**/ Pingu	vangt (een vis) catches (a fish)	
Geven/ Pingu **To give**/ Pingu	geeft sla (de zeehond) gives lettuce (to the seal)	
Drinken/ Pingu **To drink/**Pingu	drinkt (limonade) drinks (lemonade)	
Slapen/Pingu **To sleep**/Pingu	slaapt sleeps	
Vliegen/ De vogel **To fly/** The bird	vliegt flies	
Springen/ Pingu **To jump**/Pingu	springt (op en neer) jumps (up and down)	
Glijden/Pingu **To slide/**Pingu	glijdt the berg af slides down the mountain	
Klimmen/De zeehond **To climb/**The seal	klimt op het stukje ijs climbs on a piece of ice	
Kennen/De meneer **To know/**The gentleman	kent Pingu knows Pingu	
Voelen/De zeehond **To feel/**The seal	voelt pijn feels pain	
Schoppen/Pingu **To Kick**/Pingu	schopt de bal kicks the ball	
Kussen/Pingu **To kiss**/Pingu	kust zijn mama kisses his mom	
Zwaaien/De zeezond **To wave**/The seal	zwaait naar Pingu waves to Pingu	
Huilen/De zeehond **To cry**/The seal	huilt cries	
Tekenen/Pingu **To draw**/Pingu	tekent (een berg) draws (a mountain)	
Schaatsen/Pingu **To skate**/Pingu	schaatst (naar zijn vriendin) skates (to his friend)	

Appendix 6: Simple example of a coding a narrative task (in Dutch)

Verb	Picture	Sequence	Actual response	Code	Inflection code
trap oplopen	2	1	En hier is hij al bij de derde trap. Ja.	15	2
dicht doen	2	1	En hier deed hij de deur dicht.	13	5
geven	2	1	En toen pakte hij hem.	13	5
maken	2	1	En hier deed hij de oogjes erop en het hoofdje.	13	5
omkijken	2	1	En toen hier keek hij uit.	13	5
slapen	2	1	En toen ging hij zo doen en toen sliep hij.	13	5
springen	2	1	En hier ging hij.	13	5
staan	2	1	Hier ging Pingu+/. En staan.	13	5
vallen	2	1	En hier viel hij toen. Ja.	13	5
zitten	2	1	En toen / en toen ging hij erop. Ja?	13	5
cadeau krijgen	2	1	En hier had hij hem op tafel gedaan.	46	5
eten	2	1	En hier ging hij hem eten.	303	5
glijden	2	1	En toen ging hij hier glijden.	303	5
huilen	2	2	En hier werd hij // en hier ging hij nog huilen.	303	5
liggen	2	1	En Pingu ging er eerst op liggen. Ja.	303	5
plassen	2	1	En hier ging hij plassen.	303	5

Appendix 7: Coding system for the 3rd person singular (short version)

Index for Completion and Narrative task (CORRECT INFLECTION 3RD SG)					
CORRECT LEXICAL INFEICTION = CODE 1			**CORRECT AUXILIARY INFLECTION = CODE 2**		
Codes	**Verb**	**Example**	**Codes**	**Verb**	**Example**
3	Finiet:correcte vervoeging t.t.	Hij loopt (‘he walks’)	10	GAP werkwoord finiet	Hij gaat/of doet/(i.p.v. botst) tegen de boom; hem(‘he goes/he does instead of ‘he crashes/ stikes’)
5	Scheidbaar werkwoord niet gescheiden	Hij uitblaast de kaars (‘he blows out the candle’)	20	Zijn +INF van bedoeld werkwoord t.t	Hij is lopen (‘He is walk+INF’)
111	Ander werkwoord (vaak geleerd als ‘chunk’)	pijn heeft (‘ has pain’) (i.p.v.pijn voelen); kusje geeft (i.p.v. kussen)	25	Zijn+voltooid deelwoord t.t	is gelopen / *is gepakt (i.p.v. heeft gepakt)
			30	Gaan/komen +INF	gaat of komt lopen (‘He goes walk+INF of comes walk+INF’)
			36	Gaan+naar+INF	gaat naar lopen (‘He goes to walk+INF’)
			40	Hebben +INF	Hij heeft lopen (He has walk+INF)
			45	Hebben+ voltooid deelwoord (v.t.t./voltooid tegenwoordige tijd)	Hij heeft gelopen (‘He has walked’)
			50	Doen/maken +INF	Hij doet lopen (‘He does walk’)
			70	Zijn +aan het (aan te/ om te) + INF	Hij Is aan het/ aan te/ om te lopen (‘He is aan het walk+INF’)
			78	Zijn + bezig met/om+INF	Hij is bezig met lopen (‘He is busy with walking’)
			80	Zitten/staan/liggen/lopen + C + INF	Hij staat… te lopen (‘He is walk+INF)

			86	beginnen/starten/proberen (of ander werkwoord) (om/met) (te)+INF	Pingu begint te lopen (‘Pingu starts to walk’)
INCORRECT INFLECTION = CODE 3			**INCORRECT NO INFLECTION = CODE 4**		
Codes	**Verb**	**Example**	**Codes**	**Verb**	**Example**
1	INF (infinitive)	Lopen (‘to walk’)	2	Stam	Loop/hij loop (‘he walk’)
8	GAP werkwoord INF	Gaan, doen ‘Klaasje tegen boom gaan’ (‘To go, to do’)			
12	Voltooid deelwoord (past participle)	Gelopen (‘walked’)			
301	Gaan/komen +INF (to go/ come+INF)	Gaan of komen lopen (‘to go to come walk+INF’)			
805	Zitten + aan ‘t / om te / te + INF	Zitten aan te lopen			
UNCLASSIFIABLE = CODE 5					
Codes	**Verb**	**Example**			
6	Alleen partikel	Op ‘Pingu de trap op’ i.p.v. ‘Pingu loop de trap op’ Pingu up the stairs instead of Pingu walks up the stairs			
13	Finiet: correcte vervoeging o.v.t. (Correct finite past tense)	Hij liep (‘He walked’)			
14	Finiet: incorrecte vervoeging o.v.t. (incorrect finite past tense)	Hij loopte i.p.v. hij liep			
37	Incongruentie hulpwerkwoord onderwerp (Incongruence auxiliary subject)	Hij ga/gaan/gingen lopen(‘He go walk+INF’)			
46	Voltooid verleden tijd (v.v.t.) (past perfect tense)	Hij had gelopen (‘He had walked’)			

60	Kan/moet/mag/wil/zal +INF (Modal+ infinitive+ present tense or past tense)	kan/kon; moet/moest; mag/mocht; wil/wilde; zal/zou lopen ('He could/must/may/will/shall walk+ INF')
100	Chunk of imperatief	Chunk or imperative
104	Herhaling van uiting van gesprekspartner	Repetation of speech utterance
201	Zijn +INF van bedoeld werkwoord (to be +infinitive+v.t)	Hij was lopen was ('He was walk+INF')
205	Zijn +voltooid deelwoord v.t. (to be+past perfect tense)	was gepakt /was gelopen (i.p.v. had gepakt) ('He was caught')
303	gaan/komen +INF	ging of kwam lopen (He went walk+INF)