

The production of pronouns in Dutch children with developmental language disorders: A comparison between children with SLI, hearing impairment, and Down's syndrome

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Abstract

The production of pronouns in spontaneous language was investigated in three groups of children with Developmental Language Disorders (DLD): children with Specific Language Impairment (SLI), children with hearing impairment (HI), and children with Down's syndrome (DS). The results were compared to the production of pronouns in typically developing children, matched on MLU. The number of pronouns produced did not differ significantly between the groups. In the order of production of pronouns, more commonalities than differences were found between the three DLD groups and compared to typically developing children. The number of errors in all groups appeared to be very low and all groups showed a significant correlation between the increase in MLU and the production of pronouns. The results are presented in relation to the discussion of whether children with DLD with different aetiologies show a difference in language behaviour.

Keywords: *Specific language impairment, language disorders, Down's syndrome, language disorders, hearing disorders*

Introduction

Specific language impairment as a unique language disorder?

Researchers in the field of Developmental Language Disorders (DLD) sometimes show an inclination to consider only children with Specific Language Impairment (SLI) and claim that certain linguistic characteristics are found only in these children's language performance and comprehension. Recently, research has begun to examine language development in more than one group of children with language disorders. Redmond (2005) has researched sentence recall, non-word repetition, and tense marking in children with ADHD and with SLI, as well as in typically-developing children, and has provided the rationale for conducting research where more than one group of children with language disorders are compared:

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These comparisons between affected groups are of considerable theoretical interest because they allow us to evaluate the extent to which the psycholinguistic profile associated with SLI is unique to SLI, or if the weakness in sentence recall, non-word repetition, and tense marking observed in SLI index a common discomposure of language that is associated with many kinds of developmental disruption (Redmond, 2005: 110).

The author concludes that these three identified clinical markers of SLI have also been observed in other clinical populations.

Research comparing the linguistic abilities in children with different kinds of language disorders has shown different outcomes. In some studies, differences between groups have been reported. Clahsen and Almazan (2001) found that children with Williams Syndrome exhibit higher over-regularization rates in the production of *-ed* past tense forms of either existing or novel verbs than children with SLI. Other researchers, on the other hand, have found more commonalities than differences. In one study, Laws and Bishop (2004) compared the linguistic abilities of children with SLI and Down's syndrome and suggested similar patterns of language impairment in the two populations, as well as some similarities in underlying processing deficits. Less clear-cut results have been reported as well. In comparing children with hearing impairment and children with SLI, Norbury, Bishop, and Briscoe (2001) found that on average the children with hearing impairment outperformed the children with SLI on the production of finite verb morphology. However, the youngest children with hearing impairment appeared to have more difficulty with tense marking than the older children in the group and, as a consequence, behaved more like the children with SLI.

Bol and Kuiken (1990) compared the production of morphosyntax in Dutch children with DLD across different aetiologies: SLI, hearing impairment, and Down's syndrome. The results showed that there were more commonalities than differences between the three groups. The differences that could be observed between the groups of DLD children mainly concerned the degree to which their morphosyntactic development was affected, e.g. the omission of sentence subjects was more frequent in the group with Down's syndrome compared to the children with hearing impairment, who produced fewer sentence subjects than the children with SLI. Therefore, the differences were quantitative rather than qualitative.

The morphosyntactic aspects researched in Bol and Kuiken (1990) (structures on clause and phrase levels and morphological structures) were rather broad. The authors looked at the production of pronouns as well, and found that, in all three groups of children, the use of the pronominal system was problematic. All three groups of children with DLD showed significantly fewer pronouns in their spontaneous language compared to typically developing children of the same mental age. However, the children with SLI performed better (i.e. produced more pronouns) than those with hearing impairment, who in turn outperformed the children with Down's syndrome in their production of pronouns.

The production of pronouns in typically-developing children

The development of personal pronouns requires the mastery of syntactic and morphological distinctions, as well as of a range of semantic and pragmatic features (Chiat, 1986), and may therefore be a difficult form for young children to readily acquire, particularly for children with Developmental Language Disorders. Children acquiring personal pronouns must not only learn to isolate each pronominal form and determine the syntactic distribution of each of these pronouns, but they must also determine the referent or speech

role semantically encoded in each pronominal expression (Chiat, 1986). The role of ‘speaker’ is encoded in the first person (1P) pronominal forms *I, me, my, mine*, whereas the role of the ‘addressee’ is represented in second person (2P) forms *you, your, yours*. On the other hand, third person (3P) forms identify non-participants—neither the addressee nor the speaker—and are differentiated from each other in terms of animacy, with respect to the inanimate pronoun ‘it’, and in terms of gender, as in the case of masculine and feminine forms, *he, him, his; she, her, and hers* (Chiat, 1986). The relative use of each personal pronoun is also constrained by certain pragmatic requirements; where the referent is the speaker or addressee, the reference must be a pronominal form and not a full nominal expression, as it is not appropriate for a speaker to refer to himself or to his addressee using a proper name. However, references to non-participants may either be expressed in the form of a full NP or as a pronoun replacing that NP, depending on the linguistic and pragmatic context (Chiat, 1986).

A major reason for which the acquisition of personal pronouns has interested researchers is the fact that, unlike the nominal elements that they stand for, pronouns have unstable referents (Clark, 1978; Ricard, Girouard, and Gouin-Decarie, 1999). Children acquiring personal pronouns must realize that these pronominal forms shift reference depending on the context, and refer to different individuals with every change of speaker in a conversation. In other words, a child must understand that ‘I’ does not always refer to him/herself, but can also refer to the person he/she is interacting with, when that person is the speaker. On the other hand, non-pronominal nominal expressions are fixed in reference and identify the same individual, regardless of who is speaking (Chiat, 1986).

This shift in reference is a crucial aspect in the study of pronoun acquisition in children, and can reflect children’s conceptual representations of pronouns during their early stages of pronoun production. On the one hand, if children correctly grasp the salient and stable relationship between pronouns and their speech roles, as the *speech-role hypothesis* suggests (Clark, 1978), then children will understand the correct meaning of pronouns from early on and will not confound the meaning of different pronouns. Therefore, according to this view, pronoun reversals (e.g. the substitution of 1P pronouns for 2P pronouns and vice versa) should not occur in their language production. On the other hand, if children consider personal pronouns to consistently refer to particular individuals irrespective of the changing speech context, as the *name hypothesis* presumes (Clark, 1978), then children may ignore the shifting reference of pronouns during early stages of acquisition. Instead, they may treat them like proper names representing a specific individual, and this may result in systematic pronoun reversal errors.

Although group studies with large samples of children have indicated that pronoun reversal is a rare phenomenon in children’s speech (Charney, 1980; Chiat, 1986), some studies have provided evidence for the *name hypothesis* by showing that some pronoun reversals do occur (Oshima-Takane, 1992; Girouard, Ricard, and Gouin-Decarie, 1997). The systematic errors that children make in expressing certain pronominal forms have been widely investigated, with the expectation that such errors will shed light on the ways in which children might learn to infer the semantic and pragmatic concepts encoded in pronouns, and how their understanding of these distinctions develops over the course of pronominal acquisition.

Researchers have focused on examining the gradual emergence of each pronominal form in children’s productive language, and have attempted to describe the order in which different pronouns are acquired. The underlying assumption is that forms which appear first in child language must be less complex and easier to acquire, whereas forms that are

last to emerge or which are consistently prone to errors are more difficult for young children, and presumably even more challenging for language-impaired children.

Naturalistic studies examining language production in English have found that children begin to use 1P pronouns earlier than other personal pronouns, with the 2P pronoun following closely (Brown, 1973; Chiat, 1986). Brown (1973) also reported that the contexts in which pronouns were produced tended to match the distribution of the corresponding NPs—for example, 'it' tended to appear post-verbally first, in the same position as inanimate object NPs. This finding also corresponds with Angiolillo and Goldin-Meadow's (1982) results on the post-verbal occurrence of the 3P 'it'. Thus, it seems from these findings that the first pronouns produced by children tend to be limited to specific contexts, rather than to occur in their full adult distribution.

A similar trend of pronoun acquisition was observed in a longitudinal study by Chiat (1978). Children between the ages of 2–3 years were observed over a period of time ranging from 7 months to 2 years in a naturalistic play setting. Chiat (1978) reported that the 1P pronoun, followed by the inanimate 3P pronoun 'it', were the first pronouns to be frequently produced, followed by other 3P pronouns. In some cases, however, the emergence of 2P and 3P pronouns was nearly simultaneous. In fact, other studies have consistently reported that, following the 1P pronoun and the inanimate 'it' pronoun, the 2P form is in advance over other pronominal forms and emerges before other 3P forms are frequently produced (Chiat, 1986).

With respect to the 3P pronouns, the fact that 'he' and 'she' forms emerge later may be due to the greater semantic and morphosyntactic complexity associated with these forms compared to 'it', since the animate pronouns are marked for gender and case, whereas 'it' is invariable. An alternative hypothesis is that children may prefer to substitute 3P animate referents with fully expressed NPs, which is impossible to do with 1P and 2P pronouns (Chiat, 1986). However, this hypothesis cannot entirely explain why 'it' emerges nearly as early as the 1P pronoun does, since children may choose to produce a NP instead of 'it' as well, both when 'it' occurs pre-verbally and post-verbally.

An alternative hypothesis accounting for the order of mastery of personal pronouns, aside from a linguistic explanation, is an account more cognitive in nature. Factors such as the child's early egocentric views, the development of a sense of self and of others, or the ability to engage in joint attention have been considered to play an important role in the acquisition of personal pronouns (Bates, 1990), since they all relate to the child's capacity to understand others and their minds (Ricard et al., 1999). Given that the acquisition of personal pronouns requires the capacity to identify and shift roles with another person in the conversation and to coordinate different perspectives such as those of the speaker, the addressee, and the non-participant, it is possible that the acquisition of personal pronouns is related to children's perspective-taking abilities. Studies have tested the relationship between early perspective-taking skills and the gradual development in production of 1P and 2P pronouns. In a longitudinal study of children aged 1;10 to 3;3, Loveland (1984) reported that only children who succeeded in mastering different points of view were able to correctly understand and produce 1P and 2P pronouns. In a more recent longitudinal study by Ricard et al. (1999), it was shown that children's performance on perspective-taking tasks was significantly correlated with the order of pronoun acquisition. More specifically, their competence in coordinating two perspectives preceded the full mastery of 1P and 2P personal pronouns, while competence in coordinating three perspectives was required for 3P pronouns to be fully acquired. Taken together, these findings may suggest, as stated by Loveland (1984), that understanding spatial points of view is a cognitive

prerequisite to understanding speaker's point of view, which governs the pragmatics of I/you pronouns.

In sum, there have been several linguistic and socio-cognitive factors that have been argued to affect the order of acquisition of 1P, 2P, and 3P personal pronouns in young children. The most consistent observation is that the early emergence of the 1P pronoun is well-established among children learning English (Clark, 1978; Chiat, 1986) as well as in children acquiring other languages (French: Girouard and Oshima-Takane, 1991; Hebrew: Rom and Dgani, 1985). In order to examine the order of production of pronouns in typically developing Dutch children, Bol and Kuiken (1986) adopted a cross-sectional research design with children from 1–4 years of age. The authors took as a criterion for production that a pronoun must be produced by at least one child in the group with a frequency of at least four out of 100 analysable spontaneous utterances in order to determine a minimum cut-off to measure the productivity of the pronouns.

Bol and Kuiken (1986) established the following order of pronouns produced in the spontaneous language of 36 children who were recorded in their homes, while talking in an everyday situation with a parent, usually the mother, for at least three quarters of an hour. In Bol and Kuiken's study, demonstrative pronouns were produced first (1;2 years), followed by personal pronouns in subject form (2;5 years). One of the results was that the first, second, and third person singular reached the criterion at almost the same time. After the age of 2;5 years, the picture becomes less clear. The interrogative pronoun *wat* (what) reached criterion for production at ~2;8 years, while *wie* (who) and *welke* (which, what) were used later, but never reached the criterion. Personal pronouns (object form) were used much less frequently than the subject forms. The first form to be produced was *mij* (me), followed by *hem* (him) between 2;5 and 3;5 years. Female forms are not produced at all, while the plural form is used only once. The possessive pronouns *mijn* (mine) reached criterion at 2;7 years of age, followed by *zijn* (his) at 3;5 years. Like female and plural forms, the second person singular of the possessive pronouns was also produced very rarely. Indefinite pronouns did not reach criterion and were seldomly produced from the age of 3;3 years. Relative pronouns appeared to be used even later, as shown in one child who produced a relative pronoun on one occasion at ~4;0 years of age. On the whole, Caselli, Casadio, and Bates (1999) found the same production order for pronouns in English and Italian typically-developing children.

The early acquisition of the 3P 'it' pronoun has also been reliably reported in young children's productive language. On the other hand, results remain less clear-cut when it comes to the exact order of acquisition in the remaining 3P and 2P pronouns. Although results from both naturalistic and experimental studies have demonstrated that the order in which these remaining pronouns emerge is not as fixed and predictable as 1P and the inanimate 3P pronouns, there seems to be a fair amount of research that points to the greater complexity of 3P pronouns, both from a linguistic and cognitive point of view, and suggests that, most often, 3P pronouns other than the inanimate 'it' would be acquired last.

The production of pronouns in children with developmental language disorders

The order of personal pronoun acquisition has also been investigated in language-impaired children such as children with SLI. Children with SLI have been shown to be delayed in their development of certain pronominal forms (cf. Leonard, 2000). Research examining children's errors in the production of pronominal forms has also revealed that SLI children often have difficulty with certain nominative case pronouns and produce accusatives

instead of nominative forms, particularly for 3P pronouns, resulting in sentences such as 'him sick' or 'her eating' (Leonard, 2000). This difficulty with mastering 3P pronouns at a rate comparable to typically-developing children has also been suggested in a study by Loeb and Leonard (1991), which showed that errors with pronoun case marking 3P pronouns were more common in children with SLI than in their normally-developing peers matched on MLU. Furthermore, Moore (2001) reported that errors involving the 3P feminine pronoun, which is marked for gender compared to the default 'he' or unmarked 'it' pronouns, were more prevalent than errors involving the masculine form. Dutch children with SLI showed a significantly less frequent use of personal (subject and object form) and possessive pronouns, compared to typically developing children matched on MLU (Bol and Kuiken, 1990). Similarly Schelletter (1990) looked at indefinite and personal pronouns and found that English children with SLI used forms that were produced by typically-developing children who were 2–4 years younger.

The acquisition of personal pronouns in atypical populations has also been examined from a more social-cognitive perspective, in terms of these children's knowledge of others' perspective. In one study, young autistic children between 1;0 and 2;0 years of age were shown to have difficulty with pronoun reference and frequently made reversal errors in their production (Lee, Hobson, and Chiat, 1994). These difficulties were interpreted to be the result of an under-developed theory of mind, a deficient sense of one's and of other's selves (Lee et al., 1994), and of a limited perspective-taking ability. Autistic children have also been shown to have deficient joint attention skills and to have difficulty identifying and maintaining a point of joint focus with the other person involved in the interaction (Baron-Cohen, 2001).

Recent research has found that the developments of visual perspective-taking abilities and of theory of mind are also delayed in children with SLI (see Farrant, Fletcher, and Maybery, 2006 for a review). It has been argued that these skills are crucial in the development of language, as they allow for the processing of a point of view different than one's own and of the ability to share another person's perspective, an important skill for linguistic conversation (Farrant et al., 2006). Thus, it is possible that the delays and systematic errors observed in SLI children's acquisition of personal pronouns may reflect their limited perspective-taking skills as well as more linguistic difficulties associated with the complexity of some forms.

Pronoun acquisition has also been investigated in children with hearing impairment. Bol and Kuiken (1990) reported that children with hearing impairment (HI) produce significantly fewer personal and possessive pronouns in their spontaneous language compared to typically-developing children with the same mental age. In a study on the production of first and second person pronoun development in two children with hearing impairment, Cole, Oshima-Takane, and Yaremko (1994) concluded that the use of the pronouns are within normal expectations for hearing age and linguistic level, and slightly delayed in terms of chronological age. In sum, the results from research on the use of pronouns in children with hearing impairment are somewhat contradictory.

A study by Bol and Kuiken (1990) examining the spontaneous language production of Dutch children with Down's syndrome revealed that these children produced fewer pronouns compared to typically-developing children with the same mental age. In this study, the children with Down's syndrome had difficulty producing personal pronouns, possessive pronouns, and interrogative pronouns. Jenkins (1993) examined the language skills in children with Down's syndrome, and children with learning difficulties without Down's syndrome. Their language outcomes were compared to those of typically developing children matched for verbal comprehension skills. The author stated that:

Although the children with Down's syndrome produced as many utterances as the other two groups, their language contained significantly fewer Stage III and IV structures (i.e. structures of typically developing children between 2;0 and 3;0 years of age). They also showed a deficit in pronouns and auxiliary verbs used in comparison with the other two groups (Jenkins, 1993: 10).

Perovic (2002) looked at the comprehension pattern on pronouns presented by four girls with Down's syndrome. The author concluded that her study provided evidence against the claim that language development in Down's syndrome is severely delayed but essentially non-deviant.

In sum, the personal pronoun acquisition literature on normally-developing children as well as on children with atypical language development seems to support the relative ease of acquisition of 1P 'I' as well as 3P inanimate 'it', but predicts some difficulty in the acquisition of the other 3P singular forms, particularly the feminine form 'she', and reports greater production errors for the 3P such as the substitution of the nominative case with the accusative pronoun. Results are inconsistent with respect to the 2P pronoun 'you'; several studies have reported the emergence of 'you' to follow shortly after the acquisition of 'I', whereas other studies have discussed difficulties and reversal errors associated with 1P and 2P forms, especially due to the shifting roles of speaker and addressee encoded in these pronouns in a given linguistic context.

Bol and Kuiken (1986; 1990) did not discuss the acquisition of pronouns in detail and, moreover, the group comparisons were made in such a way that there was no possibility to see whether different levels of morphosyntactic ability would influence the use of pronouns in the children. The present research aims to extend the previous studies by Bol and Kuiken and to provide a detailed examination of the production of pronouns in spontaneous language in the same three groups of children with Developmental Language Disorders, related to their morphosyntactic abilities, as indicated by their MLU-level.

Research questions

From the literature it becomes clear that typically-developing children go through certain stages in mastering the pronominal system. Children with Developmental Language Disorders have problems in mastering this system. What is unknown in mastering pronouns is whether they develop a deviant pronominal system in their productive language and whether children with Developmental Language Disorders with different aetiologies show a difference in language behaviour in this respect. Therefore, the research questions that the present study addresses are:

- (1) Is there a quantitative difference between the pronouns used in spontaneous language by typically-developing children and children with SLI, hearing impairment, and Down's syndrome?
- (2) Is the order of production of pronouns in three groups of children with Developmental Language Disorders (DLD) comparable to the pattern observed in typically-developing children?
- (3) Is there a quantitative or a qualitative difference in the errors that the three groups of children with DLD make in the production of pronouns, compared to typically-developing children?
- (4) Do the children with DLD show a similar trend as typically-developing children with respect to the increase in the number of pronouns produced in relation to the increase of age and to the increase of MLU?

The Dutch pronouns researched in this article are: *demonstratives* (not used as a determiner), *personal pronouns* (subject and object forms), *interrogative pronouns*, and *possessive pronouns* (see Table I).

Data collection and subjects

The data and method come from Bol and Kuiken (1986) (see also Bol and Kuiken, 1990). All children were audio-recorded. The audiotapes were transcribed orthographically and, for each child, 100 consecutive analysable utterances were taken to count the number of produced pronouns, following the classification indicated in Table I, The Dutch pronominal system. Utterances that contained unintelligible (parts of) language were excluded from the number of 100 utterances, as well as minors (*yes, no, thank you*) and self-repetitions.

The typically-developing children (n=15) were recorded at home, with one parent and the investigator present during a free-play interaction. Their age range was 2;5 to 3;3 years of age. The children with DLD were recorded at their schools, talking to their speech therapist in a non-therapeutical conversation, while the investigator took part in the conversation every now and then. In both settings the conditions were the same: the children were interacting with a familiar person and an unfamiliar one, the investigator.

The children with Specific Language Impairment (n=18) ranged in age from 4;8 to 8;2 years (average age: 5;11 years). They had difficulties in language production in the presence of normal hearing, showing age-appropriate scores on non-verbal tests of intelligence; and had no obvious signs of neurological or socio-emotional impairment (cf. Leonard, 2000).

The children with hearing impairment (n=20) ranged from 3;10 to 9;1 years of age (average: 5;11 years). The hearing impairment was diagnosed before 1;6 years and they suffered sensorineural or mixed hearing losses. The hearing loss was between 40–85 dB pure tone average on the better ear, with an average hearing loss of 65.8 dB. Intelligence scores are within the normal range for all HI children.

The children with Down's syndrome (n=14) ranged in age from 8;4 to 18;11 years (average age: 14;4 years). Their average mental age is 5;8 years. Their IQ ranges from 20–56, with a mean IQ of 40.7, measured by a Dutch adaptation of the Stutsman Preschool Performance Test (Smulders, 1963).

Each of the four groups of children was sub-divided into three sub-groups based on MLU. The groups of children were matched on MLU counted in morphemes, in such a

Table I. The Dutch pronominal system.

demonstratives	deze : referring to people and objects near, if the referent is not neuter or plural— <i>this, these</i> die : referring to people and objects not near, if the referent is not neuter or plural— <i>that, those</i> dit : referring to people and objects near, if the referent is neuter and singular— <i>this</i> dat : referring to people and objects not near, if the referent is neuter and singular— <i>that</i>
personal pronouns (subject)	Singular: ik — <i>I</i> ; jj , je — <i>you</i> ; hij , zij , het — <i>he, she, it</i> Plural: wij , we — <i>we</i> ; jullie — <i>you</i> ; zij , ze — <i>they</i>
personal pronouns (object)	Singular: mij , me — <i>me</i> ; jou , je — <i>you</i> ; hem , haar , het — <i>him, her, it</i> Plural: ons — <i>us</i> ; jullie — <i>you</i> ; ze , hen , hun — <i>them</i>
interrogative pronouns	wat — <i>what</i> ; wie — <i>who</i> ; welke — <i>which</i>
possessive pronouns	Singular: mijn — <i>my</i> ; jouw , je — <i>your</i> ; zijn , haar — <i>his, its, her</i> Plural: ons , onze — <i>our</i> ; jullie — <i>your</i> ; hun — <i>their</i>

Table II. Subjects.

	n	Mean age	Mean MLU
Typically-developing children (n=15)			
TD I	5	2;05	2.5
TD II	6	2;11	3.7
TD III	4	3;03	4.3
Children with SLI (n=18)			
SLI I	5	5;07	2.4
SLI II	7	5;06	3.5
SLI III	6	6;03	4.4
Children with HI (n=20)			
HI I	9	6;06	2.3
HI II	7	5;07	3.5
HI III	4	6;09	4.4
Children with DS (n=14)			
DS I	4	12;01	2.5
DS II	8	15;02	3.3
DS III	2	16;09	4.9

way to create three MLU groups (see Table II) and to equate them on morphosyntactic ability in order to compare their pronoun production. The first MLU group has a mean MLU below 3.0, the second MLU group a mean MLU between 3.0–4.0, and the mean MLU of the third group is bigger than 4.0.

Results

Research question 1: Number and type of pronouns

To see whether there was a difference between the four groups in produced pronouns if both the MLU classification and the total number of pronouns were taken into account, two statistical procedures were applied: the Kruskal-Wallis Test and, if necessary, the Mann-Whitney U-test, the non-parametric equivalents for the one-way ANOVA and the independent T-test, respectively. The total number of pronouns produced by the typically developing children (144) exceeded the number of any of the other groups of children with DLD. Children with SLI used a similar number as the typically-developing children and appeared to use more pronouns (140) compared to the other two groups (HI=117 and DS=118); however, this was not a significant difference (Kruskal-Wallis test, $\chi^2=5.460$, $df=3$, $p=.141$). For the total number of different pronouns, no between-group testing with the Mann Whitney U-test was employed given the non-significant results of the Kruskal-Wallis test. By far the subject forms of the personal pronouns were used most frequently. The mean number of the pronouns produced in each MLU group of all four groups of children is reported in Table III.

The results indicated that the only significant difference was found in the group of MLU ranging from 3.0–4.0 on the total number of produced demonstrative pronouns ($\chi^2=11.248$, $df=3$, $p=.010$). The results of the Kruskal-Wallis Test are reported in Table IV. This difference was caused by the children with DS, who produced only five demonstrative pronouns, compared to the 11–18 pronouns used by the children in the other three groups (Table III).

Table III. Mean number of produced pronouns in each MLU group.

Group	Demonstrative	Personal (subject)	Interrogative	Personal (object)	Possessive	Total
TD I	12	13	0	2	1	28
TD II	18	26	1	2	2	49
TD III	12	39	6	3	7	67
						144
SLI I	14	16	2	2	1	35
SLI II	17	27	1	3	2	50
SLI III	19	30	3	2	1	55
						140
HI I	7	10	2	0	0	19
HI II	11	24	4	1	1	41
HI III	20	31	1	3	2	57
						117
DS I	7	13	1	1	0	22
DS II	5	27	2	4	2	40
DS III	9	33	2	4	8	56
						118

I=MLU<3; II=3≤MLU<4; III=MLU>4.

Research question 2: Order of production

As a criterion for production, a pronoun had to be produced by at least one child of the group with a frequency of at least four out of 100 analysable spontaneous utterances (cf. Bloom, 1970). Demonstrative pronouns were the first to reach the production criterion, although subjective pronouns were used more frequently. If the criterion was reached, a letter is marked in Tables IV–VIII, where *t* stands for the typically-developing children, *s* for the children with SLI, *h* for the children with hearing impairment, and *d* for the children with Down’s syndrome. If the letter is in italics, the criterion was reached in the previous MLU stage, but not in the stage where the letter of the group is shown. It was assumed that if a child was able to produce a certain pronoun in a MLU stage, he or she would produce it

Table IV. Kruskal-Wallis tst on total numbers of different pronouns (a=Kruskal-Wallis Test, b=Grouping variable: kind of disorder).

	TOTALL	TOTDEM	TOTSUBJ	TOTINTER	TOTOBJJ	TOTPOS
I MLU<3 (a,b)						
Chi-square	3.315	3.357	2.439	2.336	1.579	4.025
df	3	3	3	3	3	3
Asymp. sig.	.346	.340	.486	.506	.664	.259
II MLU≥3 and MLU<4 (a,b)						
Chi-square	3.149	11.248	1.510	.932	5.072	2.136
df	3	3	3	3	3	3
Asymp. sig.	.369	.010*	.680	.818	.167	.545
III MLU>4 (a,b)						
Chi-square	2.523	3.444	1.496	6.348	.976	6.975
df	3	3	3	3	3	3
Asymp. sig.	.471	.328	.683	.096	.807	.073

* p<.05.

TOTALL: Total number of all pronouns; TOTDEM: Total number of demonstrative pronouns; TOTSUBJ: Total number of personal pronouns (subject); TOTINTER: Total number of interrogative pronouns; TOTOBJJ: Total number of personal pronouns (object); TOTPOS: Total number of possessive pronouns.

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Table V. Order of production: demonstrative pronouns.

MLU<3	t s d	t s h	t s h d	t s h d
3 ≤ MLU < 4	t s d	t s h d	t s h d	t s h d
MLU > 4	t s h d	t s h d	t s h d	t s h d
	<i>deze</i>	<i>die</i>	<i>dit</i>	<i>dat</i>
	this/these	that/those	this	that

t=typically developing; s=sli; h=hearing impaired; d=Down's syndrome.

as well in the next MLU stage. However, it might be the case that, due to factors during the conversation, the production of a particular pronoun was not necessary. It appears that there was no difference in the order of production of the demonstrative pronouns between the four groups: they follow the same developmental path (see Table V).

Subject forms of personal pronouns were the second to reach the production criterion. No differences were observed among the four groups of children. It was striking to see that the first, second, and third person singular pronouns reached the production criterion in all groups of children in all MLU stages (see Table VI).

The third kind of pronouns produced were interrogatives. The children with SLI and hearing impairment seem to be ahead of the children with Down's syndrome and the typically-developing children on the pronoun *wat* (what). Children with Down's syndrome and children with hearing impairment were ahead of children with SLI and typically-developing children on the pronoun *wie* (who), although no clear pattern of production was apparent (see Table VII).

The pattern of production of object forms of personal pronouns was somewhat vague. Children with hearing impairment did not reach the production criterion at all. There seems to be no clear pattern in the production of these pronoun forms in any group (see Table VIII). Typically-developing children used *mij* (me) earlier on than children with Developmental Language Disorders.

Table VI. Order of production: personal pronouns (subject).

MLU<3	t s h d	t s h d	t s h d					
3 ≤ MLU < 4	t s h d	t s h d	t s h d			t s h d		
MLU > 4	t s h d	t s h d	t s h d	s	t s h d		s h d	
	<i>ik</i>	<i> jij/je</i>	<i> hij</i>	<i> zij</i>	<i> het</i>	<i> wij/we</i>	<i> jullie</i>	<i> zij (plur)</i>
	I	you	he	she	it	we	you	they

t=typically developing; s=sli; h=hearing impaired; d=Down's syndrome.

Table VII. Order of production: interrogative pronouns.

MLU<3	s h	d	
3 ≤ MLU < 4	t s h d	h d	
MLU > 4	t s h d	h d	
	<i>wat</i>	<i>wie</i>	<i>welke</i>
	what	who	which

t=typically developing; s=sli; h=hearing impaired; d=Down's syndrome.

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Table VIII. Order of production: personal pronouns (object).

MLU<3	t								
3 ≤ MLU < 4	t s	s d	s		d				
MLU > 4	t s	t s d	s		d				
	<i>mij</i>	<i>jou</i>	<i>hem</i>	<i>haar</i>	<i>het</i>	<i>ons</i>	<i>jullie</i>	<i>ze/hen</i>	
	me	you	him	her	it	us	you	them	

t=typically developing; s=sli; h=hearing impaired; d=Down's syndrome.

Table IX. Order of production: possessive pronouns.

MLU<3								
3 ≤ MLU < 4	s d							
MLU > 4	t s h d		t					
	<i>mijn</i>	<i>jouw</i>	<i>zijn</i>	<i>haar</i>	<i>ons/onze</i>	<i>jullie</i>	<i>hun</i>	
	my	your	his/its	her	our	your	their	

t=typically developing; s=sli; h=hearing impaired; d=Down's syndrome.

The possessive pronouns were produced later than all other forms. There was no systematic pattern to be seen in the production of these pronouns, other than for *mijn* (my) which all groups used by MLU > 4 (see Table IX).

Research question 3: Errors

Errors were rare for the typically-developing children, a reversal of personal pronouns (e.g. *jij* (you) instead of *ik* (I)) occurred four times. The children produced an incorrect demonstrative pronoun on three occasions, e.g. *deze* (this) instead of *die* (that). The percentage errors of all typically-developing children was low: 4.9% (seven errors in 144 pronouns).

The children with SLI used an incorrect case of personal pronoun on 11 occasions, i.e. *object form* instead of *subject form*. Nine times other incorrect forms were produced, e.g. a *personal pronoun* instead of a *possessive pronoun*. The percentage errors of all children with SLI was 14.3% (20 errors in 140 pronouns).

Children with hearing impairment produced an *object form* instead of a *subject form* on two occasions, producing *dat* (that) instead of *daar* (there) and *wie* (who) instead of *wat* (what). The percentage errors of all children with HI is 3.4% (four errors in 117 pronouns).

Children with Down's syndrome produced three errors in pronoun class, e.g. *deze* (this) instead of *hij* (he), one time *myself* instead of *self* and one time *mijnes+Noun* instead of *mijn+Noun* (the /s/ should not have been produced) The percentage errors of all children with Down's syndrome was 4.2% (three errors in 118 pronouns).

Research question 4: Correlations between age, MLU, and number of pronouns

With respect to the relationship between age and total number of pronouns, a significant positive correlation was found only in the case of the typically-developing children (Spearman's $\rho = .871$, $n = 15$, $p < .000$, two-tailed).

Significant positive correlations between MLU and total number of pronouns were found for all four groups (TD, SLI, HI, and DS) (see Table X). All coefficients are greater than .5, indicating a considerably strong correlation (Cohen, 1988).

Table X. Correlations between MLU and total number of pronouns.

Group	Number of subjects	Spearman's rho	p-value
TD	15	.803	<.000, two tailed
SLI	18	.539	<.021, two tailed
HI	20	.560	<.010, two tailed
DS	14	.715	<.004, two tailed

Discussion

When the three groups of children with Developmental Language Disorders were matched on MLU_m in three different MLU sub-groups and compared to typically-developing children as well as to each other, there were no differences in the number of pronouns produced (with the exception of demonstratives in the group of children with Down's syndrome). Personal pronouns (subject form) are the most frequently produced pronominal form, followed by the demonstrative pronouns, interrogative and personal pronouns (object form), and possessive pronouns.

Bol and Kuiken (1990) had found a difference between children with SLI and typically-developing children matched on MLU_m in the number of personal pronouns (subject and object form) and possessive pronouns produced. The present research did not show such a difference, which may be explained by a different MLU group classification of the subjects. The same explanation holds for the children with hearing impairment and Down's syndrome. The results corroborate the research by Schelletter (1990) for English children with SLI. Due to the MLU_m match, the Dutch children with Developmental Language Disorders are older than the typically-developing children. Cole et al. (1994) stated that the use of first and second person pronouns in children with hearing impairment was slightly delayed in terms of chronological age. In the present research, especially in the case of the children with Down's syndrome, the age difference was considerable. The only significant difference between the groups when MLU_m was taken into account was that children with Down's syndrome produced fewer demonstrative pronouns.

The order of production of most pronouns in the four groups of children showed a similar developmental trend across all groups, particularly in the case of the production of demonstratives and the subject forms of personal pronouns. The subject forms of the personal pronouns were used most frequently, though these forms were not the first to reach the production criterion. The fact that all groups with the lowest MLU (<3) showed a similar pattern in producing first, second, and third person (male) singular forms might be explained by a very early acquisition of these pronouns. Interrogatives, possessives, and object forms of personal pronouns, on the other hand, were produced less frequently than demonstratives and subject forms of personal pronouns, and showed a less clear pattern of production. One can conclude that, in the order of production of pronouns in the four groups, there were more commonalities than differences to be found. Leonard (2000) stated that children with SLI are delayed in their development of certain pronominal forms. That implies that they tend to follow a more protracted path in the production of pronouns. The same holds for the results by Cole et al. (1994) for children with hearing impairment. Perovic (2002), looking at the comprehension of pronouns, concluded that the language development in children with Down's syndrome was severely delayed, but not deviant compared to typically-developing children. In line with these findings, the developmental path shown by the children with Developmental Language Disorders in the present study was more characterized by a delay than by a deviancy.

The number of errors produced by children in all four groups was generally low, although the children with SLI made more errors in the production of pronouns than the other two groups of children with Developmental Language Disorders. The use of incorrect case marking in personal pronouns (object form instead of subject form) was also reported by Loeb and Leonard (1991) and by Leonard (2000). Farrant et al. (2006) stated that the delays and systematic errors made by children with SLI in the production of pronouns may reflect their limited perspective-taking skills as well as more linguistic difficulties associated with the complexity of some forms. This finding was observed to a lesser extent in the other two groups of children with Developmental Language Disorders. The reported errors concern commission errors. Omission errors are harder to determine, because it is difficult to establish an obligatory context for pronouns. Children can use a full NP instead of a pronoun or leave out a pronoun when the context allows the child to do so, e.g. the first person of the personal pronoun might be omitted in Dutch, if the resulting ellipsis is pragmatically correct. It seems reasonable to conclude that there is no large qualitative (nor quantitative) difference to be found in the errors that children with Developmental Language Disorders make in the production of pronouns, if they were compared to typically-developing children with the same morphosyntactic level, as indicated by MLUm, although the children with SLI make more case marking errors.

The increase in the number of pronouns produced showed a significant positive correlation with the increase of MLU in all groups, indicating that if the increase of language level is taken into account, the increase of production of pronouns exists in all groups. Age is significantly related to the production of pronouns in typically-developing children only, as the correlation between pronouns produced and age is not significant in the groups with a developmental language disorder.

With regard to the two hypotheses discussed in the introduction, the *speech-role hypothesis* and the *name hypothesis*, the present research lends support to the former. The order of production of the personal pronouns (1p, 2p, and 3p singular) in the three Dutch groups of children with Developmental Language Disorders was the same, as well as in the typically-developing children (see Table V). A remarkable difference between Dutch and English is that the 3p singular only concerned the male form *hij* (he). *Het* (it) became productive only in the highest MLU stage (MLU > 4) in the children with SLI, a finding which contrasts with results by Chiat (1978; 1986).

It appears from the present research on pronoun acquisition that children with Developmental Language Disorders of different aetiologies show more commonalities than differences in several aspects of the production of the pronominal system. These results are contrary to those of authors who state that, if the analysis is detailed enough, differences in the language of different groups of children with Developmental Language Disorders will be found (e.g. Clahsen and Almazan, 2001). The results of the present study show that, regardless of the cause of the language problem (or the absence of a clear cause), children with Developmental Language Disorders will have difficulties in the production of pronouns (see e.g. Laws and Bishop, 2004), but do not develop a deviant pronominal system in their productive language.

The data used in the present research are production data collected in an unstructured setting. The main consequence of this way of data collection is that the picture that is provided by the children doesn't tell anything about the comprehension of pronouns and the full mastery of the pronominal system. The used production criterion, though common in the field, is somewhat arbitrary. In future research a different frequency, of for instance at least three or at least five pronouns out of 100 analysable spontaneous utterances in order

to determine a minimum cut-off to measure the productivity of the pronouns, might yield a different picture.

Future research should also take into account that the problems that the children with SLI show in the case marking of the personal pronouns might be related to whether or not the children inflect the verb in their utterance, a relationship addressed for English by Wexler, Schuetze, and Rice (1998) and by Leonard (2000) among others. For Dutch, the methodology used by Wexler, Schaeffer, and Bol (2004) might be an appropriate paradigm.

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