

## **The Acquisition of Grammatical Gender of Determiners in Danish Monolingual and Bilingual Children: An Experimental Study**

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This paper examines the acquisition of grammatical gender of indefinite and definite DPs in Danish. It investigates which grammatical contexts further acquisition and which slow it down, and whether distinguishing between monolinguals and bilinguals makes a difference. Danish has a two-way gender distinction (common and neuter), fusing gender with definiteness in the DP. In order to answer our research questions, we tested monolingual and bilingual Danish-speaking children ( $n=72$ ) from different age groups using the Peabody Picture Vocabulary Test, a Picture Description Task, and a Story Task. A generalized linear mixed effects regression analysis of the results showed that i) the children produced the Standard Danish determiner significantly more often with common than with neuter nouns; ii) the children produced significantly more Standard Danish gender marking in simple DPs than in complex DPs; iii) the children produced significantly more expressions with definite determiners realized as suffixes than with indefinite determiners expressed as pronominal articles in accordance with conventional norms; and iv) bilingual children produced significantly less Standard Danish gender marking than their monolingual peers, but ceiling effects in the monolingual group made it impossible to examine interactions between group and grammatical context.\*

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## 1. Introduction.

Danish has a two-way gender distinction between common and neuter, fusing gender with definiteness in the Determiner Phrase (henceforth: the DP). The aim of this paper is to examine the acquisition of Danish grammatical gender of the indefinite and definite determiner in two grammatical contexts: simple and complex DPs. The paper addresses the following questions: i) Which grammatical contexts further acquisition and which slow it down? ii) Does the distinction between a group of monolingual and a group of bilingual children make a difference when vocabulary is controlled for? and iii) Does frequency play a role in the possible explanation of the results?

We studied 24 monolingual and 48 bilingual children in the age range between 3;11 and 13;11 by means of two elicited production tasks. We used a Picture Description Task and a Story Task as developed by Unsworth et al. (2014) for examining the acquisition of grammatical gender in Dutch. Dutch is similar to Danish in that it distinguishes between common and neuter in the DP, and so the two tasks were adapted and translated into Danish. To our knowledge, this paper is the first experimental acquisition study examining grammatical gender of the determiner in Danish.

The paper is organized as follows. In section 2, we describe the Danish gender system and outline our predictions. Section 3 details the acquisition of the gender of the determiner in the Scandinavian languages. It also presents the results of previous studies that used exactly the same experimental method with groups of speakers with Dutch as their L1 or L2. Section 4 describes the method, focusing on the participants, materials, and procedures; finally, the coding practices are presented. In section 5, the results are reported, while section 6 contains

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Herget Christensen. The tasks used in this paper were designed in the *Early Child Bilingualism* project, which was supported by the Netherlands Organization for Scientific Research with an international program award to Leonie Cornips and with a VENI Innovational Research Incentives Scheme award to Sharon Unsworth. We wish to thank the three anonymous reviewers of JGL, who have significantly contributed to improving the original version.

the discussion and some reflections on issues raised by this study. Section 7 is a brief conclusion.

2. The Danish Gender System.

Danish, like so many other Germanic languages, has fused the gender distinction in the simple DP with definiteness (see tables 1 and 2 below): In Standard Danish, gender in the simple DP is expressed by determiners.<sup>1</sup> All gender marking is neutralized in the plural. Table 1 outlines gender marking in the singular, table 2—in the plural. In the rest of the paper, we concentrate on the singular.

Gender of noun	Indefinite singular		Definite singular	
	Simple DP	Complex DP	Simple DP	Complex DP
Common	<i>en bil</i> 'a car'	<i>en stor bil</i> 'a large car'	<i>bilen</i> 'the car'	<i>den store bil</i> 'the large car'
Neuter	<i>et hus</i> 'a house'	<i>et stort hus</i> 'a large house'	<i>huset</i> 'the house'	<i>det store hus</i> 'the large house'

Table 1. The gender and definiteness system of Standard Danish in the singular.

Gender of noun	Indefinite plural		Definite plural	
	Simple DP	Complex DP	Simple DP	Complex DP
Common	<i>biler</i> 'cars'	<i>store biler</i> 'large cars'	<i>bilerne</i> 'the cars'	<i>de store biler</i> 'the large cars'
Neuter	<i>huse</i> 'houses'	<i>store huse</i> 'large houses'	<i>huse</i> 'the houses'	<i>de store huse</i> 'the big house'

Table 2. The gender and definiteness system of Standard Danish in the plural.

<sup>1</sup> In the following, *Danish* refers to Standard Danish. Among the traditional dialects of Danish, all of them now extinct, some had a three-way distinction between masculine, feminine, and neuter. There was also one dialect that did not have the traditional gender distinction at all but had so-called “matter gender” (see Arboe 2009 for references to the literature and Pedersen 1999 on the fusion of masculine and feminine in Copenhagen Danish).

We examine the acquisition of the gender of the determiner, common versus neuter, in simple and complex DPs. The complex DP contains a determiner and an adjective. In the indefinite complex DP, gender is expressed not only by the common determiner *en* or neuter determiner *et*, but also in the adjective endings (common *-Ø* contrasts with neuter *-t*), as illustrated in table 1. This is in fact why gender is a separate category in the analysis of the DP.<sup>2</sup> In the definite complex DP, however, gender is neutralized in the adjective (both genders have the *-e* form), and thus is only expressed by the definite determiner (see table 1). This means that structurally, the indefinite complex DP has a special status in the system, as it contains more information on gender than its definite counterpart. In the simple DP, there is another distinction between the definite and the indefinite DP. Definite DPs contain a postposed determiner integrated into the phonological word, whereas indefinite DPs contain a preposed free form (see table 1). This system should make the definite form easier to learn than the indefinite.

The two genders, common and neuter, are unevenly distributed in the input. According to the original counts in Hansen 1967 based on samples from the largest Danish dictionary, around 75% of the nouns were classified as having common gender, only very few were variable, and around 25% were classified as neuter. The distribution of roughly 75% versus 25% is also the one given in the most recent reference grammar of Danish (Hansen & Heltoft 2011:453). Unfortunately, we have no figures of the actual input for our participants. However, in the spontaneous speech of Danish mono- and bilingual 14 to 16 year olds, the figures were roughly the same as in the dictionary (Cornips & Gregersen 2017, based on Kappelgaard & Hjorth 2017), which lends credence to the assumption that there is a significant asymmetry as to frequency between common and neuter in the input that our participants were exposed to.

In the present study, all counts were based on the children's production of determiners in different tasks. We distinguished between common and neuter determiners, but we also had to count these

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<sup>2</sup> As in some other Germanic languages, gender is also expressed in Danish in systems other than the DP: Adjectives in predicative position agree with the subject in gender, and all pronouns, including anaphoric and adjectival pronouns, carry gender distinctions. Here we are concerned solely with gender in the DP.

determiners as either agreeing with the nouns or not. Such counts presuppose a norm. We used the standard assignment of nouns to the two genders as documented in various dictionaries (for example, Hjorth & Kristensen 2003–2005) as our norm, but we are acutely aware of the implications. Thus, we have chosen to use the terms *conventional* and *unconventional* throughout (see also note 7 below).

Based on the studies we review below, we predict for Danish:

- (i) that all children will perform better with common than with neuter nouns, given that common nouns are much more frequent than neuter nouns in Danish and that the frequency of nouns in the input will lead to more conventional gender marking as well (see Blom et al. 2008 and Unsworth 2013 on common in Dutch acquisition, and Egger et al. 2018 on neuter in Greek);
- (ii) that there will be less variation in the simple DPs than in the complex DPs (see Bohnacker 1997, Unsworth et al. 2014);
- (iii) that definiteness will play a different role in simple versus complex DPs: Children will produce more conventional marking in definite than in indefinite simple DPs (see also Unsworth et al. 2014) because the definite-cum-gender marker is postposed and fused with the noun root into a phonological word, while the indefinite marker is a preposed free form. We further predict that the participants will produce more conventional marking in the indefinite than in the definite complex DPs. This prediction is based on the systematic difference in the amount of information on gender provided in the indefinite versus definite complex DPs: The indefinite DP has two loci where gender is expressed, whereas the definite DP only has one (see table 1 above and Cornips & Gregersen 2017);
- (iv) that the group of bilinguals will be different from the group of monolinguals (Unsworth et al. 2014).

In the next section, we review two strands of research on grammatical gender. We discuss the acquisition of the gender of the determiner in the Scandinavian languages and present the results of previous studies that analyzed the use of determiners by L1 and L2 Dutch speakers using the experimental method adopted in this study.

### 3. Literature Review: Two Strands of Research.

In this section, we first consider investigations of child acquisition of the Scandinavian languages, in particular the acquisition of determiners. This line of research underpins our predictions presented in section 2 above about which specific features of the structure of the Danish DP will further or slow down the acquisition of gender. Second, we present research that used exactly the same elicited-production experiments with monolingual and bilingual children as the present study, albeit for another language that has a two-way gender distinction of common versus neuter, that is, Dutch. In addition to being the basis for our choice of method, this line of research is also the basis for our predictions about the influence of target language traits on monolingual and bilingual acquisition.

#### 3.1. Studies of the Acquisition and Use of Scandinavian Gender Systems.

Plunkett & Strömquist (1990:24) report on the early (before two years of age) and as they put it “error-free” acquisition of gender in Danish, based on a close analysis of longitudinal data from two monolingual Danish children from the age of 1 till 7 (*ibid.* 23, table 2.1). Since then, a number of studies have examined the acquisition of Norwegian and Swedish nominal gender. We are not aware of any more recent studies of the acquisition of Danish gender in the DP. In the following, we highlight those findings that are relevant for the present paper.

There is an important structural difference between Danish and the two other Scandinavian languages: Standard Norwegian and Swedish both have so-called double definiteness in the complex DP, that is, definiteness is expressed both in a preposed free form (the definite article) and in a postposed bound suffix. Furthermore, unlike Swedish and Danish, most Norwegian lects have a three-way gender distinction. This leads to significant differences in this respect between Norwegian on the one hand and Swedish and Danish on the other. Importantly, double definiteness and a three-way gender distinction give more structural cues for the acquisition of gender (while also requiring more structure to be mastered).

Bohnacker’s (1997) DP acquisition study uses a Swedish corpus of 10 recordings of one child, Embla, from age 1;8 to 2;1 (originally data were collected by Ragnhild Söderbergh). Bohnacker (2003:248) concludes that Embla and other children start encoding number, gender,

and (in)definiteness in language-specific ways long before age 2. Furthermore, Bohnacker (1997), and later Kupisch et al. (2009), point to the fact that bare nouns (whether ungrammatical or not) are rather frequent in Embla's production (see Bohnacker 1997:66, table 1). We come back to this in section 4.3 (in particular, table 6).

Rodina & Westergaard (2013) examine the acquisition of gender of the determiner in Norwegian, which, as mentioned above, in most lects has a three-way distinction between feminine, masculine, and neuter. Their results indicate an important distinction between different structural contexts in which children acquire determiner gender. As for the definite determiner suffix, the four children they focus on rarely make the mistake of using the masculine suffix with conventional neuter and feminine nouns (only 2% of the cases). In contrast, for the indefinite preposed free morpheme, the same children reveal a considerable delay. In particular, the masculine indefinite article is frequently used with conventionally feminine nouns (63%) and even more with conventionally neuter nouns (71%).

We also see the importance of structural context in Cornips & Gregersen 2017. The authors examined the use of gender in the Danish DP using naturalistic data from Kappelgaard & Hjorth's (2017) study of 52 monolingual and bilingual 14–16 year olds in interviews and group conversations. Cornips & Gregersen (2017) show that the characteristic distinguishing the bilingual teenagers from their monolingual age-mates is the use of the definite complex DP. This particular structure shows what one might refer to as bidirectional variation, that is, conventional common is treated as neuter (in 9% of the instances) and conventional neuter is treated as common (in 11% of the instances). The bilingual group performed at ceiling for the simple definite DP but showed some use of unconventional common for conventionally neuter nouns in the indefinite DP (16%; Cornips & Gregersen 2017:115). The Kappelgaard & Hjorth 2017 study is, to our knowledge, the only one on the acquisition of gender of the Danish DP as spoken in Denmark using naturalistic data. For a comparable study of gender in Danish Heritage Language as spoken in Argentina, see Kühl & Petersen 2021.

### 3.2. Results of Similar Picture Description and Story Tasks.

The studies below have been selected because they use exactly the same experimental methods as reported in this paper (sections 4 and 5).

Unsworth (2013) examined the data from 136 simultaneous bilingual English–Dutch children aged between 3 and 17 at the time of testing. By means of a detailed parental questionnaire she established the children’s amount of exposure at the time of testing as well as the amount of their exposure over time and analyzed the effects of this exposure on the acquisition of grammatical gender in Dutch (Unsworth 2013:86). For practical reasons, it was deemed impossible to adopt the parental questionnaire approach in the present study.

English has no gender marking on determiners, and the Dutch two-way gender distinction between common and neuter nouns is only found in the singular definite context for determiners and in the singular indefinite context for adjectives. The results of the Picture Description Task and the Story Task revealed that, averaging across groups (monolingual versus bilingual, all ages), children were significantly more prone to adhere to conventional Dutch norms with common than with neuter nouns; all children’s scores on neuter nouns improved with increasing age, but the bilingual children’s responses were still significantly less conventional than those of the monolingual children (Unsworth 2013:95).

Blom et al. (2008:313–314) showed by means of similar elicitation tasks that monolingual Dutch-speaking children aged 7 may still produce the common definite determiner *de* (instead of *het*) with nouns that are classified in Standard Dutch as neuter in 24% of the cases. The proficiency of bilingual child and adult speakers of Dutch was measured by using a sentence–repetition task, which is part of the diagnostic tool kit *Taaltoets Alle Kinderen (TAK)*; Child Language Assessment; Verhoeven & Vermeer 2001). This particular task is a standardized procedure for measuring proficiency in Dutch in Dutch–Turkish and Dutch–Moroccan Arabic children aged 4–11 years. The result was that the bilinguals showed roughly the same kind of use of common *de* with conventional neuter nouns as the monolingual children.

Unsworth et al. (2014) used exactly the same elicited gender production task in two settings. One involved 30 children between 4;0 and 6;0 years of age with Dutch as their L1 and 122 bilingual English–Dutch speaking children between 3;4 and 17;0 years of age. The other setting involved 21 children with Greek as their L1 between 4;0 and 9;3 years of age and 57 bilingual English–Greek speaking children between 4;2 and 16;5 years of age. Dutch and Greek are quite different in



frequency and transparency of gender cues. In Greek, gender marking of three genders appears on definite and indefinite determiners, as well as adjectives (Unsworth et al. 2014:773). In addition, almost all noun endings have a strong predictive value for masculine, feminine, and neuter assignment since they are suffixed by a portmanteau morpheme integrating gender, number, and case (Unsworth et al. 2014:773). As far as their use of Dutch is concerned, the children were significantly more accurate with common than with neuter nouns (Unsworth et al. 2014:779). For both Dutch and Greek, the children produced significantly more conventional responses for neuter in Dutch and masculine and feminine in Greek in simple DPs than in complex DPs (Unsworth et al. 2014:797). Unsworth et al. (2014:797) accounted for these findings by suggesting a processing effect:

[W]hen the distance between the determiner and the noun is increased by the addition of an intervening element, agreement between determiner and noun appears to break down for some children, making them more likely to fall back on the learner default *de* (common) for Dutch and *to* (neuter) for Greek.

Egger et al. (2018) also investigated gender differences between Dutch and Greek. Their methods are based on those of Unsworth et al. (2014), as described above. This study is of particular interest for two reasons. First, the frequency of gender: In Greek, neuter is quantitatively much more frequent than either feminine or masculine, whereas in Dutch (as well as Danish), common is the more frequent gender. Second, Egger et al. (2018) made several additions to the design: They included a grammaticality judgment task and a measuring procedure for language use at home (as reported by parents). Language use at home was contrasted with vocabulary size as measured by two different tests, one for Greek and one for Dutch. Vocabulary turned out to be the best predictor of standardlike performance for Greek, whereas language use at home was the best predictor for standardlike use of gender in Dutch.

The authors also compared their findings for Greek-Dutch bilinguals with respect to their performance in using Dutch gender with those for English-Dutch bilinguals and monolingual Dutch children in an earlier study by Unsworth (2013). They argued that under the influence of Greek, the awareness of Dutch as a grammatical gender language is raised earlier in Greek-Dutch language acquirers than in English-Dutch

speaking children. Moreover, the Greek-Dutch speaking children aged between 5 and 6 performed better on adjective inflection in Dutch in the neuter context than the L1 Dutch children (Egger et al. 2018:708). The bilingual children performed at ceiling for neuter in Greek. Children with relatively lower vocabulary scores in Greek showed low accuracy in their production of gender features with feminine and especially masculine nouns, while they showed an overuse of neuter in masculine or feminine contexts, which to us testifies to the influence of language-specific properties, such as which gender is the quantitatively dominant one (Egger et al. 2018:703; see also p. 696). Overuse was consistently found for the most frequent gender, whether this happens to be neuter (as with Greek) or common (as with Danish and Dutch).

#### 4. Method.

##### 4.1. Participants.

We tested 72 school children and kindergarteners: 24 monolingual Danish-speaking participants (age range 3;11–13;11) and 48 bilinguals (age range 6;10–13;11) who spoke Danish as their L2.<sup>3</sup> Participants were selected from different age groups. We contacted children in 2nd, 4th, and 5th grades, focusing on children speaking Danish as their L2. We included several children with Arabic ( $n=17$ ), Turkish ( $n=10$ ), Urdu ( $n=9$ ), and Somali ( $n=9$ ) as their L1 and three children speaking Kurdish ( $n=1$ ), Azari ( $n=1$ ), and Nepali ( $n=1$ ) as their first language.<sup>4</sup>

Since children's vocabulary size has previously been found to play a role in the acquisition of gender marking (see section 3), we aimed to ensure that we had comparable ranges of vocabulary scores in the monolingual and bilingual groups; for that reason, we included 8 monolingual kindergarteners with Danish as their L1. Table 3 gives an overview of the distribution of children with different language backgrounds and the four different age groups.

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<sup>3</sup> The terms *monolingual* and *bilingual* are far from straightforward and may represent extremes of a multidimensional spectrum in knowledge and usage (see Wei 2000, Cornips 2014).

<sup>4</sup> As cited by Cornips & Gregersen (2017), Kappelgaard & Hjorth (2017) found that the informants' first language did not make a difference in their use of determiner gender.

Age range	3;11–5;2	6;10–8;11	9;0–10;11	11;0–13;11	Total
Monolinguals	8	8	2	6	24
Bilinguals		13	10	25	48

Table 3. Overview of participants;  $n=72$ .

The participants are distributed as to L1 and age groups as follows: Arabic-speaking: 5 in 6;10–8;11, 5 in 9;0–10;11, and 7 in 11;0–13;11; Turkish-speaking: 1 in 6;10–8;11, 2 in 9;0–10;11, and 7 in 11;0–13;11; Urdu-speaking: 2 in 6;10–8;11, 2 in 9;0–10;11, and 5 in 11;0–13;11; Somali-speaking: 2 in 6;10–8;11, 1 in 9;0–10;11, and 6 in 11;0–13;11; Kurdish-, Azari-, and Nepali-speaking: 3 in 6;10–8;11.

We recruited schoolchildren from one school and one after-school center in Copenhagen, both located in areas with a high percentage of bilinguals. The kindergarteners were recruited from a kindergarten in a different area. All children were tested individually in their kindergarten, school, or after-school center in a secluded room (40% of the participants were tested by the third author, the rest by the three assistants thanked in the acknowledgments note).

#### 4.2. Materials and Procedure.

All children were tested using the Peabody Picture Vocabulary Test (PPVT), which measures receptive vocabulary knowledge in monolingual children up to 14 years of age (Dunn & Dunn 1959). For lack of a standardized version of the PPVT in Danish, we used Nielsen's (2008) adaption, the only Danish version to present progressive difficulty. Figure 1 shows the raw vocabulary scores for the monolingual and bilingual participants at different ages (measured in months). As expected, the bilingual group knew fewer words than the monolinguals at all ages, validating the inclusion of younger monolinguals in order to have more comparable vocabulary ranges and making it important to control the potential effect of receptive vocabulary in the statistical model. This is especially important because receptive vocabulary emerged as a significant predictor of gender-marking accuracy in previous studies (for example, Unsworth et al. 2014, Egger et al. 2018; see section 3 above). Figure 1 shows data from monolingual and bilingual children from 47 months (3;11) to 167 months (13;11). Shaded areas show confidence intervals.

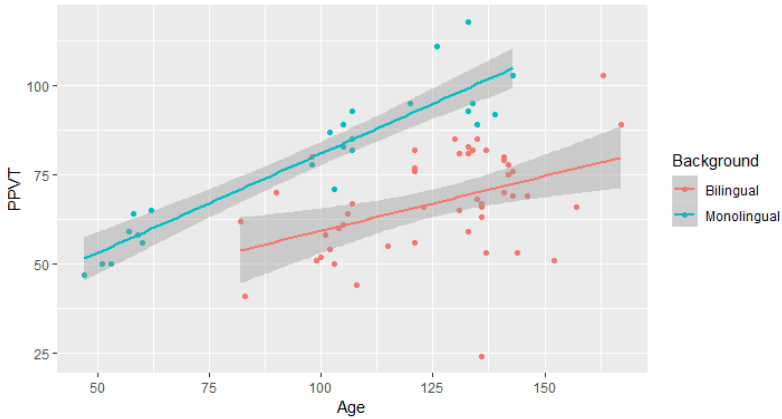


Figure 1. Receptive vocabulary as a function of age in monolinguals ( $r=0.92$ ,  $p<.001$ ) and bilinguals ( $r=0.43$ ,  $p<.005$ ).

Variation in grammatical gender marking on Danish determiners was tested using two elicited production tasks, namely, the Picture Description Task and the Story Task, following Blom et al. (2008), Unsworth & Hulk (2010), and Unsworth et al. (2014). For both tasks, a detailed protocol for testing developed for Dutch by Unsworth (2012) was followed closely. To control effects of presentation order, half of the participants in each task received the items in reversed order.

In the Picture Description Task (adapted from Unsworth & Hulk 2010), participants were presented with 18 pairs of pictures of noun referents on a computer screen—for example, a white and a grey rabbit—and prompted to label them (*Her er... Og her er...* ‘Here is... And here is...’), thereby eliciting an indefinite complex DP twice. Subsequently, the participants were prompted to describe the position of another object relative to the object of interest (for example, Experimenter: “The ball is in front of...” Participant: “...the white rabbit”), thereby eliciting a definite complex DP twice.

When translating the Picture Description Task into Danish, the third author adapted the original Dutch materials in the following ways:

- (i) A number of Danish counterparts of the Dutch test words do not have the same gender as in Dutch, so to keep the same balance between common and neuter nouns in the Danish version—that is,

nine of each—these test words (and their accompanying picture stimuli) were replaced.<sup>5</sup> Nouns that begin with *t* in their Danish translation (such as *træ* ‘tree’) were also replaced, as it would have been impossible to discern the final *t* in the indefinite neuter determiner *et* ‘a’ before *t*-initial nouns.

- (ii) The most frequent property contrast in the Dutch version used to elicit complex DPs with contrasting adjectives was size, contrasting *klein* ‘small’ and *groot* ‘big’ in 12 out of 18 items. Unfortunately, the Danish counterpart of *klein* ‘small’, *lille*, is one of the rare Danish adjectives that do not take gender marking. For two thirds of the items, it was therefore necessary to substitute the size contrast with one of the following property contrasts: empty–full, tall–short, fat–thin, or a color contrast. In some cases, this substitution also required changing the target noun because the new property contrast could not be applied to the original referent.
- (iii) Whereas the indefinite determiner in Dutch is gender-neutral and was therefore used in the prompt *Dit is een... En dat is een...* ‘This is a... And that is a...’, the indefinite determiner in Danish agrees with its head noun in gender. The prompt was therefore reduced to *Her er... Og her er...* ‘Here is... And here is...’, and the children’s choice of the indefinite determiner was scored alongside their choices of definite determiners and suffixes.

The noun pairs presented were evenly distributed between common and neuter. Each of the two gender choices presented both animate ( $n=3$ ) and inanimate ( $n=6$ ) nouns, but we also took care to present an equal number of nouns of high ( $n=3$ ), intermediate ( $n=3$ ), and low ( $n=3$ ) frequency for each gender. Assignment to these three frequency levels was based on frequency measures from caregiver speech in the Danish parent–child corpus, *Odense Twin Corpus* (Basbøll et al. 2002). By checking the proportion of children producing the nouns at different ages in the Danish section of the *Wordbank* database, we also made certain that the nouns could be expected to be familiar to the participants.

In the Story Task, the experimenter explained that she would tell the

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<sup>5</sup> Note that the distribution of gendered nouns in the experiment does not match that in real life, according to the frequency differences given above in section 2.

participant three short stories, and that the participant was to help with this task. The participant is expected to complete a sentence presented by the experimenter by producing the missing DP when the experimenter pauses while a PowerPoint shows the relevant pictures (see Unsworth 2008, Unsworth & Hulk 2010). In 1 below, the words to be supplied by the child are indicated by brackets. The test phase is preceded by a short training phase in which participants practice the oral gap-filling format with four items (two nouns of each gender).

- (1) Niklas og Marie er søskende. En dag beslutter de sig for at tage på tur. De vil besøge en bondegård. På bondegården ser de [et får] og [en kanin], og i et træ sidder der [et eger]. Dyrene er sultne, og Niklas og Marie giver dem noget at spise. Hvilket af de tre dyr får en småkage? [egernet] Hvilket af de tre dyr får en gulerod? [fåret] Hvilket af dyrene får et stykke brød? [kaninen].

‘Nick and Mary are siblings. One day, they decide to go on a trip. They want to visit an animal farm. On the animal farm, they see [a sheep] and [a rabbit], and in a tree, there’s [a squirrel]. The animals are hungry, and Nick and Mary give them something to eat. Which of the three animals gets a cookie? [the squirrel] Which of the three animals gets a carrot? [the sheep] Which of the animals gets a piece of bread? [the rabbit].’

As the text in 1 shows, participants were expected to produce both indefinite and definite DPs. The Story Task used the same nouns as the Picture Description Task.

#### 4.3. Scoring and Coding.

The children’s responses were audio-recorded and registered on an answer sheet during the experiment. After the experiment, responses from the Picture Description Task as well as the Story Task were entered into a single Excel file, based on the sound files and the answer sheets. Responses were coded by following a three-step procedure aiming at ensuring that measures of target gender choice were calculated only on interpretable and gender-marked responses and that it would be possible to compare degrees of successful gender marking in the different grammatical contexts. Table 4 summarizes this three-step procedure;

below, we describe the decisions in detail.

Coding steps	
1. Presence of gender marking	Gender-marked versus uninterpretable
2. Type of grammatical context	DP complexity: Simple versus complex Definiteness: Definite versus indefinite
3. Determiner gender	Conventional versus unconventional

Table 4. Steps in the coding procedure.

As the first coding step, we established the presence of gender marking. We excluded various types of uninterpretable answers from further analysis: Responses with unclear pronunciation (such as not articulating the final consonant in the article, saying *e* instead of *et* or *en*), responses with different nouns from the ones intended (for instance, *bjerg*(N) ‘mountain’ instead of *bakke*(C) ‘hill’), a handful of alternative DP constructions (such as plural *nøglerne* ‘the keys’ instead of singular *nøglen* ‘the key’), and lack of response altogether. There was no significant difference between the proportions of uninterpretable answers in the two groups of children (monolinguals: 3%; bilinguals: 3%). Table 5 specifies the number of excluded uninterpretable answers in each group.

	MONO- LINGUAL	BILINGUAL	MONO- LINGUAL	BILINGUAL
	Alternative noun		Unclear pronunciation	
Common	29/1248 (2%)	44/2444 (2%)	6/1248 (0%)	18/2444 (1%)
Neuter	7/1248 (1%)	67/2444 (3%)	6/1248 (0%)	6/2444 (0%)
	Alternative DP construction		Lack of response	
Common	1/1248 (0%)	4/2444 (0%)	15/1248 (1%)	19/2444 (1%)
Neuter	0/1248 (0%)	1/2444 (0%)	12/1248 (1%)	7/2444 (0%)

Table 5. Proportion of different types of uninterpretable answers in the two groups of children.

As the analysis examines the children’s choice of common versus neuter marking, we included only gender-marked responses and excluded

responses with bare nouns, such as *bike* ‘bike’, which constituted 11% of the full set of interpretable responses (787 of 7,142). It is worth noting that the bilinguals were significantly more likely to resort to the strategy of using bare nouns than the monolinguals ( $\chi^2=63.319$ ,  $df=1$ ,  $p<.0001$ ; see table 6). There was no difference between the two conditions in the use of bare nouns (common versus neuter), either overall or in the two groups separately. One participant (a girl aged 8;8 years with Somali as her first language) responded with bare nouns on every single trial. Since she did not produce a single determiner during the experiment, there were no data points from this participant to include in the statistical model.

	Monolingual	Bilingual
Common	83/1197 (7%)	296/2359 (13%)
Neuter	84/1223 (7%)	324/2363 (14%)

Table 6. Proportion of bare noun responses in the two groups of children.

As the second coding step, we identified the type of grammatical context. We coded all the remaining responses for DP complexity and definiteness. As described above, the elicitation materials aimed at eliciting six DPs per item per child: four complex DPs (two definite, two indefinite) and two simple DPs (one definite, one indefinite). However, children sometimes responded with a DP type different from the one expected, by, for example, adding or omitting an adjective or producing an indefinite instead of a definite determiner. It was therefore important to categorize all children’s responses according to the actual DP type used and not simply according to the task condition it was produced in. This means that for each child, there may be a different number of responses with each of the four combinations of DP complexity and definiteness (see examples of the combinations in table 7).

Tables 8 and 9 document the proportions of responses in which participants produced or did not produce the DP type we expected. We would like to emphasize that the unexpected responses should not be interpreted as errors. They are in all cases grammatically correct and can be explained as arising from alternative interpretations of the pragmatic situation. For example, while we expect an indefinite determiner the first time the child mentions a referent, use of a definite determiner can still be pragmatically motivated by the experimenter and the child’s joint



focus on the visually available new referent. Furthermore, omitting or adding an adjective depends on the children’s perception of the relevance of including property information in their referring expressions. As can be seen in table 8, participants were slightly more likely to produce a complex DP where a simple one was to be expected (by adding an extra adjective in a noncontrastive context rather than leaving one out), and there was no difference between the groups. The only significant difference between the two groups was that the bilinguals were more likely than the monolinguals to use a definite expression for introducing previously unmentioned, but visually available referents ( $\chi^2=61.483$ ,  $df=1$ ,  $p<.0001$ ).

DP complexity	Determiner definiteness	
	Definite	Indefinite
Simple	noun-suffix <i>lys-et</i> ‘the candle’	article noun <i>et lys</i> ‘a candle’
Complex	article adjective noun <i>det høje lys</i> ‘the tall candle’	article adjective noun <i>et højt lys</i> ‘a tall candle’

Table 7. Examples of grammatical contexts: DP complexity and determiner definiteness.

	MONOLINGUAL		BILINGUAL	
	Produced simple	Produced complex	Produced simple	Produced complex
Expected simple	623/691 (90%)	68/691 (10%)	1117/1236 (90%)	119/1236 (10%)
Expected complex	107/1562 (7%)	1455/1562 (93%)	237/2866 (8%)	2629/2866 (92%)

Table 8. Responses with simple versus complex DPs in contexts aimed at eliciting simple versus complex DPs.

	MONOLINGUAL		BILINGUAL	
	Produced definite	Produced indefinite	Produced definite	Produced indefinite
Expected definite	1036/1162 (89%)	126/1162 (11%)	1852/2095 (88%)	243/2095 (12%)
Expected indefinite	44/1091 (4%)	1047/1091 (96%)	256/2007 (13%)	1751/2007 (87%)

Table 9. Responses with definite versus indefinite determiners in contexts aimed at eliciting definite versus indefinite determiners.

As the third and final step, we identified the determiner gender. We categorized responses as either *conventional* (gender-marking determiner or suffix agrees with the head noun) or *unconventional* (gender-marking determiner or suffix does not agree with the head noun).<sup>6</sup> Data from both tasks were combined in the analysis.

## 5. Results.

### 5.1. Descriptive Overview and Mixed-Effects Regression.

Table 10 gives an initial descriptive overview of the proportions of conventional determiner gender marking in the two different groups (monolinguals versus bilinguals) in different grammatical contexts, namely, with common versus neuter nouns, in complex versus simple DPs, and in definite versus indefinite DPs. The table documents a ceiling effect for the monolingual group, particularly with common nouns, a result which accords well with what is reported above about early and error-free acquisition of gender. However, the table also reveals notable variation in the group of bilinguals. The difference is particularly pronounced in the neuter gender. The results from the bilinguals are shaded in the table contrasting the differences between the monolinguals and bilinguals. Please note that table 10, in contrast to the statistical

<sup>6</sup> We are fully aware of the normative character of this coding procedure, as it ignores the possibility that the child may actually have intended the other gender marking and not the one given as the standard in the dictionaries, and thus, strictly speaking, may not be making an error at all. Hence, we have used *conventional* versus *unconventional* throughout.

model reported in table 11 below, does *not* take differences in vocabulary scores into account.

Proportion of conventional gender marking		Monolinguals		Bilinguals		
Common	Complex DP	Indefinite	378/382	99%	597/642	93%
		Definite	372/376	99%	694/746	93%
	Simple DP	Indefinite	185/185	100%	317/331	96%
		Definite	171/171	100%	336/344	97%
Neuter	Complex DP	Indefinite	359/379	95%	354/608	58%
		Definite	371/386	96%	336/752	45%
	Simple DP	Indefinite	213/227	94%	269/413	65%
		Definite	144/147	98%	221/266	83%

Table 10. Proportion of conventional choice of determiner gender for different groups in different grammatical contexts.

The main aims of the study were to examine whether children struggle more with producing conventional gender marking in specific linguistic contexts, whether bilingual children face greater difficulties than monolingual children, and whether the same factors play a role for monolingual and bilingual children. To evaluate the effects on gender marking of *Conventional Gender* (common versus neuter), *DP Complexity* (simple versus complex), *Definiteness* (definite versus indefinite), and *Group* (monolinguals versus bilinguals), we applied a generalized linear mixed effects regression model in the statistical environment R (version 3.4.1, R Development Core Team 2017), using the lme4 package (Bates et al. 2015).

The model was fitted to the dependent variable *Determiner Gender*, which was treated as a binary variable with the two values *Conventional* and *Unconventional*; the model controlled for random variation between participants and items by including these as random factors. We also tested three speaker-related control variables: *Chronological Age* (in months), *Biological Gender*, and *Vocabulary Size* (as measured by the PPVT), and two test variables: *Presentation Order* (A versus B) and *Frequency of Target Noun*. The model was fitted following the principle of forward selection, with variables added one at a time; we used model

comparisons at each step to test whether the addition of each new variable made the model significantly better than a version without it. Variables that did not make the model significantly better were discarded.<sup>7</sup> We added the variables in the following order, starting with the control variables and ending with our explanatory predictors: *Presentation Order*, *Biological Gender*, *Chronological Age*, *Vocabulary*, *Group*, *Conventional Gender*, *Frequency of Target Noun*, *DP Complexity*, and *Definiteness*. Because of the structural differences between definite and indefinite determiners in simple and complex DPs, the predictions for the influence of *Definiteness* go in opposite directions in simple versus complex DPs (see section 2 above). We therefore tested the interaction between *Definiteness* and *DP Complexity*. To check whether any of our three experimental predictors (*Conventional Gender*, *DP Complexity*, and *Definiteness*) played different roles for the monolingual versus bilingual children, interactions between these factors and *Group* were also tested. Table 11 summarizes the maximal converging model.<sup>8</sup> Of the five control variables only the speaker variable *Vocabulary* and the test variable *Frequency of Target Noun* contributed significantly to improving model fit. Comparing models with ANOVA confirmed that a full model with all control variables included was not significantly better than the reduced final model in table 11 ( $p=.7897$ ). The experimental factors *Conventional Gender*, *DP Complexity*, *Definiteness*, and *Group* all contributed significantly to explaining variation in gender-marking, and as predicted, there was a significant interaction between *Definiteness* and *DP Complexity*, with *Definiteness* exerting a different influence in simple versus complex DPs. We specify the effects of each of these variables below.

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<sup>7</sup> Following the suggestion of a reviewer, we tested whether we would obtain the same result if using the principle of backward selection, starting from the full model and successively discarding the least significant predictor. Fitting the model using the principle of backward selection yielded exactly the same final model.

<sup>8</sup> Adding an interaction between *Group* and *Definiteness* to this model would significantly improve model fit ( $p=.002021$ ), but the model does not converge if the interaction is added. Adding interactions between *Group* and *DP Complexity* or between *Group* and *Conventional Gender* does not improve model fit significantly.

Random effects				
Groups	Name	Variance	Std. Dev.	
Subject	(Intercept)	2.782	1.668	
Lexical item	(Intercept)	0.246	0.496	
Number of observations: 6355, participants: 71, lexical items: 18				
Fixed effects				
	Estimate	Std. Error	z Value	Pr (> z )
(Intercept)	3.8072	0.3404	11.184	<.0001***
Conventional Gender: Neuter	-3.4767	0.2726	-12.752	<.0001***
DP Complexity: Simple	2.4053	0.1936	12.427	<.0001***
Definiteness: Indefinite	0.5509	0.1231	4.475	<.0001***
DP Complexity: Simple × Definiteness: Indefinite	-1.8289	0.2381	-7.681	<.0001***
Group: Monolinguals	3.7404	0.5690	6.574	<.0001***
Vocabulary (scaled)	1.6797	0.2685	6.256	<.0001***
Frequency of Target Noun (scaled)	0.4881	0.1361	3.587	.0003***
Significance codes: '***' .001				

Table 11. Generalized linear mixed-effects model for *Determiner Gender*.<sup>9</sup>

Of the models testing interactions between *Group* and *Conventional Gender*, *Group* and *DP Complexity* and *Group* and *Definiteness*, only the model including the interaction between *Group* and *DP Complexity* converged, and this interaction was not significant ( $p=.44$ ). However, as the models evaluating interactions between *Group* and *Conventional Gender* and between *Group* and *Definiteness* did not converge, our data set turned out not to be suited for examining whether these two linguistic factors played different roles for the monolingual and bilingual children, presumably because of ceiling effects in the monolingual group.

<sup>9</sup> As explained in the coding section, the model only includes data points from 71 of our 72 participants, as one participant did not produce any determiners in her responses.

## 5.2. Specific Effects of the Variables.

When it comes to *Conventional Gender*, in line with previous studies we found a highly significant main effect of codified conventional gender, with children being much less likely to produce conventional gender marking with neuter nouns than with common nouns. The children almost always produced the conventional common determiner with common nouns, whereas they often produced unconventional gender marking with neuter nouns, extending the use of the common determiner to these nouns too (for example, producing *en hus* instead of *et hus* ‘a house’). As specified in the introduction, common is much more frequent than neuter in Danish, so the participants’ generalization of the common gender to neuter contexts may be interpreted as an effect of input frequency. As predicted, we also found a main effect of *DP Complexity*, with children being more likely to produce conventional gender marking in simple DPs than in complex DPs (see below for more information).

With respect to *Definiteness*, on the basis of the results found in the literature reviewed above, we predicted that children would perform more conventionally with indefinite determiners than with definite determiners in complex DPs, and as table 11 shows, this was indeed the case. The model takes complex DPs as its reference level, and for complex DPs we found a positive effect of indefiniteness. As explained in section 2 above, structural aspects of Danish DPs could account for this difference in performance between indefinite and definite determiners in complex DPs. As seen in table 1 above, indefinite DPs provide children with two cues to noun gender, marking gender on both the determiner and the adjective. Indefinite DPs thus provide children with double the amount of gender information compared to definite DPs, where gender is only marked once, on the determiner (see table 1).

We also examined the interaction between *DP Complexity* and *Definiteness*. As explained in section 2 above, we expected definiteness to play opposite roles in simple versus complex DPs, and we therefore tested whether *DP Complexity* interacted with *Definiteness* to determine the number of responses with conventional determiner gender. For simple DPs, we predicted, on the basis of previous results (see section 2), that children would perform more in accordance with conventions with definite determiners expressed as suffixes than with indefinite determiners expressed as prenominal articles. As the interaction between *DP Complexity* and *Definiteness* in table 11 shows, this was indeed the

case. Whereas indefiniteness had a positive effect in complex DPs, it had a negative effect in simple DPs. Table 12 illustrates the different role of definiteness in simple versus complex DPs: Chi-square tests confirm that definite determiners are significantly more likely than indefinite determiners to receive conventional gender marking in simple DPs ( $\chi^2=41.326$ ,  $df=1$ ,  $p<.0001$ ), whereas they are significantly less likely than indefinite determiners to receive conventional gender marking in complex DPs ( $\chi^2=20.531$ ,  $df=1$ ,  $p<.0001$ ).

	Simple DPs		Complex DPs	
	Conventional	Unconventional	Conventional	Unconventional
Def.	872 (94%)	56 (6%)	1774 (78%)	486 (22%)
Indef.	984 (85%)	172 (15%)	1688 (84%)	323 (16%)

Table 12. Gender-marking conventionality for definite versus indefinite determiners in simple versus complex DPs.

The variable *Group* (the bilingual versus monolingual distinction) also had an effect. Following previous studies, we expected bilingual children to produce less conventional gender marking than their monolingual peers. The results bear out this expectation. Even with vocabulary controlled, the bilingual children were significantly less likely to produce conventional gender marking. There was no interaction between *Group* and *DP Complexity*, indicating that for both monolingual and bilingual children complex DPs posed a greater challenge than simple DPs. However, since the models including interactions between *Group* and *Conventional Gender* on the one hand and *Group* and *Definiteness* on the other did not converge, we cannot be certain whether these structural factors play the same or different roles in the two groups.

Further, the control variable *Vocabulary*, that is, children's receptive vocabulary as measured by the PPVT (and usually taken to reflect children's general linguistic level), had a main effect on gender assignment. Choice of determiner gender was found to covary with vocabulary size, with larger vocabularies predicting more standardlike gender-marking performance, suggesting that as children are acquiring more words, they are also refining their attention to gender. Figure 2 illustrates the positive relationship between receptive vocabulary and proportion of responses with conventional gender in both groups. Shaded

areas show confidence intervals. We have not been able to control for input—as, for example, Egger et al. (2018) did—and thus we cannot contrast vocabulary size and total input as was done in the Unsworth et al. 2014 study.

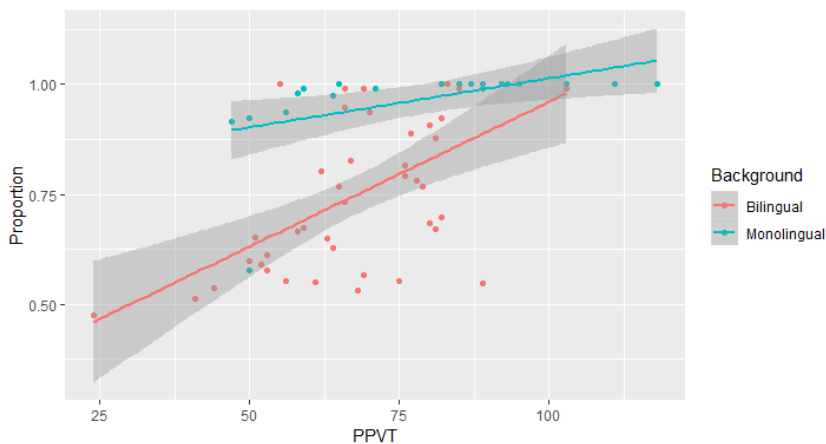


Figure 2. PPVT score distributions for monolinguals and bilinguals in relation to proportion of conventional responses.

It is worth noting that, as figure 2 shows, the effect of vocabulary on the proportion of responses with conventional gender marking is more pronounced for the bilingual group than for the monolingual group, possibly due to the ceiling effect in the monolingual group.

The results above suggest that children varied in their individual lexical development and that this variability is important, as evidenced by the significant effect of *Vocabulary*. In addition, we found that children's performance with respect to individual nouns varied as well. Specifically, children's performance varied depending on how frequently a particular noun could be expected to occur in the child's input, that is, in parental speech as measured in the Odense Twin Corpus (Basbøll et al. 2002). In other words, the variable *Frequency of Target Noun* also had an effect. The expectation was that children would be more familiar with the gender-marking requirements of nouns they encounter often in their input, and the positive effect of target noun frequency confirmed



this expectation. Thus, not only vocabulary size matters, but also frequency of use.

## 6. Discussion, Perspectives, and Reflections.

### 6.1. Discussion of the Results.

In line with previous studies, we found a highly significant main effect of codified conventional gender, with children being much less likely to produce conventional gender marking with neuter than with common nouns. As stated in 5.2 above, this may be due to input frequency.

Furthermore, based on the literature on the acquisition of Swedish and Norwegian and the description in table 6, we are convinced that the first step in the acquisition of Danish involves bare nouns (Bohnacker 1997:66, Kupisch et al. 2009:230). The next step is presumably the acquisition of the definite simple DP (perhaps alternating with bare nouns), as indefinites are rare both in production and child-directed speech in Scandinavian (Bohnacker 1997:71). Note, however, that this is apparently not the case for the two Danish children analyzed in Plunkett & Strömqvist 1990:81ff., as both produced many indefinites. This may be an accidental or a real difference between Swedish and Norwegian acquisition and the acquisition of Danish.

As predicted, we also found a main effect of *DP Complexity*, with children being more likely to produce conventional gender marking in simple DPs than in complex DPs (see below for more details). With respect to *Definiteness*, we predicted that children would perform more conventionally with indefinite determiners than with definite determiners in complex DPs, and this was indeed the case. As explained in section 2 above, two structural aspects of Danish DPs could account for this difference in performance between indefinite and definite determiners: adjective marking and determiner expression. Gender marking is much more transparent in indefinite DPs than in definite DPs since both the adjective and the determiner vary. Furthermore, the indefinite determiner is expressed by the same morph (common *en*; neuter *et*) in the same prenominal position in both simple and complex DPs, facilitating identification. In contrast, the definite determiner is expressed in different positions as well as by different morphs in simple versus complex DPs: the common suffix *-en* and the neuter suffix *-et* in simple DPs versus preposed free forms common *den* and neuter *det* in complex DPs. Spoken Danish, preliterate children's only input, holds even fewer

cues to the relationship: The pronunciation of *det* [d̥e] and *-et* [əð] is not a good cue to identifying both of them as being neuter.

As explained in section 2 above, we expected *Definiteness* to play opposite roles in simple versus complex DPs. Therefore, we asked whether *DP Complexity* interacted with *Definiteness* in order to determine the number of responses with conventional determiner gender. For simple DPs, we predicted that children would perform more in accordance with conventions with definite determiners, expressed as suffixes, than with indefinite determiners, expressed as prenominal articles. As the interaction between *DP Complexity* and *Definiteness* in table 11 shows, this was indeed the case. Whereas indefiniteness had a positive effect in complex DPs, it had a negative effect in simple DPs.

These experimental results from monolingual and bilingual children acquiring Danish match the findings in studies of Norwegian and Swedish acquisition. In these studies, too, the children's production of gender marking expressed as a bound morpheme was conventional earlier than their production of gender marking expressed as a free morpheme (Bohnacker 2007, Rodina & Westergaard 2013). The participants' proficiency in gender marking using the bound definite suffixes as opposed to the free indefinite articles also corresponds with the results from spontaneous speech in Cornips & Gregersen's (2017) study of Danish teenagers. In that study, the monolingual and bilingual 14–16 year olds were all found to use the bound morpheme in accordance with conventions, whereas there was more variation in the use of the free morpheme. As suggested by Cornips & Gregersen (2017), a likely explanation for the conventional use of the bound definite morpheme is that it is more closely integrated with the noun, forming one phonological unit.

As for the bilingual versus monolingual distinction, we expected the bilingual children to produce less conventional gender marking than their monolingual peers. The results bear out this expectation. Even with vocabulary controlled, the bilingual children were significantly less likely to produce conventional gender marking. At the same time, the lack of interaction between the variable *Group* and the other explanatory variables is worth noting. If the bilingual children had been following a radically different path of acquisition of grammatical gender in Danish compared to the monolingual children, these structural factors could have been expected to have a differential impact on gender marking in the two

groups of children, but the relationships uncovered by the model appear to be stable across all speakers. This supports the observation by Cornips & Gregersen (2017) that the gender-marking choices in spontaneous speech of bilingual teenagers differ quantitatively but not qualitatively from the choices of their monolingual peers (in both Danish and Dutch).

The variables *Vocabulary* and *Frequency of Target Noun* also played a role. The choice of determiner gender was found to covary with vocabulary size, with larger vocabularies predicting more conventional gender-marking performance. We also found the children's performance to vary with the different nouns, depending on the variable frequency of these nouns as measured by their occurrence in parental speech in the Odense Twin Corpus (Basbøll et al. 2002). The expectation was that the children would be more familiar with the gender-marking requirements for nouns they encounter often in their input, and the positive effect of target noun frequency confirmed this expectation. Thus, not only vocabulary size matters, but also frequency of use.

## 6.2. The Sociolinguistic Perspective.

The main distinction in our group of participants is between monolinguals and bilinguals. In retrospect, we should have included a much younger group of monolingual children if we wanted to examine whether acquisition of Danish determiner gender proceeds in similar ways across monolingual and bilingual children. Ceiling effects in the monolingual group prevented us from investigating most of the possible interactions we were interested in. Still, our finding that bilingual children struggle with gender marking—even when differences in vocabulary are controlled—is important in a real-life context. Indeed, the schoolteachers we worked with during testing were highly interested in our materials, as their subjective experience was that gender marking is an area in which their bilingual pupils were especially challenged.

However, from a sociolinguistic point of view, the distinction between monolinguals and bilinguals may be too simplistic or even misleading: It is not the case that monolinguals get input only from Danish nor is it the case that bilinguals learn two equally prestigious languages. All the Copenhagen children tested in this study, including the monolinguals, are exposed to quite a few other languages in addition to Danish—not least through their exposure to the mass media. It is common for the monolinguals to have at least a receptive competence in

English as well as Danish, due to the input from American television series (which are not dubbed). As they grow older, they will participate in online practices as well, often using English for gaming, etc.

The bilingual children all come from minority language backgrounds. Their L1 has no prestige whatsoever in the Danish speech community. While it may be possible for adults in Copenhagen to make do with English only, it is simply not possible for any adult to live a life in Copenhagen solely in any of the minority languages. This is because Denmark—in contrast, for example, to the US—does not have any minority language communities large enough to sustain institutions such as schools or healthcare facilities. For the bilingual children in this study, this means that they will all have to learn Danish. Therefore, the huge variation as to vocabulary scores in the group of bilingual children represents a real problem in everyday life.

Finally, it is in the nature of experimental designs that reality is simplified. We did, for instance, include an equal number of common and neuter nouns in our tests, even though common nouns are vastly more frequent in running discourse. The experimental context may have had the effect of overstating the difference between the two groups: If in the experiment a bilingual child, unlike their monolingual age-mate, uses a common form instead of a neuter one in 50% of the cases, in real life this number would be reduced to 12.5%, since the neuter is so infrequent (only 25% of the Danish nouns are neuter). Even so, the use of common instead of conventional neuter may be highly salient.

Thus, we may have both overestimated and underestimated the problem posed by unconventional gender use for real life communication, since in our study of gender agreement we focused on a selected set of nouns. On the one hand, gender assignment is, in fact, mostly arbitrary in Danish and, arguably, not of any consequence. Unconventional use of common determiners with nouns that are conventionally neuter will not lead to confusion in referential communication. Hence, we may have overestimated the communicative significance of gender. On the other hand, it will surely make a social difference if bilinguals use common determiners with nouns that are conventionally neuter: They will be unequivocally identified as speakers associated with an immigrant background (Quist 2008). Thus, we may have underestimated the social consequences.

## 7. Conclusion.

We have studied the production of Danish determiner gender in monolingual children (aged 3;11 to 13;11) and bilingual children (aged 6;11 to 13;11) using the experimental methods developed in Unsworth 2012. In this first experimental study of the acquisition of gender marking in the Danish DP, we have shown that the bilingual group of speakers produces variable gender markings. The monolinguals acquired gender, particularly the suffixed definite form, so early that they perform at ceiling. In contrast, the bilinguals have to learn the relationship between indefinite and proposed gender marking on the one hand and between definite and suffixed gender marking on the other (suffixed forms are easier to acquire than free ones). On top of that, the bilinguals have to learn where gender is marked in the two types of complex DP: In indefinite complex DPs, gender is marked in two places, whereas in definite complex DPs, it is only marked once. Structural factors thus make the indefinite easier to acquire. The less frequent gender in Danish, the neuter, manifests most variability in acquisition. This can be explained by the frequency effect of the two genders in general, as well as by the frequency of the particular words tested.

Finally, the first step in the acquisition of Danish may involve bare nouns, and the next step is presumably the acquisition of definite simple DPs (perhaps alternating with bare nouns). It has been suggested in the literature on the acquisition and attrition of Norwegian that the definite suffix is a declension class marker (for an overview, see Lohndal & Westergaard 2016, 2021). However, if initially bare nouns are used together with definite DPs this makes an interpretation of the definite suffix as a declension class marker quite a bit less likely for the purposes of either acquisition or attrition. Bare noun forms heard along with definite forms will provide the necessary evidence that the definite is precisely a suffix and not part of the word proper. Finally, we have reflected upon the validity of our results and have concluded that they may be more significant sociolinguistically, namely, for classification of speakers as bilinguals, than for referential communication.

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