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RESEARCH

The decline of feminine gender: a cross-dialectal study of seven Norwegian dialects

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Abstract This paper presents a cross-dialectal study of grammatical gender in Norwegian nominal phrases. Specifically, we investigate the decline of the feminine gender in three age groups across seven different dialects. The dialects vary in their morphological richness of gender marking: some dialects traditionally have more distinctive marking of the feminine gender. With an elicited production experiment, we investigate gender marking on the indefinite determiner and the definite suffix. We find that feminine gender is in decline in all dialects, but there are clear differences between the locations and between age groups. The feminine indefinite determiner *ei* is replaced by the masculine *en* at different rates and to a different degree in the various dialects. We furthermore find that the feminine definite suffix *-a* is retained in all locations except for Stavanger. We argue that the decline of the feminine gender can be explained by an interplay between the morphological richness of the given dialect and dialect contact. The former helps to retain the feminine as a separate category, while the latter accelerates the loss of the feminine.

Keywords Grammatical gender · Language change · Norwegian · Dialect variation · Morphological richness

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1 Introduction

In Norwegian, gender distinctions are marked on nominal elements, including determiners, adjectives, and pronouns. Most dialects have traditionally retained the Indo-European three-way distinction between feminine, masculine, and neuter gender, as opposed to several other Germanic languages, such as Swedish, Danish, and Dutch. However, several studies have shown that this is undergoing change, as feminine forms are generally replaced by masculine ones in many dialects (Lødrup 2011; Rodina and Westergaard 2015; Busterud et al. 2019). Until now, this has only been studied in relatively large cities, and it remains unclear whether the loss of feminine gender is an urban phenomenon or a more general tendency across Norwegian dialects. This paper reports a study conducted with participants in three age groups across seven Norwegian cities of different size. The participants did a production task which elicited indefinite determiners and definite suffixes.

The study confirms that feminine gender is vulnerable across Norwegian dialects, and that younger participants generally produce fewer feminine forms than older participants. However, we also find considerable differences between the seven places. This indicates that the change has started at different points in time and is happening at different rates. To uncover the reason for this, we further investigate possible factors that may influence how feminine gender is lost or retained in speakers and language communities. Our main hypothesis is that the loss of feminine gender in Norwegian is the result of an interplay between the richness of the gender morphology in the given variety and sociolinguistic factors, mainly dialect contact. We argue that feminine gender is retained better in dialects with richer gender morphology, because the learners of these dialects are exposed to more feminine gender cues. Put differently, less syncretism makes the category less likely to collapse, making the category easier to acquire. Dialect contact, on the other hand, we claim accelerates the process of gender loss.

The paper is structured as follows. Section 2 introduces the traditional gender system of Norwegian and reports earlier studies of loss of feminine gender in Norwegian dialects. Section 3 presents our research questions and hypotheses. The methodology is discussed in Sect. 4, which includes the selection of places (dialects) and participants, and the procedure of the elicited production task used in the study. Section 5 reports the results from the study. In Sect. 6 the results are discussed in light of the research questions and hypotheses.

2 Background

Norway is a country ripe with dialectal variation (Haugen 1976; Vikør 1995). Essentially, every place has its own dialect, and people mostly use their dialect in all aspects of life, making communication "polylectal" (Røyneland 2009, 7). Despite the robust standing of dialects, there are currently significant ongoing processes of change affecting dialects in Norway (see Røyneland 2009 for an overview). Over the past few generations, there has been less use of some kind of standard spoken

language in the public sphere (these are spoken varieties of the two standard written languages, Bokmål and Nynorsk), what we can refer to as destandardization, whereas new, levelled, urban dialects have emerged (Sandøy et al. 2014). Cities such as Bergen, Oslo, and Stavanger have seen a rise of formerly low-status forms and a corresponding decline of high-status forms (Gabrielsen 1984; Nornes 2011; Aasen 2011; Stjernholm 2013; see also Stausland Johnsen 2015).

The ongoing changes in Norwegian dialects also affect grammatical gender, even though this has not been studied systematically. The traditional assumption has been that the widespread three-gender system has been preserved "in the overwhelming majority of the Scandinavian dialects down to the present" (Haugen 1976, 288). However, Bokmål also allows a two-gender system, and the dialect of Bergen lost the feminine gender centuries ago (Jahr 1998, 2001; Nesse 2002; Trudgill 2013). Table 1 illustrates the ways in which the three-gender system is typically expressed —overtly and covertly (setting aside pronouns).

As shown in the table, there is considerable syncretism between masculine and feminine, e.g., in the adjectives (setting aside exceptional adjectives like 'little', i.e., *liten.*$_M$, *lita.*$_F$, *lite.*$_N$). Norwegian also displays double definiteness, which involves marking definiteness with a suffix on the noun itself and with a prenominal determiner in the same phrase. In this case, there is also syncretism between the masculine and the feminine, with *den* being the common form and *det* being the neuter form. The same applies to demonstratives and certain quantifiers, not illustrated in the table: *denne bilen*$_M$ 'this car', *denne boka*$_F$ 'this book', and *dette huset*$_N$ 'this house' for demonstratives, and *all maten*$_M$ 'all the food', *all suppa*$_F$ 'all the soup', *alt rotet*$_N$ 'all the mess' for quantifiers. Overall, it is fair to say that three-gender dialects have a considerable degree of syncretism between masculine and feminine gender, and since syncretism makes it harder to reliably distinguish between the three genders, it makes it challenging to acquire the system. It has already been established that grammatical gender is acquired late in Norwegian; see Rodina and Westergaard (2013) and Busterud and Lohndal (2022).

Considering the distribution of the three genders, different sources provide different numbers, although all agree that masculine is the most frequent gender (e.g., Trosterud 2001; Rodina and Westergaard 2015). A spoken corpus of the Tromsø

Table 1 The traditional gender system in many varieties of Norwegian (idealized version based on Bokmål)

	Masculine (M)	Feminine (F)	Neuter (N)
Indefinite	en hest *a horse*	ei seng *a bed*	et hus *a house*
Definite	hesten *horse.*DEF	senga *bed.*DEF	huset *house.*DEF
Double definite	den hesten *that horse.*DEF	den senga *that bed.*DEF	det huset *that house.*DEF
Adjective	en fin hest *a nice horse*	ei fin seng *a nice bed*	et fint hus *a nice house*
Possessive	min hest/hesten min *my horse*	mi seng/senga mi *my bed*	mitt hus/huset mitt *my house*

dialect (Anderssen 2006) shows that feminines and neuters have roughly the same distribution: 18.9% and 18.5% respectively (token frequency).

In considering Table 1, a notoriously contested issue revolves around the definite suffix. Traditionally, this exponent differs across the three genders. Traditional Norwegian grammars (e.g., Faarlund et al. 1997) therefore consider the definite suffix to be an exponent of gender; see also Andersson (2000) and Dahl (2000) for a similar conclusion for Swedish. On the other hand, applying the definition given by Hockett (1958), which states that "[g]enders are classes of nouns reflected in the behavior of associated words" (cf. Corbett 1991), this suffix could instead be considered a declension class marker, as in Fretheim (1985), Enger (2004), Lødrup (2011), Rodina and Westergaard (2015), Lohndal and Westergaard (2016, 2021), Svenonius (2017), Busterud et al. (2019), and Lundquist et al. (2022). An in-between position is pursued by Enger (2004, 137), who argues that the suffix to a certain degree encodes gender. This question is important when it comes to considering ongoing changes in the grammatical gender inventory in Norwegian. We will follow what is today the main consensus and assume that gender is primarily marked on free-standing items, but we note, in accordance with Svenonius (2017), that the definite suffix can express gender if gender is already established as a category on free-standing forms (e.g., determiners). Put differently: if there are three indefinite determiners each denoting a gender, the definite suffix can also express gender. However, if there are only two indefinite determiners but three definite suffixes, the latter cannot express gender. Note also that since the definite suffix varies across and within some dialects, we will denote the feminine definite suffix as *-A*.

Recent work has shown a clear tendency where feminine gender is vulnerable and clearly disappearing from multiple dialects and varieties of Norwegian: in Northern varieties in contact with the Finno-Ugric languages Sami and Kven (Conzett et al. 2011), in Oslo (Opsahl and Nistov 2011; Lødrup 2011; Lundquist and Vangsnes 2018; Hårstad and Opsahl 2022), in Tromsø (Rodina and Westergaard 2015, 2021), and in Trondheim (Busterud et al. 2019). In all these cases, there is a clear pattern: The feminine indefinite determiner is lost, whereas the feminine definite suffix remains. Table 2 illustrates the change for determiners.

Rodina and Westergaard (2015) and Busterud et al. (2019) argue that this is related to language acquisition, due to the massive syncretism between masculine and feminine, as seen in Table 1. The cause of the change, though, is argued to be sociolinguistic and to align with the process of 'urban jumping' (e.g., Trudgill 1974, 1983; Taeldeman 2005; Vandekerckhove 2009) where a feature spreads between big cities, and then from a big place to smaller places like circles in water.

Table 2 How a three-gender system is changing into a two-gender system in Norwegian

Three-gender system (determiners)	Two-gender system (determiners)
Masculine	Common (=masculine)
Feminine	
Neuter	Neuter

Table 3 Cues for feminine gender in some Norwegian dialects

Cue	Example
1 M/F distinction in indefinite determiner	ei jente vs. en gutt a.F girl a.M boy
2 M/F distinction in definite suffix	jent-a vs. gutt-en girl-DEF.F boy-DEF.M
3 M/F distinction in plural suffix	jent-e(r) vs. gutt-a(r) girl-PL.F boy-PL.M
4 Weak indefinite FEM nouns ending in *-a*	ei jenta vs. en stige a.F girl a.M ladder
5 M/F distinction in definite adjectival inflection	den fin-a jent-a vs. DEF nice-F girl-DEF.F den fin-e gutt-en DEF nice-M boy-DEF.M
6 Strong/weak distinction in feminine definite suffix	den jent-å vs. den skål-e that girl-DEF that bowl-DEF

However, so far only large cities have been investigated, and they may have patterns of change that are different from smaller and rural places. Furthermore, the investigated dialects all have in common that they display the syncretism illustrated in Table 1. There are, however, many other dialects in Norway where there is less syncretism, that is, where there are more unique cues for feminine gender. In Table 3, we illustrate the main six cues for feminine gender that we have focused on in this project.[1] The first five are distinctions between masculine and feminine forms, while the sixth cue is a distinction between so-called *weak* and *strong* feminine nouns. Strong nouns end in a consonant, e.g., *dør* 'door', while weak nouns are typically disyllabic and end in an *-e* (pronounced as schwa), e.g., *kake* 'cake'. Some dialects have maintained a distinction in the definite form of feminine nouns, so that the definite suffixal form depends not only on gender and number, but also on declension class (weak vs. strong).

Until now, it has not been investigated if cues like the ones in Table 3 play a role, and if so, what kind of role. It may also be that the six cues play different roles. For our purposes this is not a problem, as we are using these cues as a heuristic to identify relevant dialects for the present study. A main goal of the present paper is to investigate dialects that display more variation in their richness and expression of gender morphology, by focusing in particular on determiners and definite suffixes. In the next section we outline our research questions and hypotheses.

[1] The morphophonological realizations of the cues may vary between the dialects. For example, some dialects use the form *en* for the masculine indefinite determiner while others use *ein*. We analyze both forms as masculine indefinite determiners. For the purposes of our study, the exact morphophonological realization is less relevant. Rather, we focus on whether there is a distinction between masculine and feminine (or weak and strong feminines in cue 6).

3 Research questions and hypotheses

In this paper, we have two overarching research questions (RQs):

- RQ 1: To what extent is feminine gender disappearing from Norwegian dialects?
- RQ 2: What accounts for the diachronic development of feminine gender in Norwegian dialects?

The first research question can be rephrased informally as 'Do all places in Norway show the same pattern?' That is, is the disappearance of feminine gender typical of big cities also typical of small cities? And furthermore, what happens in places where there are more morphological distinctions between the masculine and the feminine? Our main hypothesis (H) is as follows:

H The disappearance of feminine gender is the result of an interplay between morphological gender cues and sociolinguistic factors (notably linguistic contact).

Although we will not be focusing a lot on the sociolinguistic factors in the present paper, they are still important for our methodology, as will become clear in the next section. There is some degree of overlap between the morphosyntactic richness of a dialect on the one hand, and the kind of place on the other hand: Urban dialects often have a simplified morphosyntax, whereas rural places tend to have a more complex morphosyntax (Neteland and Bugge 2015; Bugge and Neteland 2022). This also applies to gender cues.

Based on the general hypothesis, the present paper investigates the following sub-hypotheses applied to determiners and suffixes.

H1 Feminine gender is vulnerable across many dialects.

H2 Feminine gender is disappearing less quickly in places with more morphological cues for feminine.

H3 Feminine gender is disappearing less quickly in smaller places.

H4 The feminine indefinite determiner *ei* is disappearing but the definite suffix *-A* is not.

Regarding H1, this builds on existing research that demonstrates the vulnerability of feminine gender. Since syncretism is a key part of the explanation, we would expect that feminine gender is vulnerable in many dialects and places. Relatedly, H2 hypothesizes that feminine gender is less resilient towards change in places with fewer morphological cues for feminine. That is, feminine gender is more likely to be retained if there are more morphological cues supporting this category. H3 builds on H2 and the generalization that rural places often have a more complex morphosyntax. From this we hypothesize that feminine gender is more resilient in smaller places, where the size of the place is used as a proxy for linguistic contact broadly understood. Lastly, H4 suggests that the discrepancy between the feminine indefinite determiner and the feminine definite suffix holds across all places.

4 Method

4.1 Selection of locations and participants

In order to test our hypotheses, we collected production data in seven different locations in Norway (Figure 1), with two-three age groups in each location.

The locations for data collection were selected based on the following considerations: First, the locations are fairly spread out geographically, with Bodø as the northernmost location, and Lyngdal as the southernmost location. The

Fig. 1 Map showing the seven locations for data collection, in addition to the capital, Oslo. Illustration from The Norwegian Mapping Authority (Creative Commons Attribution ShareAlike 3.0). The illustration has been simplified. Source: https://www.kartverket.no/til-lands/kart/illustrasjonskart.

number of dialects and their geographical spread allow us to test H2 *Feminine gender is vulnerable across many dialects.*

Second, the dialects of the selected locations vary in how many feminine gender cues they traditionally have. As described in Sect. 2 and Table 3, Norwegian dialects vary considerably with respect to how the feminine and the masculine are distinguished morphologically. The dialects in our selection traditionally have the cues for feminine listed in Table 4.

The dialects of Bodø, Kristiansand and Trondheim traditionally have few feminine gender cues. They distinguish between feminine and masculine nouns in the indefinite determiner and the definite suffix (Cue 1 and 2), but not, for example, in their plural marking. In comparison, the dialects of Lyngdal and Mo i Rana have distinct plural suffixes for feminine and masculine nouns (Cue 3). The dialect of Mo i Rana also has distinct stem-final vowels on weak feminine and weak masculine nouns (Cue 4). The dialects of Egersund and Stavanger have the most feminine gender cues in our selection. These dialects mark the distinction between feminine and masculine gender also on the agreeing definite adjective (Cue 5). Finally, in addition to the aforementioned cues, the Egersund dialect also has distinct inflectional paradigms for strong and weak feminine nouns (Cue 6) (see van Baal et al. 2023 for further details on the morphology of each dialect). By selecting dialects that vary in the number of feminine cues they display, we are able to test H3 *Feminine gender is disappearing less quickly in places with more morphological cues for feminine.*

The third consideration in our selection of locations was their size. We use size here as a proxy for a cluster of properties: the population size, the amount of dialect contact within the area (bigger places have more mobility and therefore more dialects in contact), the urbanity of the place (bigger places are more urban, smaller places less so), the status of the dialect, and the dialect's influence on identity more generally. The selected locations vary in size, from bigger cities (on a Norwegian

Table 4 Gender cues in the traditional dialects

Bodø, Kristiansand, Trondheim	Cue 1, 2
Lyngdal[a]	Cue 1, 2, 3
Mo i Rana	Cue 1, 2, 3, 4
Stavanger[b]	Cue 1, 2, 3, 4, 5
Egersund	Cue 1, 2, 3, 4, 5, 6

[a] The Lyngdal dialect has previously made use of Cue 4 as well, and in our results, we find this cue in some of the older speakers (cf. Sect. 5.3 on this cue). Table 4 was developed as a heuristic by the researchers to select dialects that would be suitable for our study, and the results may naturally contain more variation and sometimes reveal other patterns than indicated by the table. Importantly, all of the cues were also elicited in our production tasks—although only the results for singular nouns are reported in this paper, thus allowing us to assess the validity of our initial assumptions.

[b] In Stavanger, the lower-class city dialect, which has a clear three-gender system abundant with feminine cues, long lived alongside an upper middle class city dialect with a clear two-gender system without any feminine cues (Berntsen and Larsen 1925; Omdal 1967; Gabrielsen 1984; Sandve 2022). This variation to some extent still exists today and may be hypothesized to play a role in the development of feminine gender in Stavanger. This makes Stavanger especially interesting for our investigation.

scale) like Trondheim, with a population of approximately 205,000 inhabitants, to smaller cities like Lyngdal with a population of approximately 10,300 inhabitants (SSB 2020). By considering places of various size, we can test hypothesis H4 *Feminine gender is disappearing less quickly in smaller places.* As mentioned in Sect. 3, 'urban jumping' is a common development in language change, where a new linguistic trend 'jumps' between urban areas before spreading to smaller places around these areas. Busterud et al. (2019) hypothesize that the ongoing loss of feminine gender follows this type of pattern. Therefore, our selection for the most part includes both a larger and a smaller city within the same region. Thus, Kristiansand–Lyngdal, Stavanger–Egersund and Bodø–Mo i Rana all form large–small pairs within the same region, where we would expect the larger city to have come further in the process of change.

As can be seen on the map (Figure 1), although the selected locations are fairly well spread out geographically, there is a certain concentration of locations on the southwestern coast of Norway. This choice was made because this area had not yet been investigated with the current methodology. Furthermore, this part of Norway shows a considerable amount of morphological variation despite short distances. This makes this area especially interesting for the investigation of our hypotheses. Finally, the selection of the seven locations was also influenced by practical and logistic considerations, such as existing local contacts and ease of travel for the researchers.

In each location, data was collected from two or three age groups following the standard methodology used in previous research (see Sect. 4.2). The three age groups were:

- Group A: primary school pupils, age 11–13
- Group B: high school students, age 18–19
- Group C: adults, age 25–75 (mean age across locations 50.73)

Groups B and C were tested in all seven locations. Group A was only tested in three locations; see overview in Table 5.

The group B participants are all very close in age, which makes it easy to compare their production across locations. Group C, on the other hand, comprises of a larger age range with some more variation across locations, although the mean age in each of the C-groups is still fairly similar (see Table 5). Group C serves as a reference point that we can compare the production of the high-schoolers to, and the age range within group C also allows us to get a general impression of how production may vary within such a large group.[2]

For practical reasons, Group A could only be included in some locations (cf. footnote 4). We therefore prioritized this group in the locations where we expected

[2] It can be mentioned that Group C initially started out as two different age groups that were later combined due to practical considerations and difficulty recruiting participants with the constraints of the Covid19 pandemic.

Table 5 Overview of locations and speakers per group

Place (population in 2020)	Age group	N of participants	Age (mean age)
Bodø (52,357)	B	20	18–19
	C	21	26–71 (51.45)
Egersund (14,811)	A	20	13
	B	21	17–19
	C	24	29–71 (48.46)
Kristiansand (111,633)	B	19	18
	C	22	30–78 (55.68)
Lyngdal (10,365)	B	19	17-19
	C	19	30–88[a] (57.79)
Mo i Rana (26,184)	A	18	11
	B	19	18–19
	C	18	29–71 (52.27)
Stavanger (133,703)	A	19	12–13
	B	21	17–19
	C	25	25–75 (51.16)
Trondheim (205,163)	B	18	18–19
	C	24	25–68 (40.67)

[a] Although we were mainly aiming for participants aged 25–75 in group C, we decided to also include one participant aged 88 in Lyngdal due to challenges with recruiting enough participants.

it to be most insightful for our hypotheses. For example, if it is really the case that both the morphology of the dialect and the size of the location play a role in the ongoing change, then we would expect the three-gender systems of Egersund and Mo i Rana to be fairly robust. This makes it especially interesting to compare the production of the children and high-schoolers in these locations.

Each age group in each location has around 20 participants. Participants had to have Norwegian as (one of) their L1(s), and they had to have grown up in the local area and lived there most of their lives. In the analysis, a few participants who did not show a stable use of the neuter indefinite determiner were excluded, as this would indicate a general instability in their entire gender system, and not just in the feminine vs. masculine, which is the focus of the current study.[3]

4.2 Elicitation task

We conducted a picture-aided elicitation task designed to elicit definite and indefinite singular nouns with adjectives. A similar task has previously been used for the dialects of Tromsø and Trondheim (Rodina and Westergaard 2015; Busterud et al. 2019), as well as with bilingual children (Rodina and Westergaard 2017) and heritage speakers of Norwegian (van Baal 2020). Importantly, the speakers were

[3] It is an interesting observation in itself that a few participants did not use the neuter indefinite determiner in a stable way. It is not immediately clear what causes this instability, and we leave a closer investigation of these speakers as a topic for future research.

instructed to speak as they would ordinarily do, which for all of the included participants meant their local dialect.

The procedure was as follows: Participants were shown a screen with a target noun depicted in two different colors (Figure 2). They were asked to describe what they saw, which elicited indefinite phrases.[4] Next, one picture would disappear, and they would say what disappeared, which elicited a definite phrase. An example dialog with the relevant glosses is provided in (1).

(1) *Researcher*

Hva ser du her?
'What do you see here?'

Participant

En	grønn	traktor	og	en	rød	traktor
a.INDF.SG.M	green	tractor	and	a.INDF.SG.M	red	tractor

'A green tractor and a red tractor'

Researcher

Hva skjedde nå?
'What happened now?'

Participant

Den	grønne	traktor-en	forsvant
the	green	tractor-DF.SG.M	disappeared

'The green tractor disappeared.'

This task elicits two indefinite determiners and one definite suffix per noun. 32 nouns were included: masculine (n=8), feminine (n=16), neuter (n=8) (all nouns are listed in Appendix 1). Since the goal of the project is to study the ongoing

[4] The researcher explained the tasks and went through the practice sessions, and from then on, the participant did most of the talking. Several researchers were involved in the data collection, and they all spoke slightly different dialects. In general, the researcher did not speak the dialect of the relevant location, which has also been the case in previous work on grammatical gender (Rodina and Westergaard 2015; Busterud et al. 2019). Although we cannot completely exclude the possibility that the dialect of the researcher affected the results in some way, the consistency and unity of the results across locations, age groups and researchers suggest that this did not happen.

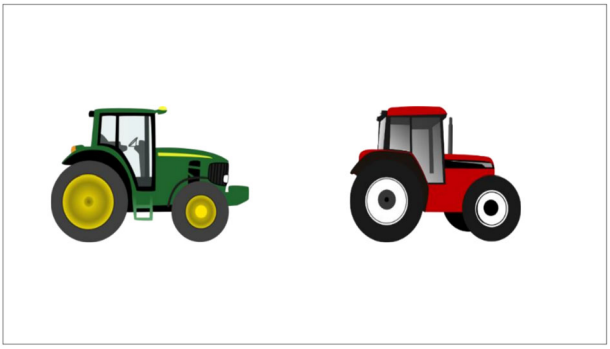

Fig. 2 A screen from the elicitation task showing a green tractor and a red tractor

change of the feminine, we included a higher number of feminine nouns than masculine and neuter nouns.

In some dialects, strong and weak nouns receive different inflection (cf. Cue 6). To see if declension class plays a role in the ongoing change, half of the selected nouns within each gender were weak and half were strong. We selected nouns that (to the best of our knowledge) have the same gender across the dialects that were tested.[5] Finally, we made sure that the nouns were easy to depict and could naturally be combined with different color adjectives. Further details of the selection criteria for nouns are provided in van Baal et al. (2023).

The task was introduced by three practice items that occurred before the 32 test items. The test items were randomized, but all participants saw them in the same order. The pictures were displayed on a laptop screen in a quiet room with only one participant and one researcher present. The responses were audio recorded. They were later transcribed by the researchers and two research assistants, and finally counted and analyzed by the researchers.

5 Results

5.1 The indefinite determiner

In all groups, the masculine and neuter indefinite determiner are used in a stable way. At the group level, masculine nouns occur with the masculine determiner *en* (or *ein*) more than 95% of the time. Neuter nouns are combined with the neuter indefinite determiner *et* in more than 97% of the instances. There is no indication of change in the masculine or neuter gender. In general, we do not see any item effects (though see footnote 10 below).

[5] This was based on previous descriptions of the dialects. For practical reasons, it was not always possible to follow this criterion, and we observe some variation in gender assignment, which we discuss in the Results sections. Given that we investigate ongoing changes in the gender system, it is natural that there is some variation between dialects, generations, and speakers.

Table 6 Use of the feminine indefinite determiner *ei*, group scores for high-school students and adults

	B-group (17–19 years)		C-group (25–75 years)	
Mo i Rana	94.28%	(560/594)	98.21%	(549/559)
Egersund	79.33%	(522/658)	90.14%	(667/740)
Bodø	36.94%	(232/628)	94.74%	(613/647)
Lyngdal	21.04%	(126/599)	87.23%	(485/556)
Kristiansand	12.12%	(72/594)	64.94%	(452/696)
Trondheim	11.82%	(67/567)	38.74%	(294/759)
Stavanger	0.61%	(4/657)	43.31%	(343/792)

However, the picture is rather different for the feminine gender. We first discuss the results from the high-school students (B-group) and adults (C-group) in all seven locations, and then turn to the three locations where we also included children (A-group). Table 6 and Fig. 3 show the frequency of the feminine indefinite determiner *ei*. There is much variation between the different groups.

In addition to the variation between the participant groups, we also find variation within the groups, as there are differences between individual speakers. In Table 7, we have divided the speakers into four groups: those that never use *ei,* those that use *ei* less than 50% of the time, those that use *ei* more than 50% of the time, and those that use *ei* consistently (defined as ≥90%).

The results in Tables 6 and 7 indicate that there is variation in the use of the indefinite determiner *ei* with feminine nouns. This variation is found on the group levels, and also when we look at individual patterns. In some groups, many participants use *ei* consistently (e.g., Bodø-C), while there are many speakers who never used *ei* in other groups (e.g., Stavanger-B). The variation seems related to the factors location and age group. We ran a binomial mixed effects model (glmer-function of the R-package *lme4*, Bates et al. 2015) with location and age group as predictors. The reported *p*-values were obtained by model comparison using the Anova-function in R. All models include random effects for participant and lexical item. In addition, pairwise comparisons were conducted with the emmeans-function. See Appendix 2 for the full output of the statistical models.

The binomial mixed effects model reveals a statistically significant effect of location (χ^2=148.12, *df*(6), $p < 0.0001$) and age group (χ^2=50.187, *df*(1), $p < 0.0001$). There is also an interaction effect (χ^2= 45.29, *df*(6), $p < 0.0001$), which indicates that the difference between the high-schoolers (B-group) and adults (C-group) is not equal across locations. This can also be seen in Table 6 above: while the two age groups in Mo i Rana use feminine to a similar degree, there is a larger difference in Lyngdal, for example.

In each of the seven places, the adults use *ei* more frequently than the high school students. Pairwise comparisons reveal that there is a statistically significant difference between the B-group and the C-group in Bodø ($p < 0.0001$), Kristiansand ($p < 0.0001$), Lyngdal ($p < 0.0001$), Stavanger ($p < 0.0001$), and Trondheim ($p < 0.01$), but not in Egersund ($p \approx 0.81$) and Mo i Rana ($p \approx 0.82$). In these two

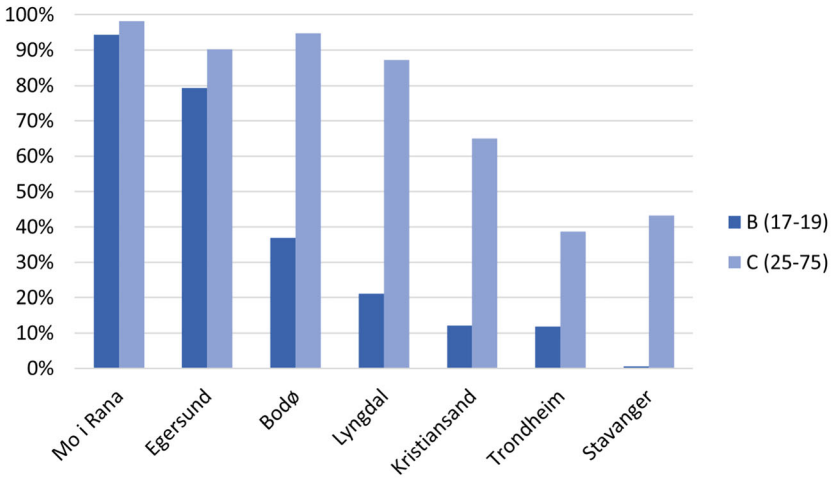

Fig. 3 Use of feminine indefinite determiner *ei*, group scores for high-school students and adults

locations, both adults and high-schoolers use the feminine determiner *ei* frequently, whereas clear differences can be observed in the other five places, indicating a change.[6]

In the adult groups, feminine *ei* is used in over 90% in Bodø, Egersund, and Mo i Rana, and Lyngdal is close to this (87.23%). There are no adults in these places that never use *ei*. The adults in Kristiansand, Stavanger, and Trondheim use *ei* much less and there are even speakers in these locations that never use *ei*. For the adults, there thus seem to be two clusters of locations with relatively similar use of feminine.

However, the pairwise comparisons indicate that there instead is a cline in the use of *ei*, rather than completely distinct groups. We illustrate this cline by the position of Kristiansand. There is a statistically significant difference between the adults in Kristiansand and those in Bodø ($p \approx 0.01$) and Mo i Rana ($p < 0.001$), but not between Kristiansand and Egersund, Lyngdal, Stavanger, or Trondheim. However, pairwise comparisons also reveal that Egersund and Lyngdal pattern more together with each other, and so do Stavanger and Trondheim (see Attachment 2 for all pairwise comparisons). In our interpretation, this indicates that there is a cline in the use of feminine indefinite *ei* in adults, and Kristiansand takes a somewhat middle position on this cline.

In the high-school groups (B-groups), the pairwise comparisons reveal that Mo i Rana and Egersund are statistically significantly different from all other locations.

[6] Throughout the paper, we take an apparent-time approach to investigate the diachronic development of the feminine gender. An anonymous reviewer asks whether it is possible that the limited use of feminine determiners by high-schoolers might be part of a register that they will use less later in life. This is an empirical question that future research will have to investigate. However, we think this is unlikely. In the locations where children (age 10–12) were included, we observe differences between the children and the high-schoolers. In addition, we also find an age effect in the group of adults. This suggests that loss of the feminine is not a case of age grading, but a true diachronic change. Previous research has not found reason to believe that the high-schoolers will start using more *ei* later in their lives.

Table 7 The use of the indefinite determiner *ei* with feminine nouns. N participants/total. Largest group in bold

Place	Age	N of participants who use			
		0% *ei*	1–49% *ei*	50–89% *ei*	≥ 90% *ei*
Mo i Rana	B (17–19)	0/19	1/19	2/19	16/19
	C (25–75)	0/18	0/18	0/18	18/18
Egersund	B (17–19)	0/21	3/21	6/21	12/21
	C (25–75)	0/24	1/24	3/24	20/24
Bodø	B (17–19)	9/20	3/20	4/20	4/20
	C (25–75)	0/21	0/21	2/21	19/21
Lyngdal	B (17–19)	8/19	6/19	4/19	1/19
	C (25–75)	0/18	1/18	4/18	13/18
Kristiansand	B (17–19)	16/19	0/19	3/19	0/19
	C (25–75)	4/22	3/22	2/22	13/22
Trondheim	B (17–19)	11/18	5/18	1/18	1/18
	C (25–75)	9/24	4/24	5/24	6/24
Stavanger	B (17–19)	20/21	1/21	0/21	0/21
	C (25–75)	8/25	6/25	3/25	8/25

As we have pointed out above, *ei* is frequently used by high-schoolers in both places. There is also a statistically significant difference between Mo i Rana and Egersund ($p < 0.05$), so we may be observing the start of a change in Egersund. The other five locations, however, position themselves on a cline rather than as distinguishable groups. Bodø and Lyngdal are on one end of this cline, and Stavanger is at the other end. In Stavanger, the feminine indefinite determiner *ei* is virtually lost, and only a single speaker produces a handful of occurrences.

In three of the locations, we included a third participant group of primary school children (age 11–13). The results from these locations (Egersund, Mo i Rana, and Stavanger) are presented in Table 8 and Figure 4. For convenience, we repeat the results of the high-school students and adults in these locations. Data on individual use of *ei* is presented in Table 9.

The data show variation related to age group and location, and the results from the three places look very different. Indeed, the binomial mixed effects model reveals a statistically significant effect of location ($\chi^2 = 164.84$, $df(2)$, $p < 0.0001$) and age group ($\chi^2 = 16.364$, $df(2)$, $p < 0.001$), as well as an interaction effect ($\chi^2 = 27.214$, $df(4)$, $p < 0.0001$). In general, younger participants use less *ei*, but the differences between age groups vary from location to location.

Pairwise comparisons within the age groups reveal differences between the three locations in all age groups. In other words, the children in Mo i Rana use significantly more *ei* than the children in Egersund ($p = 0.0001$) and Stavanger ($p < 0.0001$), and the children in Egersund use significantly more *ei* than in Stavanger (p

Table 8 Use of the feminine indefinite determiner *ei*, group scores for children, high-schoolers, and adults

	A-group (10–12 years)		B-group (17–19 years)		C-group (25–75 years)	
Mo i Rana	88.75%	(489/551)	94.28%	(560/594)	98.21%	(549/559)
Egersund	41.55%	(258/621)	79.33%	(522/658)	90.14%	(667/740)
Stavanger	5.34%	(32/599)	0.61%	(4/657)	43.31%	(343/792)

< 0.0001). The same is true for the high-school students and for adults (see Appendix 2 for all pairwise comparisons).[7]

If we compare the age groups within each location, we also find three different patterns. In Mo i Rana, there is a statistically significant difference between the children and the adults ($p < 0.05$), but not in the other comparisons. Here, the loss of feminine *ei* seems to be at its starting point. In Egersund, the children are statistically significantly different from the high-schoolers ($p < 0.01$) and from the adults ($p=0.0001$), but the latter two are not different from each other ($p \approx 0.8879$). Here, the change is happening in the children but not in the older groups. In Stavanger, however, the picture is opposite: there is a statistically significant difference between the adults and the children ($p < 0.001$) and between adults and high-schoolers ($p < 0.01$), but not between the children and high-schoolers ($p \approx 0.4911$). The change has come further here, such that *ei* has almost completely disappeared from the two younger groups.

For the adult group, we recruited participants from a wide age range (25–75 years). The mean age in the C-group varies across locations (see Section 4.1). We may expect that age plays a role within the C-group, and not only in comparing the C-group to the B-group and A-group as done above. We therefore ran an additional binomial mixed effects regression model with age as a continuous (and centered) variable. Only the C-group was included in this model. The results reveal that there is a statistically significant effect of age ($\chi^2=9.9368$, $df(1)$, $p < 0.01$), such that younger participants of the adult group use somewhat less *ei* than the older participants in this group. As expected given the results presented above, this model also reveals a statistically significant effect of location ($\chi^2=75.915$, $df(6)$, $p < 0.0001$). However, there is no interaction effect ($\chi^2=10.005$, $df(6)$, $p \approx 0.1244$), suggesting that the effect of age within the adult group is similar across the different locations.

[7] That there is a statistically significant difference between the adults in Mo and in Egersund ($p < 0.05$ in the model with only B and C groups; $p < 0.01$ in the model with three age groups), may be a bit surprising. In both groups, *ei* is used frequently, and consistently by most adults. The somewhat lower score in Egersund (90.14%) may be particularly due to the lexical item *pil* 'arrow', which very frequently gets the masculine indefinite determiner (*en*) and definite suffix (*-en*). This lexical item may be masculine for some speakers in the Egersund dialect. If it is excluded, the score of *ei* in the adults in Egersund goes up to 94.39% (656/695).

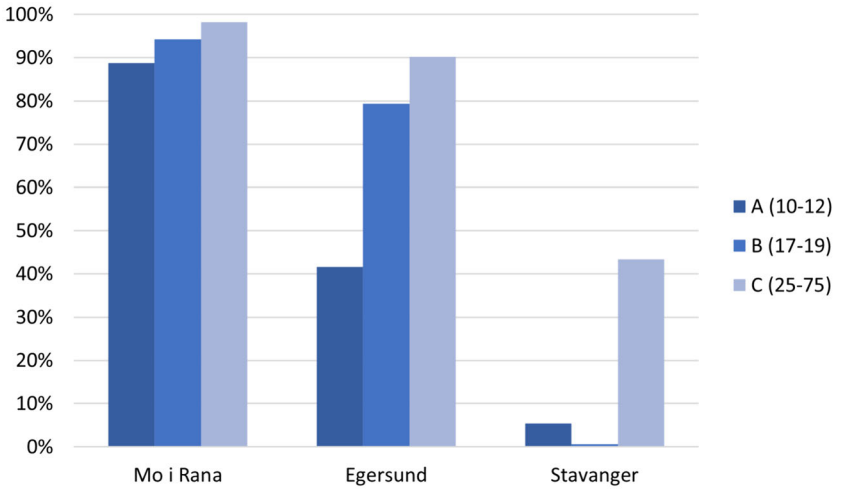

Fig. 4 Use of the feminine indefinite determiner *ei*, group scores for children, high-schoolers, and adults

Table 9 Use of the indefinite determiner *ei* with feminine nouns. N participants/total. Largest group in bold

Place	Age	N of participants who use			
		0% *ei*	1–49% *ei*	50–89% *ei*	≥ 90% *ei*
Mo i Rana	A (10–12)	0/18	2/18	3/18	13/18
	B (17–19)	0/19	1/19	2/19	16/19
	C (25–75)	0/18	0/18	0/18	18/18
Egersund	A (10–12)	3/20	9/20	5/20	3/20
	B (17–19)	0/21	3/21	6/21	12/21
	C (25–75)	0/24	1/24	3/24	20/24
Stavanger	A (10–12)	17/19	1/19	0/19	1/19
	B (17–19)	20/21	1/21	0/21	0/21
	C (25–75)	8/25	6/25	3/25	8/25

In summary, for the indefinite determiner there is variation between locations, groups, and at the individual level. Importantly, the difference between age groups is not equal across locations. Furthermore, we have argued that the results justify an interpretation where rather than completely distinct groups, we see a cline in the use of the feminine indefinite article *ei*.

5.2 The definite suffix

There is no change in the definite suffixes on masculine and neuter nouns. In all groups, masculine nouns get the suffix *-en* and neuter nouns the suffix *-et* in more

Table 10 Use of the feminine definite suffix *-A*, group scores for high-school students and adults

	B-group (17–19 years)		C-group (25–75 years)	
Lyngdal	100%	(302/302)	98.10%	(258/263)
Mo i Rana	99.67%	(299/300)	99.67%	(299/300)
Bodø	98.42%	(312/317)	99.08%	(319/322)
Trondheim	97.18%	(276/284)	99.21%	(379/382)
Egersund	96.69%	(321/332)	95.47%	(358/375)
Kristiansand	87.58%	(261/298)	98.29%	(345/351)
Stavanger	36.28%	(119/328)	65.08%	(259/398)

than 95% of occurrences.[8] Masculine and neuter gender are used in a stable way on both indefinite determiners and definite suffixes.

Table 10 presents the frequency of the feminine definite suffix in the high-school and adult groups. This is also displayed in Figure 5. The dialects included in this study have different realizations of the feminine definite suffix: *-a, -o, -å,* and *-e*. The data reported here include all these realizations into a single score, and we refer to the definite suffix with its various realizations as the *A-suffix* or *-A*. We report individual patterns of use in Table 11 below, where participants are divided into four groups: those that never use *-A*, those that use *-A* in less than 50% of the feminine nouns, those that use *-A* in over 50%, and those that use *-A* consistently (≥ 90%).

The first pattern we can observe in these data is that the use of the definite suffix *-A* is strikingly different form the use of the indefinite determiner *ei* discussed in the previous section. Unlike the indefinite determiner, the definite suffix is highly stable. In almost all participant groups, the suffix is used with over 90% of the feminine nouns, and most participants use the suffix consistently. However, Stavanger is an exception from this stability. Here, the definite suffix is used less, fewer speakers use it consistently, and there are even speakers who never use the definite suffix *-A* (which is typically realized as *-å* in this dialect).

The high-school students (B-group) in Kristiansand score somewhat lower (87.58%). This is mainly the result of two speakers who use *-A* very infrequently (6.67% and 31.25%, respectively). It is not completely clear why, but they are an

[8] The only exception is the B-group in Kristiansand, where the masculine suffix *-en* is used on 85.33% of the masculine nouns. This is mainly related to the weak masculine nouns that sometimes get the *-a* suffix (e.g., *kjola* instead of *kjolen* 'the dress'). Several lexical items that are weak masculines in most dialects, are traditionally feminine in the Kristiansand dialect. This tendency has survived until today (Kvinlaug 2011), and also seems present in our data. The vast majority of masculine nouns, however, still combine with the masculine suffix.

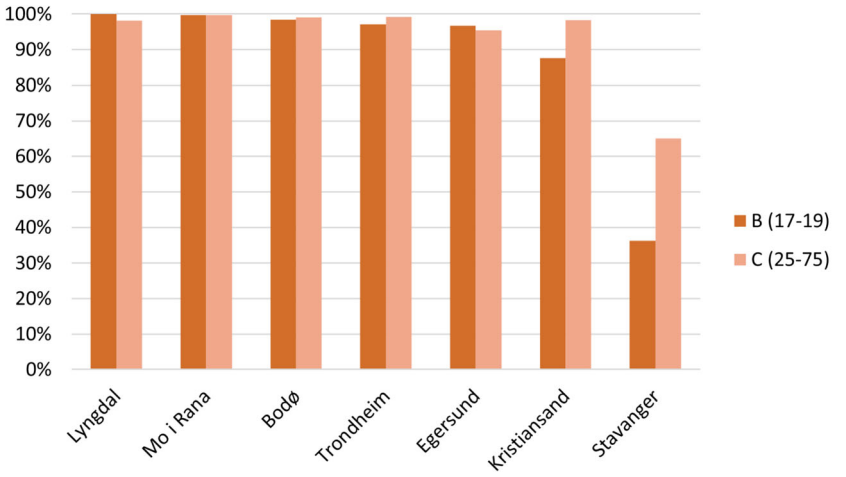

Fig. 5 Use of the feminine definite suffix *-A*, group scores for high-school students and adults

exception in the group.[9] If they are excluded from the data, the B-group in Kristiansand uses the *-A* suffix in 95.5% of instances (255/267).

The binomial mixed effects regression model reveals a statistically significant effect for location ($\chi^2=90.647$, $df(6)$, $p < 0.0001$), but not for age group ($\chi^2=0.4525$, $df(1)$, $p \approx 0.5011$). There is a statistically significant interaction effect ($\chi^2=24.581$, $df(6)$, $p < 0.001$). The results in the tables above reveal that there only are differences between the age groups in some of the locations. This is confirmed by pairwise comparisons within the locations. These reveal that there are no statistically significant differences between high-schoolers and adults in most locations. Typically, both groups use *-A* in a stable way. However, there is a statistically significant difference in Kristiansand ($p < 0.01$) and in Stavanger ($p < 0.01$). As noted, the effect in Kristiansand may be due to two participants in the B-group who use *-A* with atypical low frequency.

When we compare the locations within the two age groups, it becomes clear that Stavanger is 'the odd one out'. In the adult group, all pairwise comparisons where Stavanger is involved are statistically significant, and these are also the only comparisons that turn out significant (see Attachment 2 for all comparisons). In the high-school group, all pairwise comparisons with Stavanger are statistically significant.[10] In addition, there is a statistically significant difference between

[9] Like all participants, both these speakers have Norwegian as their first language. However, both are bilingual from a young age and have lived some of the first years of their lives abroad. One of the speakers also has one parent who is an L2-speaker of Norwegian. This may be part of an explanation of why these two participants behave differently from the other Kristiansand speakers. Yet, their use of neuter gender is stable, and the data from Stavanger show that speakers who grew up in Norway may also lose the definite suffix *-A*.

[10] The pairwise comparisons are conducted on a dataset without Lyngdal. In Lyngdal, there is no variation in the use of definite *-A* by the highschoolers, as they all use *-A* in 100% of cases. The lack of variation in this group is somewhat problematic for the statistical model and leads to extremely large standard errors and large p-values (the Hauck-Donner effect). We therefore ran the emmeans-function

Table 11 Use of the definite suffix *-A* with feminine nouns. N participants/total. Largest group in bold

Place	Age	N of participants who use			
		0 % *-A*	1–49% *-A*	50–89% *-A*	≥ 90% *-A*
Lyngdal[a]	B (17–19)	0/19	0/19	0/19	19/19
	C (25–75)	0/17	0/17	0/17	17/17
Mo i Rana	B (17–19)	0/19	0/19	0/19	19/19
	C (25–75)	0/18	0/18	0/18	18/18
Bodø	B (17–19)	0/20	0/20	0/20	20/20
	C (25–75)	0/21	0/21	0/21	21/21
Trondheim	B (17–19)	0/18	0/18	2/18	16/18
	C (25–75)	0/24	0/24	0/24	24/24
Egersund	B (17–19)	0/21	0/21	2/21	19/21
	C (25–75)	0/24	0/24	0/24	24/24
Kristiansand	B (17–19)	0/19	2/19	3/19	14/19
	C (25–75)	0/22	0/22	1/22	21/22
Stavanger	B (17–19)	7/21	6/21	4/21	4/21
	C (25–75)	5/25	4/25	4/25	12/25

[a] One of the adults in Lyngdal produced mainly definite phrases with ellipsis of the noun (e.g., *den grønne* 'the green one' for *den grønne traktoren* 'the green tractor'). The data from this participant are therefore not included in the results for the definite suffix, and the C-group consists of 17 participants (18 participants in the indefinite condition; see Table 7).

Kristiansand and Mo i Rana ($p < 0.05$), which again may be related to the few participants in Kristiansand who don't use *-A* frequently. The other pairwise comparisons are not significant.

From the results above, we can conclude that the definite suffix *-A* is stable with feminine nouns, except in Stavanger. This becomes even clearer when we include the data from the children (A-group). The results of the three locations where we included the A-group are presented in Tables 12 and 13 and Fig. 6. To allow for comparison, we repeat the data from the other age groups in these locations.

The binomial mixed effects model reveals a statistically significant effect of location (χ^2=123.57, *df*(2), $p < 0.0001$), and an interaction effect for age group and location (χ^2=14.927, *df*(4), $p < 0.01$), but no significant main effect for age group (χ^2=4.4788, *df*(2), $p \approx 0.1065$). Pairwise comparisons within the places show that there are no differences between the three age groups in neither Egersund nor Mo i Rana. In Stavanger, the adults use significantly more *-A* than the high-schoolers ($p < 0.01$) and the children ($p < 0.001$), but the latter two are not different from each other ($p \approx 0.4911$).

Pairwise comparisons across locations show again that Stavanger is different from the other places. In all three age groups, Stavanger is statistically different from both Egersund and Mo i Rana. There is a statistically significant difference

Footnote 10 continued
excluding Lyngdal. The numerical data show, however, that the high-schoolers in Lyngdal pattern with those in other locations and are unlike their peers in Stavanger.

Table 12 Use of the definite suffix *-A* on feminine nouns, group scores for children, high-school students, and adults

	A-group (10–12 years)		B-group (17–19 years)		C-group (25–75 years)	
Mo i Rana	98.94%	(281/284)	99.67%	(299/300)	98.60%	(281/285)
Egersund	92.09%	(291/316)	96.69%	(321/332)	95.47%	(358/375)
Stavanger	28.90%	(87/301)	36.28%	(119/328)	65.08%	(259/398)

Table 13 Use of the definite suffix *-A* with feminine nouns. N participants/total. Largest group in bold

Place	Age	N of participants who use			
		0 % *-A*	1–49% *-A*	50–89% *-A*	≥ 90% *-A*
Mo i Rana	A (10–12)	0/18	0/18	1/18	17/18
	B (17–19)	0/19	0/19	0/19	19/19
	C (25–75)	0/18	0/18	0/18	18/18
Egersund	A (10–12)	0/20	0/20	5/20	15/20
	B (17–19)	0/21	0/21	2/21	19/21
	C (25–75)	0/24	0/24	0/24	24/24
Stavanger	A (10–12)	10/19	3/19	3/19	3/19
	B (17–19)	7/21	6/21	4/21	4/21
	C (25–75)	5/25	4/25	4/25	12/25

between Egersund and Mo i Rana in the youngest group ($p < 0.02$), but not in the other groups. Also, the children in both Egersund and Mo i Rana use *-A* with high frequency, so it is unclear whether there is an actual actuation of change in Egersund or rather a few children that use *-A* somewhat less.

5.3 Weak and strong feminine nouns

As described in Section 4 above, we included both weak and strong feminine nouns. Weak nouns end in an unstressed vowel (e.g., *klokke* 'clock'), while strong nouns end in a consonant (e.g., *dør* 'door'). The *-e* ending has been argued to be a reliable predictor for feminine gender assignment (Urek et al. 2022), but previous studies in Tromsø and Trondheim found that feminine gender is disappearing on weak nouns ending in *-e* (or *-a* in the Tromsø dialect) as well (Rodina and Westergaard 2015; Busterud et al. 2019).

In our data, we typically do not see a difference between weak or strong feminine nouns in the use of feminine *ei* or the *-A* suffix. In most groups, there is only a very small difference between the two categories, see Table 14. The adults in Bodø, for example, use *ei* on 94.15% of the strong feminine nouns and 95.34% of the weak feminine nouns (i.e., frequent with both), and the high-school students in Kristiansand use *ei* with 12.33% of the strong feminine nouns and 11.9% of the weak feminine nouns (i.e., infrequent with both). We do not interpret these differences as meaningful. However, there are a few groups where there seems to be

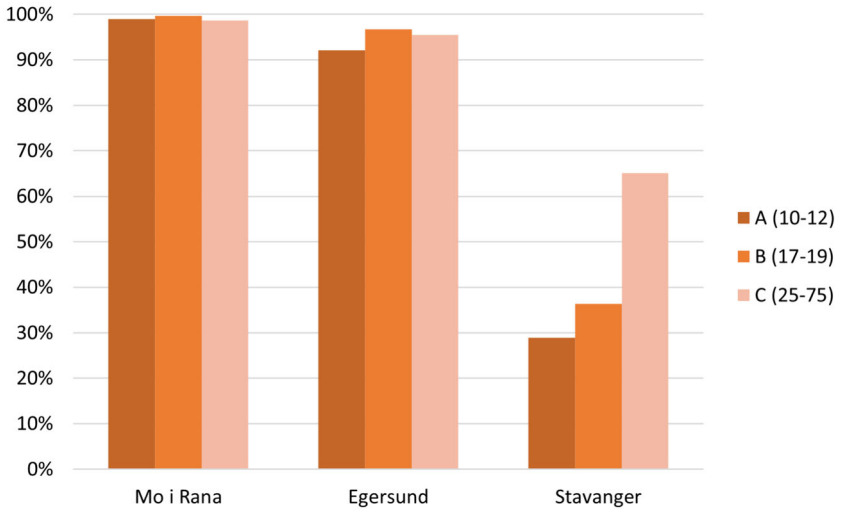

Fig. 6 Use of the feminine definite suffix *-A*, group scores for children, high-school students, and adults

a somewhat larger numerical difference between strong and weak nouns when it comes to the choice of the feminine determiner *ei*. In Table 14, the bold values indicate these groups where we consider the difference between strong and weak nouns as potentially meaningful.

In the six highlighted groups, we see that there is somewhat more use of *ei* with weak feminine nouns than with strong feminine nouns. It is interesting to note that in the places highlighted in Table 14, weak feminines end in *-a* rather than the *-e* in the other dialects (and written language). We have counted this as an extra cue for the masculine-feminine distinction (Cue 4, see Sect. 2 above) and hypothesize that more of such cues may prevent the loss of feminine gender. Potentially, this cue may also prevent (or delay) the change in weak nouns specifically. Another interesting observation is that the biggest distinctions are found in the children and high-school students in Egersund.[11] This is the place where the loss of feminine seems to have started recently, while the change is progressed further or almost complete in the other high-schooler groups. It could be that the weak-strong distinction is only relevant in the early stages of the language change, which would explain why no effect was found in the previous studies in Tromsø and Trondheim, where the change has progressed much further already. At that stage, feminine *ei* is disappearing with strong and weak nouns alike, which is what we also see in most of our speaker groups.

As described in the previous section, almost all groups (and speakers) use the definite suffix *-A* with high frequency. This is true for both weak and strong nouns: in most groups, both types of feminine nouns combine with the *A*-suffix in more

[11] We noted in footnote 10 that the noun *pil* 'arrow' may be a masculine (rather than strong feminine) noun in the Egersund dialect. However, if we exclude this noun, there is still a difference between strong and weak feminine nouns in the A- and B-group in Egersund (not in the C-group).

Table 14 Use of feminine indefinite determiner *ei* on strong versus weak feminine nouns

Place	Age	Strong feminine	Weak feminine
Bodø	B (17–19)	37.03%	36.86%
	C (25–75)	94.15%	95.34%
Egersund	A (11–13)	37.05%	45.89%
	B (17–19)	69.58%	89.26%
	C (25–75)	84.32%	95.95%
Kristiansand	B (17–19)	12.33%	11.90%
	C (25–75)	63.98%	65.90%
Lyngdal	B (17–19)	20.60%	21.48%
	C (25–75)	84.17%	90.29%
Mo i Rana	A (11–13)	87.68%	89.53%
	B (17–19)	90.64%	97.97%
	C (25–75)	98.20%	98.22%
Stavanger	A (11–13)	5.30%	5.39%
	B (17–19)	0.60%	0.62%
	C (25–75)	40.66%	45.96%
Trondheim	B (17–19)	13.73%	9.89%
	C (25–75)	36.91%	40.58%

than 90% of instances. The few groups that are an exception to this are presented in Table 15. As explained above, the high-schoolers in Kristiansand score somewhat low because of two individuals. We do not interpret the difference between weak and strong nouns in this group as meaningful. However, we observe some larger differences in all age groups in Stavanger, which is the location where the definite suffix is disappearing from feminine nouns (see Sect. 3.2 above). Table 15 shows that the *-A* suffix is maintained more on weak than on strong nouns. This can also be observed in the children in Egersund: weak feminines consistently get the *-A* suffix (typically dialectal realization *-å*), while this happens below 90% with strong feminine nouns.

The weak-strong distinction is particularly relevant in dialects with a so-called 'split feminine'. Egersund is the only location is our sample that has this feature, which means that strong feminine nouns receive a different definite suffix (*-e*) than weak feminine nouns (*-å*), illustrated in Table 16. (Recall that weak feminine nouns end in *-a* in Egersund.)

In our data, the split feminine system is generally robust in Egersund. However, we observe some cases of overuse of the weak definite *-å* suffix on strong nouns (e.g., *seng-å* rather than *seng-e* 'the bed'). In addition, we also find some instances of the more 'standard-like' definite *-a* suffix, on both weak and strong feminine nouns (e.g., *geit-a* 'the goat' and *stjern-a* 'the star' instead of *geit-e* and *stjern-å*,

Table 15 Use of definite suffix *-A* on strong versus weak feminine nouns

	Strong	Weak
Egersund, A (10–12)	84.08%	100%
Kristiansand, B (17–19)	86.09%	89.12%
Stavanger, A (10–12)	23.68%	34.23%
Stavanger, B (25–75)	28.31%	44.44%
Stavanger, C (25–75)	61.81%	68.34%

respectively). There seems to be an age effect here, in that the children (A-group) are less consistent with their split feminine than the high-schoolers and adults (B- and C-group). With one exception, all participants have preserved the split feminine system to a certain degree.[12]

6 Discussion

This study addresses two research questions: *To what extent is feminine gender disappearing from Norwegian dialects?* (RQ1), and *What accounts for the diachronic development of feminine gender in Norwegian dialects?* (RQ2). As described in Sect. 3, our main hypothesis (H) is that the disappearance of feminine gender is the result of an interplay between gender cues and sociolinguistic factors (notably linguistic contact). Specifically, we formulated 4 hypotheses, that are repeated below.

H1 Feminine gender is vulnerable across many dialects.

H2 Feminine gender is disappearing less quickly in places with more morphological cues for feminine.

H3 Feminine gender is disappearing less quickly in smaller places.

H4 The feminine indefinite determiner *ei* is disappearing but the definite suffix *-A* is not.

6.1 Differences and similarities across locations

The results presented in the previous section indicate that there is an ongoing change in Norwegian dialects that affects the feminine gender. However, in all locations and all age groups, the masculine and neuter genders are used in a stable way.[13] In other words, grammatical gender is not lost completely, but the

[12] There is one speaker in the B-group who never uses the *-e* suffix on strong nouns, and very few *-å* suffixes on weak nouns. She typically uses *-a* as a feminine definite suffix and may have lost the split feminine system. There is no clear explanation for this: she grew up in Egersund to parents who are both from Egersund and (reportedly) speak the local dialect.

[13] Recall that we excluded the very few speakers who did not use the neuter indefinite determiner in a stable way (see Sect. 4.1). Their use of grammatical gender is left for future research.

Table 16 The traditional split feminine system in Egersund.

	Indefinite	Definite
Strong feminine	*ei seng* 'a bed'	*seng-e* 'the bed'
Weak feminine	*ei klokka* 'a clock'	*klokk-å* 'the clock'

feminine indefinite determiner *ei* is disappearing and replaced by the masculine determiner *en*.

The results furthermore show that the factors age and location influence the use of the feminine indefinite determiner. In all places that we investigated, there is a decline in feminine gender. In Mo i Rana, feminine is used frequently by the children, but even here we are probably observing the start of a change, as there is a difference with the older two groups that have a robust three-gender system. In the other locations, we observe clearer differences between the age groups. Younger participants use less *ei* than older participants.

The change has not come equally far in all locations. In Egersund, the loss of the feminine appears to have started relatively recently, as high-schoolers use it quite frequently and it is also still in use in some of the children. In Lyngdal and Bodø, the adults use *ei* in a stable way, but there is a large difference between adults and high-schoolers. The latter group uses *ei* much less, which suggests that the change has happened very fast. These places are changing towards a two-gender system. In Kristiansand and Trondheim, we observe very little *ei* in the younger participants and it is even virtually absent in children and high-schoolers in Stavanger. In these three places, we also observe a change in the adults, as they do not use *ei* consistently either. We conclude from this that the change appears to have progressed further in these places, and that the younger speakers have a two-gender system with masculine (or common) and neuter gender.

Our results show that the loss of the feminine previously documented for Oslo (Opsahl and Nistov 2010; Lødrup 2011; Lundquist and Vangsnes 2018; Hårstad and Opsahl 2022), Tromsø (Rodina and Westergaard 2015, 2021), and Trondheim (Busterud et al. 2019) is not restricted to these places. We investigated Trondheim and six locations not previously documented, and it is clear that feminine gender is vulnerable to change across Norwegian dialects, in line with H1. Until now, only large cities had been investigated, and we also observe the change in the three large cities in our study (Trondheim, Kristiansand, Stavanger). Importantly, however, it is clear that the change is not restricted to these large cities. We also observe it in the medium-sized city of Bodø, and in the small city of Lyngdal. The loss of feminine gender is thus not a big city phenomenon, and our data reject H3. We have to keep in mind, though, that Lyngdal still has around 10,000 inhabitants, and is not considered very small by Norwegian standards. In order to reach enough participants, we did not include very small places in our study.

6.2 Indefinite determiner versus definite suffix

The results from this study show a clear difference between the indefinite determiner (Sect. 5.1) and the definite suffix (Sect. 5.2). While there is a massive decline in the use of the feminine indefinite determiner *ei* , the definite suffix *-a* (or its dialectal realizations) is used in a rather stable way. This pattern has previously been documented in Oslo, Tromsø, and Trondheim (see references above), and our data show that this pattern of change is more widespread, confirming H4. In the locations and age groups where the feminine gender is disappearing, the system in (2) is found, with two indefinite determiners (*en, et*) and three definite suffixes (*-en, -A, -et*).

(2) a. *en hest – hest-en* 'a horse – the horse'
b. *en dør – dør-A* 'a door – the door'
c. *et hus – hus-et* 'a house – the house'

One of the locations does not conform to this pattern. In Stavanger, we observe a change in the definite suffix as well as in the indefinite determiner. Here, the suffix *-A* is disappearing, and speakers frequently produced *dør-en* instead of *dør-A*. The adults in Stavanger use the *A*-suffix more than the high-schoolers and children. This system, without the *A*-suffix, has been used in the city dialect of Bergen and in Danish for several centuries.

This raises the question of why Stavanger is different from the other locations and is losing the *A*-suffix. Traditionally, there were two dialects spoken in the city: one variety spoken by the upper middle class, and another variety spoken by the lower class (cf. footnote 3 above). The upper middle-class dialect was strongly influenced by Danish and has a two-gender system in both indefinite determiners and definite suffixes. Although this variant has been found to be disappearing already in the 1980s (Gabrielsen 1984), some of our adult participants refer to it in their questionnaire and recall learning it during their childhood. The presence of this high variety may have influenced the loss of the *A*-suffix in Stavanger. At the same time, however, the split-dialect situation is not unique to Stavanger's history. A similar situation was present in Oslo and Trondheim, but here we see that the definite suffix *-A* is kept. This suggests that the upper middle-class variety may not be the (only) explanation for the findings in Stavanger. However, the difference in morphological richness between the two varieties was larger in Stavanger than in the other cities, which may have played a role. We return to the role of morphological richness in the next section.

Two recent studies on the Stavanger dialect, which also investigate feminine gender, suggest that the dialect in Stavanger is influenced by the 'standard spoken variety' and by written Bokmål (Johannessen 2020; Sandve 2022). These are indeed plausible influencing factors, but it is unclear why they would affect the local dialect in Stavanger more than in Trondheim or Kristiansand, for example. Johannessen (2020) investigated middle school students (age 15–16) and adults (age 40–55). Interestingly, she observes differences between the two neighborhoods of Stavanger

where the participants live. The definite suffix is one of the variables where such differences are found (Johannessen 2020, 80). The children and high school students in our study went to school in a central, high-prestige, and high-income neighborhood of Stavanger. This may have influenced the results, and we could potentially have found more frequent use of the *A*-suffix if we had tested participants from other areas of the city. Finally, as mentioned, the system in Stavanger without the *A*-suffix is also found in Bergen, the big city on the West coast and a potential source for dialect contact or regionalization. However, preliminary results from the sociolinguistic data do not include any mentioning of Bergen as a prestige or contact location and it is thus unclear if and how much the Bergen dialect has influenced the Stavanger dialect.

As pointed out in Sect. 2, the status of the Norwegian definite suffix is debated. On the one hand, its form appears to be related to gender—especially in three gender dialects with a one-to-one correlation between gender and declension. On the other hand, the definite suffix does not behave like other gender marking morphemes (e.g., the indefinite determiner). This has been attested in first language acquisition (Rodina and Westergaard 2013), heritage language (Johannessen and Larsson 2015; Lohndal and Westergaard 2016) and in the ongoing loss of feminine forms in Norwegian dialects (Rodina and Westergaard 2015; Busterud et al. 2019), also confirmed in this paper. In general, the definite suffix is acquired earlier, and its feminine form is retained to a larger degree by speakers and language varieties where other feminine gender markers are lost.

According to Hockett (1958, 231), gender is "reflected in the behavior of associated words". According to Rodina and Westergaard (2015), this definition rules out the definite suffix as a gender marker. They argue that the definite suffix is a declension class marker and that the distinction between gender and declension is clear from the empirical data in their paper. According to Svenonius (2017), on the other hand, the "behavior of associated words" is only a requirement to stipulate the existence of a given gender—not an exclusive description of which elements might express gender. He argues that the feminine definite suffix may express gender in dialects that clearly show feminine agreement also in other "associated" elements, in the same way that he claims the definite ending on neuter nouns expresses neuter gender. However, the ending alone is not enough to substantiate a syntactic gender distinction. Speakers that have retained the feminine definite suffix, but not other feminine markers, will therefore reanalyze the suffix as a declension class marker, and it will no longer be a feminine gender exponent in these varieties.

Our results show, like earlier research (Rodina and Westergaard 2015; Busterud et al. 2019), that the feminine indefinite determiner *ei* is typically lost (but at different rates in different locations), while the feminine definite suffix *-A* is typically retained. The data from Stavanger shows that the definite suffix is not immune to change, although it is kept to a larger degree than the feminine determiner. The two elements seem to behave differently, but they are not completely independent of each other. This is also what Enger (2004) and Berg (2019) conclude when looking diachronically at the relationship between gender and declension, and Johannessen and Larsson (2015) argue along similar lines based on data from American Norwegian and Swedish. Hopefully, future studies will be

able to shed more light on the role of gender versus declension class when feminine forms are lost in Norwegian. By looking at other elements expressing gender or declension class (adjectives, prenominal possessives, plural markers) and comparing how they change, the theoretical distinction between gender and declension will hopefully be founded more convincingly in empirical facts.

6.3 Morphological and sociolinguistic factors

Previous studies have argued that the high level of syncretism between masculine and feminine forms plays a role in the loss of the feminine gender, but this is based on dialects that have a high level of syncretism (see Sect. 2). We asked the question whether dialects with more morphological distinctions between masculine and feminine show less change.

Our sample of locations includes two places with complex gender morphology, where there are many cues for the feminine as a separate category. These places are Mo i Rana and Egersund. In line with our hypothesis H2, we find a more stable use of the feminine determiner *ei* in these locations compared to the other places. However, we also observed what appears to be the start of a change in the youngest speakers in Egersund, even though Egersund has more morphological cues for feminine than Mo i Rana in the heuristic we used. We also see that *ei* is more stable in the adults in Bodø than in Trondheim and Kristiansand, although these three dialects have the same (low) amount of morphological richness. In other words, there is no clear one-to-one correspondence between the loss of feminine gender and the degree of syncretism between masculine and feminine.

Based on our heuristic, Stavanger also presents clear counterevidence to H2. In our heuristic, we considered Stavanger as morphologically rich, based on the traditional lower-class dialect. However, as pointed out above, an upper middle-class dialect has also been present in Stavanger, which has no feminine gender (hence complete syncretism with the masculine). In addition, recent studies of the Stavanger dialect indicate that some of the morphological cues for feminine gender are disappearing (Johannessen 2020; Sandve 2022). It is in other words unclear how much morphological richness the Stavanger dialect has.

Our main hypothesis (H), however, is that the loss of the feminine gender is explained by an *interplay* between morphological and sociolinguistic factors. We hypothesize that the change has started in Oslo and is spreading from there through contact. It has been documented that features from Standard East Norwegian (which is very close to the written Bokmål standard) are spreading to several large cities in Norway (Hårstad 2010 and references therein). Previous research on grammatical gender in Norwegian has also highlighted the role of Standard East Norwegian in accounting for the decline of feminine gender. The spreading of urban vernacular features has often been argued to follow a pattern of 'urban jumping' in which they spread from a large city to a smaller city and from there to smaller cities again (cf. Trudgill 1974, 1983; Taeldeman 2005; Vandekerckhove 2009). Busterud et al. (2019) argue that the loss of feminine *ei* in Trondheim and Tromsø follows this pattern, and that the change has come further in Trondheim because it spread to Trondheim before it 'jumped' to Tromsø.[14]

The data presented in this study align with the model of urban jumping. If we adopt the grammatical analysis by Lohndal and Westergaard (2021) for Norwegian, we can argue that the grammatical gender feature 'common' is spreading and thereby eliminating the grammatical gender feature 'feminine'. Put differently, the grammatical gender feature system is reconfigured as a result of this change, and it becomes very similar to that of Standard East Norwegian (and thereby also the written standard Bokmål).[15] In addition, we have seen that the loss of feminine gender has not only spread to larger cities (Kristiansand, Stavanger), but is also spreading further to medium-sized and small cities (Bodø and Lyngdal). However, Egersund is less affected by this, and Mo i Rana seems only to be affected to a small extent in the youngest participant group. Both are medium-sized cities, and we would expect them to be affected through urban jumping before small cities like Lyngdal are affected. This turns out not to be the case and we speculate that the richness of the gender morphology in these locations is a factor in slowing down the change. The data from Egersund show, however, that morphological richness is not enough to prevent the change completely. The fact that Mo i Rana is affected even less by the change is likely due to its distance to Oslo and the other urban centers around it. Mo i Rana is, in other words, more isolated, which likely 'protects' against the loss of feminine gender together with the morphological richness of the dialect. It will be interesting to investigate the future developments of the feminine gender in Mo i Rana, to see whether it will eventually disappear here too, as in Egersund.

An interesting question that emerges from these data, is what they tell us about our understanding of language change, both regarding gender and more generally. We believe that additional data collected our project on grammatical gender in Norwegian dialects are required in order to be able to illuminate this question adequately and we therefore we cannot fully do justice to the question in this paper. However, we would like to point to three interesting aspects. One is that the model of urban jumping is too coarse-grained as it is not sufficient to account for all the patterns in our data. Much sociolinguistic literature has also criticized the model; see Britain (2013) for an extensive discussion. The second aspect is that in processes of language change morphology seems to matter, but only to a certain extent. As argued in the previous paragraph, mobility (see Britain 2013) or the lack thereof arguably plays a crucial role alongside morphology, but if there is a lot of mobility, morphology does not offer enough protection against change (again, compare the results for Egersund versus Mo i Rana). The last aspect is that the change is happening extremely fast. This is unlike many other processes of language change

[14] As an anonymous reviewer correctly notes, it may be that the influence of Standard East Norwegian varies between locations, speakers and situations. For instance, it is well known that some speakers are more attuned towards the 'standard' variety, and we have no way of objectively 'measuring' that in the present study. However, the sociolinguistic part of the project has data that can speak to this issue, and by studying those data we will hopefully be able to understand the nature dialect contact better.

[15] As we have seen, some groups are in the middle of undergoing a change. For these speakers, where there is quite a bit of variability, it makes sense to postulate two grammatical gender feature systems, where one aligns with Standard East Norwegian and the other one corresponds to the more typical dialect in question.

which often are rather slow. Previous investigations of changing gender systems have been based on written sources (with their complex relationship to the spoken language at the time), and our understanding of how grammatical gender changes may be altered by our ability to now study the change in grammatical gender in real time and through spoken language.

Summarizing, we propose that the loss of the feminine gender in Norwegian happens through a process of urban jumping and dialect contact, but that the morphological richness of the local dialect may slow down this change. If the dialect has more distinctions between masculine and feminine, the loss of the feminine may happen later or slower. The combination of the factors *contact* and *morphological richness* explains the patterns found in the different cities we investigated.

7 Conclusion

In this paper we have investigated the loss of feminine gender across Norwegian dialects. By comparing 2–3 age groups in seven places, we have seen that the use of feminine forms differs considerably between dialects, but that younger participants use less feminine forms than older participants in general. The results are consistent with previous findings (Lødrup 2011; Rodina and Westergaard 2015; Svenonius 2017; Busterud et al. 2019) in that the indefinite determiner *ei* is replaced by the masculine form *en* by most of the younger speakers, while the feminine definite suffix is generally retained. This pattern, which has earlier been attested in big cities only, was found in most of the places in this study, showing that it is not a big city phenomenon. There are however differences between the places, as feminine forms are lost at a different rate and to a different degree. It seems that there is a cline: At one end we find Mo i Rana, where feminine gender seems to be very robust, even among the children. At the other end of the cline, we find Stavanger, where feminine forms are vulnerable across all age groups. Stavanger is particularly interesting because the feminine definite suffix is disappearing as well as the indefinite determiner.

We have investigated how different factors may influence the use of feminine gender in different dialects and age groups. Our main hypothesis was that it is governed by a combination of language internal factors (richness of gender morphology, or number of feminine gender cues) and language external factors (number of inhabitants, or degree of linguistic contact). These factors are difficult to tease apart, mainly because city size and morphological richness tend to go together. Additionally, other factors, such as local patriotism, influence from written language, attitudes towards different Norwegian varieties, etc., may play in and make the picture even more intricate. Still, we have shown results supporting our hypothesis: the gender change is spreading through a pattern of urban jumping, while higher morphological gender richness (Mo i Rana and Egersund) seems to make the feminine forms less vulnerable, thereby slowing down the process. Further research is needed in order to better understand how the different factors interact. This would require a more systematic investigation of sociolinguistic data than was

included in this paper. It will also be relevant to look at how other linguistic elements behave in terms of gender. Distinct feminine forms are found, at least in some Norwegian dialects, in possessives, adjectives, plural suffixes, and anaphoric pronouns. By comparing different parts of the gender system, both within and across individuals and dialectal varieties, we could find out more about the nature of the change. This will also help us understand how grammatical categories like gender are conceptualized.

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Declarations

Ethics approval and consent to participate The studies were conducted in accordance with the Declaration of Helsinki. We obtained a written confirmation from the Norwegian Centre for Research Data (NSD) that the data would be handled in accordance with GDPR and Norwegian regulations. All participants or their legal guardians signed a written consent form prior to participating.

Competing interests The authors declare that they have no competing interests.

Appendix 1: List of nouns

The Table 17 includes all nouns depicted in the elicitation task, in the order of appearance.

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Table 17 All nouns elicited in the task.

#	Item type	Item	Translation	Gender
1	practice item	fisk	fish	M
2	practice item	såpe	soap	F
3	practice item	fly	plane	N
1	test item	traktor	tractor	M
2	test item	vogn	cart	F
3	test item	klokke	clock	F
4	test item	slange	snake	M
5	test item	eple	apple	N
6	test item	dør	door	F
7	test item	hjerte	heart	N
8	test item	mus	mouse	F
9	test item	øye	eye	N
10	test item	menneske	human	N
11	test item	hest	horse	M
12	test item	ekorn	squirrel	N
13	test item	kake	cake	F
14	test item	sol	sun	F
15	test item	hus	house	N
16	test item	geit	goat	F
17	test item	saks	scissors [sg]	F
18	test item	kopp	mug	M
19	test item	pil	arrow	F
20	test item	stige	ladder	M
21	test item	bein	bone	N
22	test item	lue	beanie	F
23	test item	seng	bed	F
24	test item	måne	moon	M
25	test item	kjole	dress	M
26	test item	stjerne	star	F
27	test item	flaske	bottle	F
78	test item	bord	table	N
29	test item	bukse	pants [sg]	F
30	test item	bøtte	bucket	F
31	test item	frosk	frog	M
32	test item	krone	crown	F

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