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The decline of feminine possessives in Norwegian: An empirical and theoretical investigation of gender and declension class

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This paper reports results from a large cross-dialectal study, showing that feminine forms are changing in several dialects. These results suggest that the Norwegian three-gender system may be in the process of becoming a two-gender system. By using a more extensive battery of experimental tests than previous studies, we are able to scrutinize the nature of grammatical gender with substantial empirical coverage. The data consists of pre- and postnominal gender forms elicited from 345 participants across seven dialects: indefinite articles and definite suffixes already reported in van Baal et al. (in press), and pre- and postnominal possessive forms that constitute novel data from the same participants. The paper concludes that the feminine indefinite article and the feminine prenominal possessives are vulnerable across all the investigated dialects, but to different extents. Comparing how individuals combine these two forms with the feminine definite suffix and the feminine postnominal possessives, it is clear that the postnominal forms are i) retained by most speakers, and ii) only vulnerable in speakers who have also lost the feminine/masculine distinction on the prenominal elements. The paper argues that this data supports the formal analysis of Svenonius (2017), which claims that feminine gender can be reanalyzed as a declension class, allowing the feminine definite suffix to be retained, together with a phonologically conditioned feminine postnominal possessive.

1 Introduction

Recent research has shown that the grammatical gender system in Norwegian is undergoing a change: The traditional three-gender system is changing into a two-gender system in several dialects (Rodina & Westergaard 2015; 2021; Busterud & Lohndal & Rodina & Westergaard 2019; van Baal & Solbakken & Eik & Lohndal 2023). However, a more extensive cross-dialectal investigation has not emerged until very recently. Van Baal & Eik & Solbakken & Lohndal (in press) investigate the indefinite determiner and the suffixed definite marker in the elicited production of 347 participants across seven locations in Norway. They find clear differences between these locations, demonstrating that some dialects have kept a three-gender system, whereas most of the dialects investigated are undergoing a change towards a two-gender system. This study considers indefinite determiners and definite suffixes, but no other markers of grammatical gender.

In the present paper, we investigate prenominal and postnominal possessives in Norwegian. These two syntactic patterns are illustrated in (1) for a feminine noun.

(1) a. *mi* *bok*
my.F book
'my book'

b. *bok-a* *mi*
book-DEF.F my.F
'my book'

While the two patterns have the same meaning, the postnominal pattern has been identified as the 'neutral' pattern, whereas the prenominal pattern is often used for 'contrast' (Anderssen & Westergaard 2010). The goal of this paper is to study the status of feminine grammatical gender by comparing determiners and possessives elicited from the same participants in the seven locations investigated in van Baal et al. (in press). This will enable us to address the question of whether these gender markers change at the same time and in the same way. Our findings suggest that both indefinite determiners and prenominal possessives are vulnerable in all locations, but to different degrees in different locations. In contrast, the definite suffix and postnominal possessives are generally retained in all groups, except in the dialect of Stavanger, where they are both vulnerable. We also present empirical data showing how individual speakers combine the different forms. Studying correlations between pre- and postnominal forms in 345 participants across seven dialects gives a unique window into how the gender change manifests at the individual level. Interestingly, we find a very clear pattern across participants and locations: Speakers who have maintained the prenominal distinction between feminine and masculine forms always maintain the postnominal distinction as well. However, when the prenominal forms are lost, the postnominal forms seem to become more vulnerable, although

they are not necessarily lost. Theoretically, we argue that our findings support Svenonius' (2017) claim that the definite suffix changes from a feminine gender marker to a declension class marker when the feminine gender feature is lost.

This paper is organized as follows. Section 2 provides relevant background regarding grammatical gender and possessives in Norwegian dialects. Our research questions are presented in Section 3, and our methodology is outlined in Section 4. Section 5 provides an overview of all the results, whereas Section 6 discusses the results in view of the research questions. Section 7 concludes the paper.

2 Background

2.1 Grammatical gender in Norwegian

Grammatical genders are usually defined as "classes of nouns reflected in the behavior of associated words" (Hockett 1958: 231; see also Corbett 1991: 1). In Norwegian, gender is expressed on DP-internal elements (adjectives, indefinite articles, demonstratives, possessives), anaphoric pronouns, and predicative elements (adjectives and possessives). **Table 1** shows an idealized paradigm of singular gender forms for Norwegian based on the written varieties Nynorsk and Bokmål.

	Masculine	**Feminine**	**Neuter**
Indefinite article	**e(i)n** hest *a horse*	**ei** seng *a bed*	**e(i)t** hus *a house*
Definite article	hest**en** *horse.DEF*	seng**a** *bed.DEF*	hus**et** *house.DEF*
Adjective	e(i)n **brun** hest *a brown horse*	ei **brun** seng *a brown bed*	e(i)t **brunt** hus *a brown house*
Demonstrative	**den** brune hesten *the brown horse.DEF*	**den** brune senga *the brown bed.DEF*	**det** brune huset *the brown house.DEF*
Prenominal possessive	**min** hest *my horse*	**mi** seng *my bed*	**mitt** hus *my house*
Postnominal possessive	hesten **min** *my horse*	senga **mi** *my bed*	huset **mitt** *my house*

Table 1: Gender agreement in Norwegian.[1]

[1] The paradigm for possessives is illustrated using the first person form *mi*. Note that second person *di* and reflexive *si* behave the same way. The syncretism between masculine and feminine adjectives extends to nearly all lexical items, excluding a very small class of adjectives ending in *-en*, which has separate feminine forms in many dialects.

The distinction between feminine and masculine gender is optional in the written language Bokmål and some spoken varieties (see Section 2.3). Other dialects have additional distinctions between feminine and masculine gender on definite (weak) adjectives, plural suffixes, and the indefinite form of weak nouns. The definite suffixes and the postnominal possessives are included in the table to show that they differ in form between the three genders, although they are often not considered true exponents of gender (see Section 2.4). As we can see from **Table 1**, there are several instances of syncretism between masculine and feminine forms, while the neuter forms are always distinct. In Old Norse, there were separate feminine forms for indefinite adjectives and demonstratives as well, but they have disappeared over the centuries. This has resulted in a paradigm with few unambiguously feminine gender cues, making the distinction between masculine and feminine gender less salient than the one between neuter and non-neuter.

2.2 Possessives

This paper is concerned with the possessive determiners *min* 'my' and *din* 'your', henceforth referred to simply as *possessives*. As seen in **Table 2**, both forms, as well as the reflexive possessive *sin,* are inflected for number and gender in Norwegian.

	1st person	**2nd person**	**Reflexive**
Masculine	min	din	sin
Feminine	mi	di	si
Neuter	mitt	ditt	sitt
Plural (all genders)	mine	dine	sine

Table 2: Declension paradigm for Norwegian possessives.

In all varieties of Norwegian, the possessives can be either prenominal or postnominal. The postnominal construction (2a) is considered pragmatically neutral, while the prenominal one (2b) is often used in conditions of contrast or emphasis (Anderssen & Westergaard 2010: 2578). In a corpus of child language recorded in Tromsø, Anderssen and Westergaard find that the adult speakers use the postnominal possessive in 75% of the possessive constructions (ibid.: 2581). However, in the spoken language, the postnominal construction can also be stressed to give a contrastive reading, as in (2d).[2] This makes it challenging to elicit the two phrase types, as will be discussed in Section 4.3. Finally, possessives can also be predicative in Norwegian, as shown in (2e), but this construction is beyond the scope of this paper. The examples in (2) show how possessives are inflected relative to the masculine noun *kopp* 'mug'.

[2] The possessive forms in bold are stressed.

(2) a. *Har du sett den nye koppen min?*
Have you seen the new mug DEF.M my.M
'Have you seen my new mug?'

b. *Har du sett min nye kopp?*
Have you seen my.M new.DEF mug
'Have you seen my new mug?'

c. ***Din** kopp er nyere.*
Your.M mug is newer
'YOUR mug is newer'

d. *Koppen **din** er nyere.*
Mug.DEF.M your.M is newer
'YOUR mug is newer'

e. *Koppen er min.*
Mug.DEF.M is my.M
'The mug is mine'

2.3 Loss of feminine gender forms

Although the Norwegian three-gender system has been considered fairly stable, the use of historically masculine forms with traditionally feminine nouns is not a novelty. Starting with the dominant written language Bokmål, feminine gender is optional and often omitted. This contrasts with the other written language Nynorsk, where feminine gender is required. When it comes to spoken varieties, Fretheim (1985) shows that in the Eastern Norwegian dialects that are most similar to Bokmål, the feminine indefinite article and prenominal possessives are replaced by masculine forms, illustrated in (3a) and (3c).[3] While the feminine forms are typically retained postnominally (definite article and postnominal possessives), illustrated in (3b) and (3d), this system also allows masculine forms instead. The noun *bok* 'book' in (3) is traditionally feminine.

(3) a. ***ei/en** bok*
a.F/a.M book
'a book'

b. *bok**a/en***
book.DEF.F/DEF.M
'the book'

c. ***mi/min** bok*
my.F/my.M book
'my book'

[3] The Bergen dialect lost feminine gender centuries ago, but this was a different process than the one discussed here (see Nesse 2002).

d. *bok**a*** ***mi/*** *bok**en*** ***min***
book.DEF.F my.F/ book.DEF.M my.M
'my book'

In a corpus of speakers from Oslo, Lødrup (2011) finds that the use of prenominal feminine forms (indefinite article, prenominal possessives, adjectives) is generally low, while the postnominal definite marker *-a* is widely used. In total, 29% of the speakers produce at least one feminine prenominal form, but only half of these 29% produce more than one. Lødrup (2011) concludes that age is the best predictor for the use of feminine gender, where older participants tend to produce more (prenominal) feminine forms.

During the last decade, the system described by Fretheim (1985) and Lødrup (2011) has also been found in the dialects of Tromsø (Rodina & Westergaard 2015) and Trondheim (Busterud et al. 2019). Both studies use elicited production tasks to study the use of feminine indefinite determiners and definite suffixes in different age groups, and they find the same asymmetry among younger speakers in both cities: The indefinite article *ei* is generally replaced by *en* by younger speakers, while the definite suffix *-a* is retained for most of them. The change seems to have advanced further in Trondheim than in Tromsø: While 14/15 adult participants in Tromsø use the feminine indefinite article consistently, this applies only to one of the adult Trondheim participants, and more than 50% of them never use *ei*. In order to find out if the change also applies to other Norwegian dialects, especially those in smaller places and those with morphologically richer gender systems, van Baal et al. (in press) have conducted similar studies in Bodø, Mo i Rana, Stavanger, Egersund, Lyngdal, Kristiansand, and Trondheim. They find that the loss of feminine gender forms is a general tendency, but that the pace of the change differs from place to place. In some places, feminine forms are lost by most speakers in all age groups, while in other places, only (some of) the younger participants do not use the feminine forms. The authors interpret this as the beginning of a change where the end result may be a complete loss of feminine gender. Moreover, they hypothesize that the change is enabled by grammatical syncretism between masculine and feminine forms, but that the process is driven by sociolinguistic factors (see also Rodina & Westergaard 2015; Busterud et al. 2019).

As shown in **Table 1**, there are few distinct feminine forms in most Norwegian dialects. Both Fretheim (1985) and Lødrup (2011) report a correlation between the use of the indefinite article form *ei* and the prenominal possessive forms *mi/di/si*. That is, speakers who say *ei bok* 'a.F book' are likely to also say *mi bok* 'my.F book'. Similarly, the use of the definite article *-a* is correlated with the use of postnominal *mi/di/si*, so that speakers using the form *boka* 'book.DEF.F' will also say *boka mi* 'book.DEF.F my.F, my book'. As will be discussed in Section 2.4, the status of the postnominal forms as exponents of gender is disputed. Therefore, earlier studies have focused on prenominal forms. As a follow-up of the Tromsø study mentioned above (Rodina & Westergaard

2015), the same authors investigated the use of prenominal possessive forms in Tromsø (Rodina & Westergaard 2021). For most groups, they find that there is no significant difference between the use of *ei* and prenominal *mi*. Both forms are generally used more by the adult participants than the younger speakers. Most adult speakers use both feminine forms consistently, while most speakers in the groups of children and adolescents mainly use the masculine forms, *en* and prenominal *min*. As in previous studies, they find an asymmetry between pre- and postnominal forms, as all groups use both *-a* and postnominal *mi* with more than 85% of all traditionally feminine nouns.

2.4 Gender vs. declension class

As seen from the previous research in Section 2.3, the new gender paradigm is asymmetrical in that the prenominal feminine forms (*ei* and *mi/di/si*) are disappearing, while the postnominal forms (*-a* and *mi/di/si*) are retained. It has been argued that this is because the elements have a different syntactic status (Rodina & Westergaard 2015; 2021; Busterud et al. 2019; Lohndal & Westergaard 2016; 2021). In what follows, we discuss this in more detail.

2.4.1 The prenominal forms *ei* and *mi*

The indefinite article *ei* and the prenominal possessive *mi/di/si* agree with the head noun in gender and number. Although they often appear directly before the noun, as in (4a) and (4b), they can also be separated from the noun by other elements, like in (4c) and (4d). This shows that they are free morphemes, and that their forms are triggered by syntactic agreement.

(4) a. *et* *tre*
a.N tree
'a tree'

b. *mitt* *tre*
my.N tree
'my tree'

c. *et* *stort* *tre*
a.N big.N tree
'a big tree'

d. *mitt* *altfor* *høye* *grønne* *tre*
my.N way-too tall.N green.N tree
'my way too tall green tree'

We see in (4) that the elements in question have a neuter form when modifying a neuter noun. In traditional three-gender dialects, this type of agreement is also found with feminine and masculine forms:

(5) a. *ei jente*
a.F girl
'a girl'

b. *en gutt*
a.M boy
'a boy'

c. *mi store bok*
my.F big.DEF book
'my big book'

d. *min grønne stol*
my.M green.DEF chair
'my green chair'

As was shown in 2.3, this distinction is lost for many speakers, giving the following forms:

(6) a. *en jente*
a.C girl
'a girl'

b. *min store bok*
my.C big.DEF book
'my big book'

This could mean one of two things: i) feminine gender is lost, ii) feminine and masculine forms have merged and become syncretic. The first analysis entails that when the feminine forms *ei* and *mi/di/si* disappear, as seen in speakers in Oslo, Trondheim and Tromsø, the underlying distinction between masculine and feminine gender is lost. The traditionally feminine nouns may still constitute a separate declension class distinct from the traditional masculine nouns, but there is no gender distinction between the two classes. Following the second analysis, one would assume that the loss of *ei* and *mi/di/si* is only a continuation of an ongoing process where the feminine and masculine forms are merged, but that the underlying syntactic distinction between the two genders is still maintained. For the latter analysis to work, there needs to be some other overt distinction between feminine and masculine nouns. We saw in Section 2.3 that most of the speakers in question have retained the feminine definite suffix and the feminine postnominal possessive. In the two following sections, we look at these two elements and discuss whether they should be considered exponents of gender. The realization of the feminine definite suffix varies between dialects and can be pronounced as /a/, /o/, /u/, or /e/ (the latter only on strong feminine nouns in some dialects) (Sandvik 1979: 98). As this variation is not relevant for the current study, we will use the notation *-A,* which includes all allomorphs of the feminine definite singular morpheme.

2.4.2 The definite marker *-A*

Whereas the indefinite articles and the prenominal possessives are clear markers of grammatical gender, the status of the definite suffix is less clear. According to Hockett's (1958: 231) definition, the definite suffix does not reflect the gender of the noun, as it cannot be defined as an "associated word". The distinction between gender on targets like adjectives and determiners on the one hand and declension on the noun itself on the other is an important one cross-linguistically, as we need to be able to account for systems where the number of declension classes exceeds the number of genders and systems where one suffix is used on nouns of different genders. Following Hockett's (1958) definition, Rodina & Westergaard (2021: 239–240) argue that the form of the definite suffix is determined by declension class rather than gender. They emphasize that the indefinite article and the definite suffix behave differently both in terms of acquisition and change (cf. Rodina & Westergaard 2013; 2015; Lohndal & Westergaard 2016; 2021; Busterud et al. 2019).

There is clearly a difference between the indefinite article and the definite suffix both in when they are acquired and how they behave regarding the change in feminine gender, but does that necessarily mean that one is a gender marker, and the other one is not? As shown in **Table 1** above, there is, in many Norwegian dialects, a one-to-one mapping between gender and definite suffix form. This is because the definite article used to be a free, agreeing morpheme which was later cliticized to the noun (Faarlund 2009). As there is indisputably a tight relation between gender and declension in Norwegian, the declensional endings have traditionally been considered exponents of gender (cf. Faarlund & Lie & Vannebo 1997: 150). Dahl (2000: 583–584) attempts to combine this tradition with Hockett's (1958: 231) definition of genders as "classes of nouns reflected in the behavior of associated words". By substituting "words" with "morphemes", he claims "there seems to be no obstacle to treating *some* inflectional distinctions as gender" (Dahl 2000: 584, our emphasis). The problem with this proposal, as Lødrup (2011: 22–23) points out, is that it is not clear why some inflectional endings, like the definite suffixes, should be gender exponents, and other endings, like plural suffixes, should not. That being said, Enger (2004: 65) deems it "perverse to deny that the definite singular suffix is an exponent of gender, when there is one and only one definite singular suffix associated with each gender" and concludes that "it would be unwise to claim that the definite singular suffix is exclusively an exponent of declension and not at all of gender if the only argument is a controversial definition of «gender»".

Returning to the question of feminine gender and the loss of feminine forms, the issue at stake is the status of the feminine definite suffix *-A*, which is used also by speakers who do not use feminine forms like *ei* and prenominal *mi.* In other words, we see the emergence of a system where there is no longer a one-to-one mapping between gender and suffixal forms. Is the *-A* suffix an exponent of gender (cf. Faarlund et al. 1997; Dahl 2000) or does it merely distinguish one declension class (traditionally feminine words) from other declension classes (cf. Rodina & Westergaard 2015; 2021)? Enger (2004: 65) concludes that gender distinctions should be

based on agreement relations (cf. Hockett's definition), but he also argues that affix distinctions which correspond to the distinctions on associated words should be considered gender markers. Following Enger's reasoning, the *-A* suffix should be considered a marker of feminine gender in systems which also distinguish between feminine and masculine gender on associated words, but *-A* on its own is not enough to stipulate feminine gender in a system which does not mark feminine gender on associated words.

Enger's proposal can be considered a nuanced version of Hockett's gender definition. He does not go as far as Dahl in considering all definite suffixes gender markers regardless of the gender distinctions found in other parts of the paradigm, but he argues clearly that the opposition between different definite suffixes can be considered gender distinctions. Svenonius (2017) formalizes this view and discusses this nuanced gender definition in view of the Norwegian microvariation between two- and three-gender systems. In Svenonius' analysis, the distinction between syntax and phonology is of great importance. He defines gender as a (pseudo)syntactic feature and declension class as a (pseudo)phonological feature. In a three-gender system where the three definite suffixes correspond to the three genders, he argues that the suffixal form is determined by gender only. If the neuter gender feature is present, the *-e* suffix will appear, if the masculine gender feature is present, *-en* will appear, and if the feminine gender feature is present, the *-a* suffix will appear. When the feminine feature is a syntactic gender feature (in three-gender dialects), it can also be accessed by syntactic operations like Agree, and this is what determines Hockett's (1958: 231) "behavior on associated words". In the hybrid systems outlined in Section 2.3, there is no longer a one-to-one mapping between the definite suffix and other gender forms. In these systems, Svenonius argues, feminine gender has been reanalyzed as a declension class. This entails the following: The definite suffix is still determined by gender features, but now there are only two such features: common and neuter gender. Neuter nouns will still get the *-e* suffix due to the neuter gender feature. Common gender nouns, however, can get either *-A* or *-en*. The *-A* suffix is retained on the traditionally feminine nouns, while feminine agreement on *associated words* is lost. Svenonius' analysis explains this as a loss of feminine gender and the emergence of a feminine declension class within the new common gender category. The traditionally feminine nouns will get a non-syntactic declension class feature, *F*, which gives the suffix form *-A* on these nouns. Syntactically, this suffix is governed by common gender, just like the *-en* suffix is.

Whereas Enger (2004) and Dahl (2000) are concerned with the obvious relation between gender and definite suffixes, Svenonius attempts to show that the definite form *-A can* be governed by a non-syntactic declension class feature, meaning that we do not *need* to stipulate the existence of feminine gender in systems where there is no feminine agreement on prenominal elements.

The different views can be placed on a continuum ranging from the *definite suffixes are never gender exponents*-view (see e.g. Rodina & Westergaard 2021) to the *definite suffixes should be included in the definition of gender*-view (see e.g. Dahl 2000). Between these two extremes, we find Enger (2004) and Svenonius (2017) who argue that definite suffixes should be considered gender exponents, but that they need to correspond to other, free gender markers. That is, the *-A* suffix can only be considered an exponent of *feminine* gender as long as there is also feminine gender marking on free morphemes. Ultimately, these different views may come down to a question of definition. We will, however, in Sections 5 and 6, present empirical data which show a clear relationship between gender and definite markers. We argue that it would be beneficial to adopt a definition of gender which takes this relationship into account. More specifically, we argue that our data support the formal analysis of Svenonius (2017).

2.4.3 The postnominal possessive *mi/di*

In the written language, the postnominal possessives are separated from the noun, just like the prenominal possessives. However, they differ from their prenominal counterparts in that they cannot be separated syntactically from the noun they modify.[4] The form of the postnominal possessives also seems to depend on the form of the definite suffix they follow. That is, no speakers seem to allow the combination of a feminine definite suffix and a masculine possessive (**jakka min* 'jacket.DEF.F my.M') nor a masculine definite suffix and a feminine possessive (**jakken mi* 'jacket.DEF.M my.F') – not even speakers who use the masculine and feminine forms interchangeably (Fretheim 1985; Rodina & Westergaard 2021). This indicates that the form of the postnominal possessive is governed by the definite suffix.

Svenonius (2017: 353–354) suggests that in two-gender dialects (i.e., dialects where the prenominal feminine forms are lost) "the series *mi, di, si* is conditioned by the phonological context of immediately following a vowel within a prosodic phrase". He emphasizes the distinction between syntax and phonology and claims that while the neuter possessive forms (*mitt, ditt, sitt*) are governed by a syntactic neuter gender feature, the feminine forms no longer correspond to an equivalent feminine gender feature in these systems. When the prenominal distinctions between feminine and masculine forms are lost, there is not enough evidence for stipulating a syntactic F/M gender distinction, giving a system consisting of two genders: neuter

[4] This is difficult to show explicitly, because very few elements can normally stand after a definite noun in a DP. However, example (i) from Lødrup (2011: 124) clearly shows that a speaker who does not have the prenominal F-M distinction, can only use the *mi* form directly after the definite suffix *-a.* This shows clearly that the mapping between *mi* and *-A* in these systems require adjacency.

(i) Hvis du ikke finner boka di, kan du låne min/ *mi
If you not find book.DEF.F your.F, can you borrow my.DEF.M/ *my.F
'If you cannot find your book, you can borrow mine'

and common gender. The postnominal possessives are governed by these gender features, just like they are in a three-gender system: *mitt* is used when the neuter feature is present and *min* when the common gender feature is present. The *mi* form, which is used when the feminine feature is present in a three-gender system, has become an allomorph of the *min* form in the two-gender systems. Both *mi* and *min* are governed by the common gender feature, but the *mi* form is only used in a specific phonological condition, i.e., following the vowel /a/[5]. The rule is stated in (7) (Svenonius 2017: 354):

(7) $\langle \text{POSS, 1SG} \rangle \Leftrightarrow \begin{cases} /\text{mi}/ \ / \ [_{\phi}/\text{a}/\_\_] \\ /\text{min}/ \end{cases}$

Other analyses of the feminine possessive forms in two-gender systems have been proposed. Some have claimed that the *mi/di/si* forms are suffixes attaching to the *-A* suffix (see Lødrup 2011; Trosterud 2001: 29; Conzett & Johansen & Sollid 2011: 52). The suffix analysis is, however, inconsistent in that it only considers the feminine forms, and not the masculine or neuter forms, as suffixes.

The question of what the postnominal possessives are is mainly a theoretical one. The empirical data from previous studies (Lødrup 2011; Rodina & Westergaard 2021) have shown a clear relationship between the definite suffix and the following possessive, and as we will see, the data in this study confirm that relationship. We will adopt Svenonius' (2017) analysis and consider the relationship between the -A suffix and the *mi* form a non-syntactic one, but this is not the crucial part of our discussion, which is more concerned with the mapping between different pre- and postnominal forms.

3 Research questions

Based on earlier research (Rodina & Westergaard 2021; Lødrup 2011; Svenonius 2017), there is good reason to believe that the change in feminine gender found in several dialects is reflected in the possessives as well. There is also reason to believe there will be an asymmetry for many speakers between the prenominal and postnominal possessive forms, with a correlation between the use of indefinite articles and prenominal possessives on the one hand and the form of the definite suffix and the postnominal possessive on the other. In this paper we investigate the following three research questions. They are followed by four hypotheses. For reasons discussed in Section 4.3, we will not distinguish between the first and second person forms of possessives (*min/mi/mitt* 'my' and *din/di/ditt* 'your'). The notations MIN, MI, and MITT will be used to refer to both first and second person forms.

[5] The rule in (7) is based on dialects where the feminine definite suffix ends with -a. The rule will have to be adapted in dialects where the vowel quality is different. There are dialects where both the neuter and the feminine suffix end with similar vowel qualities. However, this is not problematic for the analysis, given that the neuter gender feature will give the neuter possessive form.

RQ1 To what extent are the feminine possessive forms lost in Norwegian dialects?
RQ2 Are the two feminine prenominal forms (*mi* and *ei*) disappearing at the same time?
RQ3 What is the relationship between the prenominal feminine forms (*ei* and *mi*) and the postnominal forms traditionally used on feminine nouns (*-A* and *mi*)?

H1 The rate of the loss of feminine gender forms varies geographically.
H2 The loss of feminine gender forms started at different points in time in different dialects.
H3 The loss of the indefinite article *ei* and the prenominal possessive *mi* happen in parallel.
H4 The definite suffix *-A* and the postnominal possessive *mi* are retained across the investigated dialects.

RQ1 is mainly a question of the geographic spread of the ongoing change in feminine gender. We know from earlier research (Rodina & Westergaard 2015; Busterud et al. 2019; van Baal et al. in press) that the indefinite article *ei* is vulnerable across all dialects investigated, but that the process has gone considerably further in bigger places with less morphological richness compared to morphologically rich dialects in smaller places (van Baal et al. in press). This variation is also expected to apply to the use of feminine possessives, cf. H1 and H2.

We want to find out whether the change in feminine gender is one simultaneous process, or whether it happens through several stages. RQ2 and RQ3 are both concerned with the relationship between the different feminine forms. As discussed earlier, there seems to be a correlation between the two prenominal forms and between the two postnominal forms. Based on earlier research (Rodina & Westergaard 2015; 2021; Busterud et al. 2019) we expect the two prenominal forms to disappear in parallel, while we expect the two postnominal forms not to disappear (H3 and H4). We are also interested in how individual speakers combine the feminine prenominal forms and the feminine postnominal forms. In answering RQ3, we use our data to investigate the analysis of Svenonius (2017): He argues that the *-A* suffix is governed by a feminine gender feature in three-gender dialects, and that it is reanalyzed as a declension class marker in two-gender dialects.

4 Method

This study uses data from GenVAC; a large-scale cross-dialectal project employing a range of different methods to capture the nature of the change in grammatical gender in Norwegian (van Baal et al. 2023). The GenVAC data was collected between October 2021 and September 2022, and the data set contains data from a total of 347 participants, from 345 of which we have data on possessives. In the current paper, we have included data from two elicited production tasks, which are presented in Section 4.3. The methodology of the GenVAC project is discussed in detail in van Baal et al. (2023; in press). The experimental stimuli and the datasets are available in TROLLing (Lohndal & van Baal & Eik & Solbakken 2023).

4.1 Selection of places

The GenVAC data is collected from speakers of seven different dialects. The locations were chosen based on language-internal factors (the morphological richness of the gender systems of the traditional dialect) and language-external factors (the number of inhabitants, commuting patterns, etc.). The project's main hypothesis is that the change in grammatical gender is the result of an interplay between these factors (van Baal et al. 2023).

Some linguistic changes tend to spread to bigger cities first, and then spread out locally to smaller places. This is known as *urban jumping* (Chambers & Trudgill 1980; Sandøy 1998). Busterud et al. (2019) argue that this model is applicable to describe the loss of feminine gender in Norwegian. In order to investigate this, the locations were selected in pairs, so that there were one bigger and one smaller place from each part of the country.[6] The richness of gender morphology was measured with a metric developed specifically for the project. The metric consists of a list of six possible distinctions between masculine and feminine gender in different parts of the nominal paradigm (see van Baal et al. 2023 for a detailed description). The hypothesis is that a dialect with many distinctions (i.e., many gender cues) will retain feminine gender better than one with fewer distinctions. **Table 3** shows the size and number of feminine cues of each of the seven places; see van Baal et al. (2023) for an in-depth discussion of the various cues and a description of how the number of cues was established for each location.

	Cities	**Inhabitants**	**Feminine cues**
Northern Norway	Bodø	52 024	2/6
	Mo i Rana	26 315	4/6
Central Norway	Trondheim	202 235	2/6
South-western Norway	Stavanger	142 034	5/6
	Egersund	14 830	6/6
Southern Norway	Kristiansand	110 390	2/6
	Lyngdal	10 389	3/6

Table 3: Size and morphological richness of the seven places/dialects investigated in GenVAC.[7]

[6] Due to restrictions following the Covid 19 pandemic, the data collection was delayed, and some cuts in the original plan had to be made. This plan included three more places – two in Eastern Norway and one more in Central Norway.

[7] All the data was collected in the city centers, with speakers living in the central areas. The number of inhabitants is based on the entire municipality (Statistics Norway 2019).

4.2 Participants

The study includes two or three age groups in each place. Group B (17–19 years) and group C (25+ years) are included in all seven places. In addition, a group A (10–12 years) is included in three of the places. Originally, a minimum of 20 participants were recruited for each group. The criteria were that they had to have grown up in the area and were native speakers of Norwegian. A few participants did not consistently distinguish between neuter and non-neuter gender. As we did not have sufficient data to investigate the lack of neuter (there were indeed few cases), and as we consider this variation to be unrelated to the change in feminine gender, the participants with less than 50% target-like production of indefinite neuter determiners were excluded from the study. The number of participants after exclusion is listed in **Table 4**.

	A (primary school pupils)		**B (high school students)**		**C (adults)**	
	N of participants	**Age**	**N of participants**	**Age**	**N of participants**	**Age (mean)**
Bodø	–	–	20	18–19	21	26–71 (51.45)
Mo i Rana	18	11	19	18–19	18	29–71 (52.27)
Trondheim	–	–	18	18–19	24	25–68 (40.67)
Stavanger	19	12–13	20 (21 in task 1)	17–19	25	25–75 (51.16)
Egersund	20	13	21	17–19	23 (24 in task 1)	29–71 (48.83)
Kristiansand	–	–	19	18	22	30–78 (55.68)
Lyngdal	–	–	19	17–19	19 (18 in task 1)	30–88 (57.79)
Total	**57**	**11–13**	**136**	**17–19**	**152**	**25–88 (50.80)**

Table 4: Number and age of participants.[8]

[8] The table reports the number and age of the participants who completed the possessive task (task 3). In each of the groups Stavanger-B and Egersund-C there was one additional participant who completed task 1 (determiners and suffixes), but not task 3. One of the participants in Lyngdal-C did not complete task 1 but is included in the table as they did complete task 3.

4.3 Elicitation tasks design and procedure

The data reported in this study was collected as part of a large test battery, including four picture-aided elicited production tasks. In this paper, we report the results from two of these tasks. All participants started with the determiner task (task 1). They then completed a task eliciting plural noun forms before doing the possessives task (task 3 in the GenVAC set of experiments, hence we have retained that label here).

Task 1 is based on the design used by Rodina & Westergaard (2015). The participants see a screen with two objects only differing in color. They are asked to describe what they see on the screen, and the target response consists of two nominal phrases, each including an indefinite article, an attributive adjective, and a noun (e.g., *ei gul kake* 'a yellow cake'). Next, one of the objects disappears from the screen, and the participants are asked what happened. This elicits a definite nominal phrase, consisting of a determiner, a definite attributive adjective, and a noun with a definite suffix (e.g., *den gule kaka* 'the yellow cake'). The procedure is repeated with 36 nouns – 8 masculine, 8 neuter, 16 feminine, half of them weak and half of them strong. Weak nouns end with an unstressed vowel (e.g., *kake* 'cake'), while strong nouns end with a consonant (e.g., *seng* 'bed'). The selection of nouns was based on earlier research, with some changes. The main criterion was that the noun was depictable in a clear and unambiguous way. We also aimed at nouns which had the same gender across dialects. However, gender assignment varies quite a bit in Norwegian (cf. Beito 1954), so this was not always possible. In cases where a certain noun traditionally had a different gender in a given dialect compared to the expected gender in other dialects, this was taken into consideration in the analysis. Task 1 is described in more detail by van Baal et al. (2023; in press).

Task 3 is developed for the purposes of the present study. **Figure 1** shows two screens from the task.

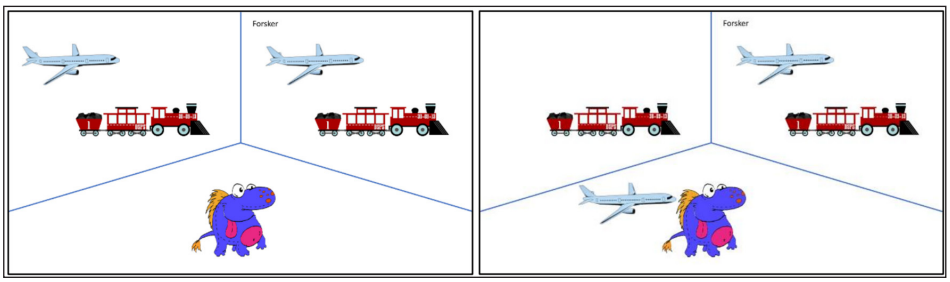

Figure 1: The first screen (left) shows Knut and two of the practice items, *fly*.N ('plane') and *tog*.N ('train'). The second screen (right) shows Knut stealing the plane from the participant.

The participants were told that the objects on the left were theirs, while the objects on the right belonged to the researcher. They were warned that the fantasy creature *Knut,* sitting below the objects, would steal one of the objects, and that their job was to tell the researcher what

he stole and from whom. Based on previous research (see Section 2.3–4), we expected more use of feminine postnominal forms than of feminine prenominal forms. To test the use of both constructions, we elicited both of them in two separate parts of the task. The desired interactions are demonstrated in (8).

Prenominal part of the task:

(8) a. Researcher: *Hva skjedde nå?*
'What happened now?'
Expected answer: *Knut stjal **mitt** fly.*
Knut stole my.N plane
'Knut stole my plane.'

Postnominal part of the task:

b. Researcher: *Hva skjedde nå?*
'What happened now?'
Expected answer: *Knut stjal fly-et **mitt**.*
Knut stole plane-DEF.N my.N
'Knut stole my plane'

As mentioned in Section 2.2, it is difficult to design a task that controls whether the participants use the prenominal or the postnominal possessives. Eliciting contrast or emphasis to make them produce first one of the patterns and then the other, proved impossible in a pilot study. Therefore, we opted for a design where the researcher instructed the participant explicitly to produce prenominal or postnominal forms, using neuter nouns as examples. The participants were shown the screens in **Figure 1**, and the researcher would exemplify how they should express the event. After the example, two more neuter practice items followed for the participant to practice the procedure.

The experiment was conducted with 20 items (4 strong feminine nouns, 4 weak feminine, 4 strong masculine, 4 weak masculine, 2 strong neuter, and 2 weak neuter – a subset of the 36 items in task 1). All participants completed the task twice, first using one construction (e.g., prenominal possessives), and then using the other one (e.g., postnominal possessives). Half of the participants in each group started with the prenominal possessives and the other half with the postnominal possessives. To add more variation, the items were "stolen" from both sides of the screen, eliciting both 1st and 2nd person possessives (*mi/min/mitt* and *di/din/ditt*). We expected 1st and 2nd person forms to behave the same with respect to the production of feminine forms. Knut always stole two objects from the same person, and the two objects had the same gender. The order of the items was randomized (but fixed so each participant and each part of the task had the same order). After randomization, the order was corrected manually so that there were never more than four items with the same gender following each other.

5 Results

5.1 Overall production of feminine forms

As mentioned, the data reported in this section is gathered from the GenVAC data set (Lohndal et al. 2023), and the data from task 1 (indefinite determiners and definite suffixes) is also reported in van Baal et al. (in press) but repeated here for convenience. The possessive data from task 3 is collected from the same participants, which allows us to do both inter- and intraindividual comparisons of the participants' production of feminine forms (henceforth, fem-production).

The elicitation tasks include nouns of all three genders. Looking at the results for the masculine and neuter nouns, we find that the traditional forms are generally intact for all groups.[9] For the remainder of this paper, we therefore only report the forms used with traditionally feminine nouns. **Table 5** sums up the production results for all participants in each of the 17 groups. For each group, the table reports the number and percentage of feminine forms compared to the total number of possible occurrences. For example, the children (A group) in Mo i Rana produced a total of 144 prenominal possessives modifying a feminine noun, and 95 of these (66.0%) had the feminine form (*mi*). The non-feminine forms produced with traditionally feminine nouns were, in an overwhelming majority of the cases, masculine (e.g., *min kake* 'my.M cake').

		Indefinite determiner (*ei* – task 1)	**Prenominal possessive (*mi* – task 3)**	**Definite suffix (*-A* – task 1)**	**Postnominal possessive (*mi* – task 3)**
Mo i Rana	A	88.8% 489/551	66.0% 95/144	98.9% 281/284	95.1% 137/144
	B	94.3% 560/594	87.5% 133/152	99.7% 299/300	99.4% 151/152
	C	98.2% 549/559	100% 144/144	98.6% 281/285	100% 144/144
Egersund	A	41.6% 258/621	44.9% 71/158	92.1% 291/316	84.4% 135/160
	B	79.3% 522/658	79.2% 133/168	96.7% 321/332	100% 168/168

(Contd.)

[9] As described in Section 4.2, a few participants did not display a stable distinction between masculine and neuter forms. They were excluded from the study.

		Indefinite determiner (*ei* – task 1)	Prenominal possessive (*MI* – task 3)	Definite suffix (*-A* – task 1)	Postnominal possessive (*MI* – task 3)
	C	90.1% 667/740	97.3% 179/184	95.5% 358/375	100% 184/184
Bodø	B	36.9% 232/628	49.4% 79/160	98.4% 312/317	99.4% 159/160
	C	94.7% 613/647	98.2% 164/167	99.1% 319/322	100% 167/167
Lyngdal	B	21.0% 126/599	28.3% 43/152	100% 302/302	100% 152/152
	C	87.2% 485/556	95.4% 145/152	98.1% 258/263	100% 152/152
Kristiansand	B	12.1% 72/594	2.0% 3/152	87.6% 261/298	94.1% 143/152
	C	64.9% 452/696	80.7% 142/176	98.3% 345/351	100% 176/176
Trondheim	B	11.8% 67/567	11.1% 16/144	97.2% 276/284	97.9% 141/144
	C	38.7% 294/759	51.6% 99/192	99.2% 379/382	100% 192/192
Stavanger	A	5.3% 32/599	8.6% 13/152	28.9% 87/301	28.7% 43/150
	B	0.6% 4/657	1.3% 2/160	36.3% 119/328	36.9% 59/160
	C	43.4% 343/792	53.0% 106/200	65.1% 259/398	72.5% 145/200

Table 5: Number of feminine forms out of the total number of possible feminine occurrences.

As seen from **Table 5**, the use of feminine postnominal forms (definite suffixes and postnominal possessives) is high for all groups except the three Stavanger groups. In most of the remaining groups, the score is at ceiling (>95%), and only Egersund-A and Kristiansand-B score below 90% on postnominal possessives and definite suffixes respectively. Considerably more

variation is found in the use of prenominal forms (the indefinite determiner and the prenominal possessive), both between groups and individuals. The graphs in **Figures 2** and **3** illustrate the variation between locations and age groups.

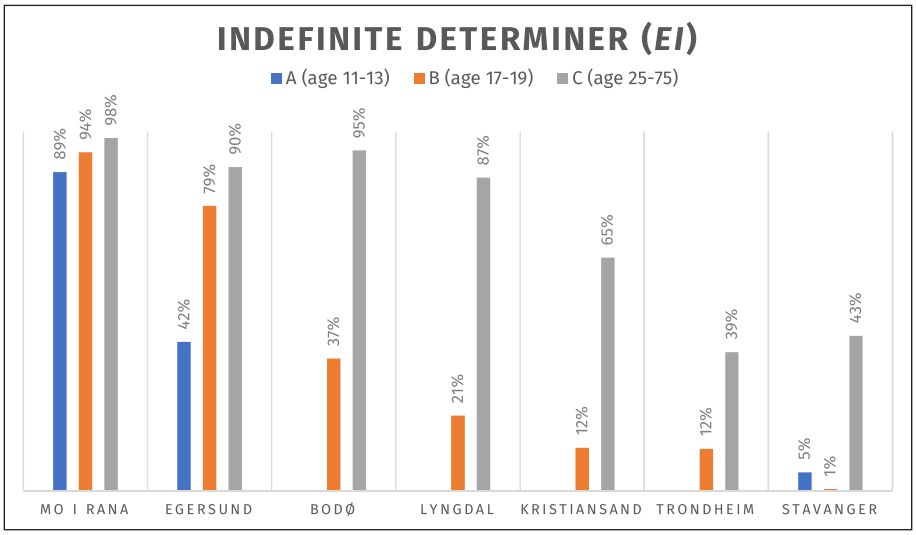

Figure 2: The use of the feminine indefinite determiner *(ei)* across all groups.

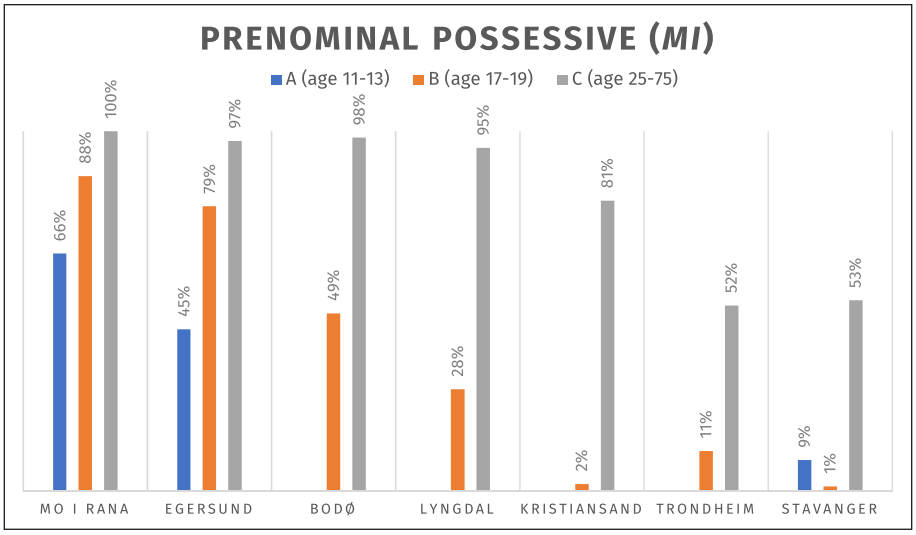

Figure 3: The use of the feminine prenominal possessives (*MI*) across all groups.

To see if there was a correlation between the use of *ei* and prenominal *MI*, we ran a *Spearman's rank correlation test.*[10] First, we tested the correlation between the indefinite

[10] First we used a *Shapiro-Wilk test* and found that the data was not normally distributed, making the *Spearman's rank correlation test* the best way to test the correlation.

determiner (*ei*) in task 1 and the prenominal possessive (*MI*) in task 3 for all participants. We find that there is a clear and significant correlation (rho = 0.810211, S = 1287631, p < 0.0001). We also ran the same test for the correlation between the definite suffix (*-A*) in task 1 and the postnominal possessive (*MI*) in task 3. This also came out as a significant correlation (rho = 0.6306608, S = 2484007, p < 0.0001). This means that when considering all the participants together, the use of *ei* and *-A* in the first task can predict the use of pre- and postnominal *MI* respectively in the third task. The phrase-internal combinations in the postnominal part of task 3, i.e., how the definite suffix (*-A* or *-en*) was combined with the postnominal possessive (*MI* or *MIN),* are reported in **Table 6**.

	-A	***-en***
MI	2466	0
MIN	3	305

Table 6: Total number (from all participants, all locations) of suffix–postnominal possessive combinations for all feminine nouns.

Of all the postnominal possessive constructions recorded in this task, there are no instances of *-en* + *MI (boken mi* 'book.DEF.M my.F'*)* and extremely few instances of *-A* + *MIN (boka min* 'book.DEF.F my.M'*)*. The three occurrences of the latter combination are produced by two different participants in different locations and age groups, and they constitute only 0.11% of the total number of produced postnominal possessive constructions. We therefore conclude that these mixed constructions can be considered as production errors rather than parts of any of the participants' grammar.

Before going into the statistical effects of age group and location, we look briefly at potential differences between items. In **Table 5** and **Figures 2** and **3**, all feminine nouns are collapsed into one category. In order to see whether there are differences between lexical items, the results for each item across all participants are presented in **Table 7**.

Item	**Translation**	**Weak/strong**	**Total**	**N pre-nominal *MI***	**% pre-nominal *MI***
kake	'cake'	weak	343	210	61%
krone	'crown'	weak	344	208	60%
geit	'goat'	strong	343	178	52%
mus	'mouse'	strong	344	191	56%

(Contd.)

Item	Translation	Weak/strong	Total	N pre-nominal *MI*	% pre-nominal *MI*
lue	'beanie'	weak	344	203	59%
klokke	'clock'	weak	344	203	59%
saks	'scissors' [sg.]	strong	344	184	53%
vogn	'cart'	strong	343	184	54%

Table 7: Prenominal *MI* produced with traditionally feminine nouns, presented in order of appearance in the possessive task – results from all participants.

Earlier studies (e.g., Busterud et al. 2019; Urek & Lohndal & Westergaard 2022) have suggested that the weak (vowel) ending may be a cue for feminine nouns, since nouns of this type are often combined with feminine forms. Our results also suggest that there might be a small difference in fem-production between weak and strong feminine nouns. However, this will be left to future research, and for the remainder of this paper, we treat all the feminine nouns as one category.

5.2 Differences between locations and age groups

It is clear from **Figures 2** and **3** that there is variation in fem-production depending on both location and age. This was tested with a binomial mixed effects model (glmer-function of the R-package *lme4*, Bates & Mächler & Bolker & Walker 2015) where the predictors were location and age group. Using the Anova function in R to compare the models, we obtained the p-values reported in this section. All models include random effects for participant and lexical item. The full output of the statistical models is included in *Appendix 2*. As only some of the locations have three age groups, we had to run two different models. First, we ran a model with the B and C groups from all seven locations – we refer to this as the 7-BC model. Then the model was run again with the A, B, and C groups from Stavanger, Egersund, and Mo i Rana – referred to as the 3-ABC model.

Starting with the production of feminine prenominal possessives, both models show a statistically significant effect of location (7-BC: $\chi^2 = 166.93$, df(6), $p < 0.0001$; 3-ABC: $\chi^2 = 139.42$, df(2), $p < 0.0001$) and age group (7-BC: $\chi^2 = 146.13$, df(1), $p < 0.0001$; 3-ABC: $\chi^2 = 52.175$, df(2), $p < 0.0001$). The 7-BC model also reveals an interaction effect between the two predictors ($\chi^2 = 156.396$, df(6), $p < 0.05$), indicating that the effect of age group is different across locations. In the 3-ABC model, however, there was no interaction effect ($\chi^2 = 7.3464$, df(4), $p \approx 0.1187$). This is probably because there are considerably fewer data point in this

model (9 groups as opposed to 14 in the 7-BC model). To sum up, we find clear differences in the production of the feminine prenominal possessive between locations and age groups. The younger groups generally display lower fem-production than the older groups.

Looking at the effect of location and age group on the fem-production of postnominal possessives, there are fewer differences between groups. In the 7-BC model there is no effect of neither location ($\chi^2 = 7.8712$, df(6), $p \approx 0.2477$) nor age ($\chi^2 = 0.5423$, df(1), $p \approx 0.4615$), and there is no interaction effect ($\chi^2 = 0$, df(6), $p \approx 1.0$). This is expected, given that the *MI* production is generally high across most locations and age groups. In the 3-ABC model there is, however, an effect of location ($\chi^2 = 22.374$, df(2), $p < 0.0001$), but not of age group ($\chi^2 = 1.2828$, df(2), $p \approx 0.5266$), and there is no interaction effect ($\chi^2 = 0.2751$, df(4), $p \approx 0.9914$). The location effect in this model is probably due to the relatively low *MI* production in the three Stavanger groups, compared to the groups in Egersund and Mo i Rana. In this model, the Stavanger groups constitute 1/3 of the datapoints, as opposed to 1/7 in the 7-BC model, which means that the Stavanger data have a bigger impact in the 3-ABC model and thus the difference comes out as significant. In general, as reflected in the numbers in **Table 5**, there is little variation in the production of the feminine postnominal possessive. The effects of location registered in model 3-ABC reveal the considerably lower postnominal fem-production in the three Stavanger groups, which is also clearly visible in **Table 5**.

5.3 Individual variation

The results in the previous sections outlined the general tendencies found across groups. This section is concerned with inter- and intraindividual variation within these groups. In **Table 8**, the participants are sorted into three groups based on their level of production of the two feminine prenominal forms, *ei* and prenominal *MI*. The threshold for consistent fem-production is set at ≥ 87.5, and this is the case for the remainder of this paper.[11]

The fem/masc-mixers constitute 24.9% of the participants in the determiner task and 20% in the possessive task. These speakers use both feminine and masculine forms with traditionally feminine nouns. In other words, most participants are either consistent fem-producers or consistent masc-producers. It is also noteworthy that the *MI/MIN* mixers and the *ei/en* mixers are not always the same individuals: Only 39 participants (11.3%) are mixers in both tasks. This is illustrated in **Table 9**.

[11] Normally, the threshold for consistent production is set at 90% (see Cazden 1968; Brown 1973). However, as there are only eight feminine nouns in the possessive task, one deviation gives 87.5%. To keep the threshold consistent, we have used 87.5% as the threshold for the determiners as well.

Location and age group		Consistent fem-producers		Fem/masc-mixers		Consistent masc-producers	
		≥87.5% *ei*	≥87.5% MI	*ei* and *en*	MI and MIN	0% *ei*	0% MI
Mo i Rana	A	**14/18**	**9/18**	4/18	8/18	0/18	1/18
	B	**16/19**	**16/19**	3/19	2/19	0/19	1/19
	C	**18/18**	**18/18**	0/18	0/18	0/18	0/18
Egersund	A	4/20	6/20	**13/20**	6/20	3/20	**8/20**
	B	**12/21**	**11/21**	9/21	10/21	0/21	0/21
	C	**20/24**	**22/23**	4/24	1/23	0/24	0/23
Bodø	B	5/20	**7/20**	6/20	**7/20**	**9/20**	6/20
	C	**19/21**	**20/21**	2/21	1/21	0/21	0/21
Lyngdal	B	1/19	1/19	**10/19**	**9/19**	8/19	**9/19**
	C	**15/18**	**18/19**	3/18	1/19	0/18	0/19
Kristiansand	B	1/19	0/19	2/19	3/19	**16/19**	**16/19**
	C	**14/22**	**14/22**	4/22	6/22	4/22	2/22
Trondheim	B	1/18	2/18	6/18	0/18	**11/18**	**16/18**
	C	6/24	**12/24**	**9/24**	3/24	**9/24**	9/24
Stavanger	A	1/19	1/19	1/19	2/19	**17/19**	**16/19**
	B	0/21	0/20	1/21	2/20	**20/21**	**18/20**
	C	8/25	**9/25**	**9/25**	8/25	8/25	8/25

Table 8: Individual prenominal fem-production (*ei* and *MI*) in each group. The production patterns used by most speakers are marked in bold for each group.

	Only *ei*	*ei*/*en*	Only *en*
Only *MI*	139 (40.4%)	21 (6.1%)	5 (1.5%)
MI*/*MIN	14 (4.1%)	39 (11.3%)	16 (4.7%)
Only *MIN*	2 (0.6%)	25 (7.3%)	83 (24.1%)

Table 9: The use of *MI* and *ei* by all participants who completed both tasks 1 and 3 (n = 344).

The mixers are not evenly distributed across locations and age groups. **Table 10** shows all groups where more than 30% of the participants mix either *ei/en* or *MI/MIN*.

	***ei/en*-mixers**	**MI/MIN-mixers**
Mo i Rana-A	28%	44%
Egersund-A	70%	30%
Egersund-B	43%	48%
Bodø-B	35%	35%
Lyngdal-B	53%	47%
Trondheim-B	33%	0%
Trondheim-C	38%	13%
Stavanger-C	36%	32%

Table 10: Groups with more than 30% mixers.

In some groups, the number of *ei/en*-mixers is very different from the number of MI/MIN-mixers. At the group level we find that the feminine prenominal possessive score is generally, but not always, higher than the feminine indefinite article score. The number of participants using *MI* consistently is higher than the number of participants using *ei* consistently (48% vs. 45.1% of the participants), but the number of participants using *MIN* consistently is also higher than the number of participants using *en* consistently (32% vs. 30.3%), indicating that there is in general less mixing in the possessive task than in the determiner task. This can potentially be explained by the fact that there are fewer items in the possessive task than the determiner task (i.e., less chance of variation), but it is also the case that the determiner task was always performed before the possessives task. At any rate, the difference is small. The effect of time, if any, seems to be that participants become more assertive, choosing one form over the other instead of using both, but whether they use more or less feminine forms in the latter task, varies between individuals.

In the remainder of this subsection, we look at how individual speakers combine the different prenominal and postnominal forms. We have already seen that the loss of feminine prenominal forms does not reflect the loss of feminine postnominal forms, as the latter are often retained. In **Table 11**, we see the individual production of pre- and postnominal MI across all groups, where for instance 166 participants consistently produce *mi* both prenominally and postnominally.

Postnominal → Prenominal↓	***MI***	***MI/MIN***	***MIN***
MI	166 (48.1%)		
MI/MIN	66 (19.1%)	3 (0.9%)	
MIN	66 (19.1%)	19 (5.5%)	25 (7.3%)

Table 11: The use of feminine prenominal and postnominal possessive forms by all participants who produced both forms (n = 345).

We see clearly that there is an interrelationship (although not a direct correlation) between the use of prenominal and postnominal MI: The feminine postnominal possessive is only lost when the feminine prenominal possessive is also lost. This trend is maintained also if we include the participants' production of feminine indefinite and definite articles (*ei* and *-A*). In **Table 12**, we have excluded all participants who did not complete (or produce a sufficient number of forms in) both tasks. We have then merged the participants (n = 343) into one group. We have combined the prenominal forms (*ei* and prenominal *MI*) to one category, *pre-F*, and likewise the postnominal forms (*-A* and postnominal *MI*) into another category, *post-F*.

Postnominal → Prenominal↓	**≥87.5% post-F (*-A*, *MI*)**	**0 < post-F < 87.5% (*-A/-en*, *MI/MIN*)**	**0% post-F (*-en*, *MIN*)**
≥87.5% pre-F (*ei*, *MI*)	147		
0 < post-F < 87.5% (*ei/en*, *MI/MIN*)	101	11	1[12]
0% post-F (*en*, *MIN*)	43	23	17

Table 12: Production of feminine prenominal and postnominal forms by all participants who produced all four forms (n = 343).

Figure 4 shows the actual level of fem-production in both prenominal and postnominal forms for each participant. Again, we see that the feminine postnominal forms are never lost by the speakers using the feminine prenominal forms.

5.4 Potential self-priming

A potential task effect is that participants may self-prime because the feminine postnominal possessives are used more frequently than the prenominal ones. That is, the use of postnominal *MI* could prime the use of prenominal *MI,* resulting in a higher production of prenominal *MI* among

[12] This participant has only one occurrence of *ei* and none of prenominal *mi*.

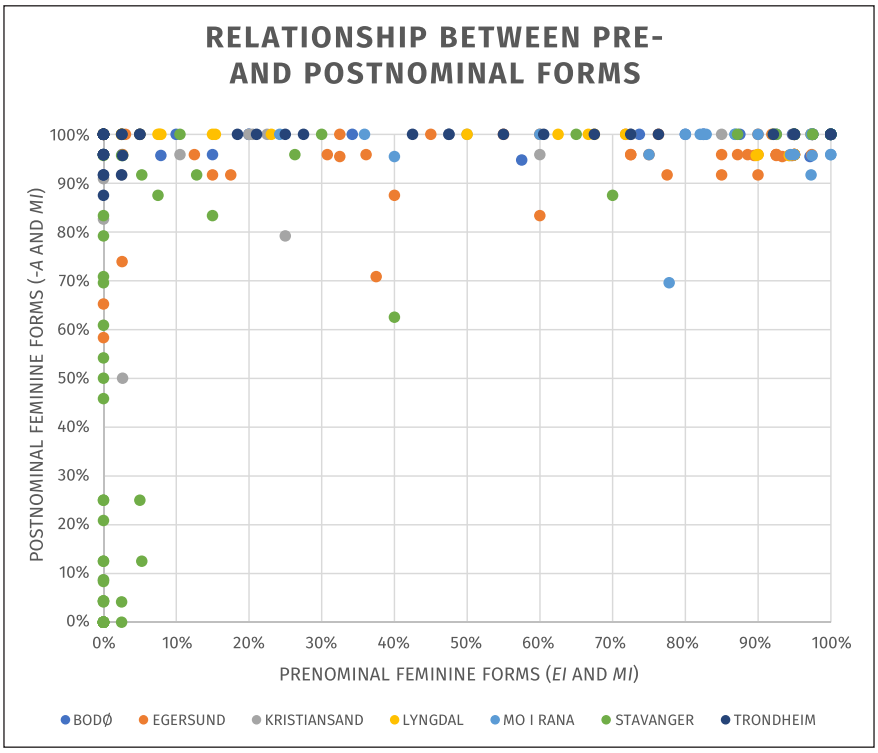

Figure 4: The correlation between prenominal and postnominal feminine forms – all participants (n = 343). Not all participants are visible in this graph; because most of them have a high production of postnominal forms, their dots are overlapping. However, the approximate distribution of participants in the different parts of the graph can be seen in **Table 12**.

the participants starting with the postnominal possessives. This was controlled for by having half of the participants in each group start with the prenominal, and the other half with the postnominal possessives. If we combine all participants across age groups and locations, the mean prenominal *MI* production score is 56.8%. The participants starting with postnominal possessives use on average 56.5% prenominal *MI*, while the participants starting with prenominal possessives use 57.1% prenominal *MI*. There is in other words no overall difference between the two groups. However, the total score could conceal fluctuations between the locations, so we tested the scores for the pre- and post-beginners for each location as well. In most locations the scores are very similar. We find the biggest difference between the two groups in Kristiansand, where the post-beginners score 49.4% contra the pre-beginners at 39.3%, and in Lyngdal, where the post-beginners score 55.6% and the pre-beginners 67.5%. Firstly, the difference is small, and secondly, in Lyngdal the post-beginners actually score lower than the pre-beginners, contrary to what we would expect from a task effect. When looking at individual scores, the differences between the groups seems to be due to individual fluctuations. For example, in the Kristiansand-C group, there are only two participants with 0% prenominal *MI*-production. They are both in the post-beginner group, but they are also both among the participants with 0% *ei*-production, which suggests that their low *MI*-production

is independent of which of the possessive sub-tasks they did first. To sum up, we do not find any indications of self-priming from the postnominal to the prenominal part of the task.

6 Discussion

In Section 3, we presented three research questions and four hypotheses. For convenience, they are repeated here:

RQ1 To what extent are the feminine possessive forms lost in Norwegian dialects?
RQ2 Are the two feminine prenominal forms (*mi* and *ei*) disappearing at the same time?
RQ3 What is the relationship between the prenominal feminine forms (*ei* and *mi* and the postnominal forms traditionally used on feminine nouns (*-A* and *mi*)?

H1 The rate of the loss of feminine gender forms varies geographically.
H2 The loss of feminine gender forms started at different points in time in different dialects.
H3 The loss of the indefinite article *ei* and the prenominal possessive *mi* happen in parallel.
H4 The definite suffix *-A* and the postnominal possessive *mi* are retained across the investigated dialects.

6.1 A change across dialects

Our results clearly show that prenominal feminine gender forms (*ei* and *mi*) are disappearing across Norwegian dialects. For the prenominal possessives, we see a trend that is very similar to that of the indefinite determiners: The fem-production differs both between locations and between age groups within each location. For the postnominal fem-production, there is generally little variation between locations and age groups.

The difference between age groups and locations reveals considerable variation in the nature of the change. Regarding the starting point of the language change, we see that in some locations (e.g., Stavanger), the use of feminine forms is low even in the adult group – indicating that the change has been going on for a while. In other locations, such as Mo i Rana, the decrease in fem-production has only just started in the youngest group, indicating a recent change. By comparing the different age groups within one location, we can say more about the rate of the change. For instance, in Bodø and Lyngdal we see a big difference in fem-production between the B and C groups, indicating that the change is happening very fast. In Mo i Rana and Egersund, on the other hand, the differences between the age groups are smaller, indicating that the change is happening at a slower rate. All the data is collected within the frame of one year, meaning that we are taking an apparent-time rather than a real-time approach to language change (see Labov 1966: 199ff; Cukor-Avila & Bailey 2013). This means that we cannot exclude the possibility that the level of fem-production changes throughout the lifespan, and that the younger participants

will start using more feminine forms as they get older. However, no earlier studies have found such a pattern.[13] Yet, this is an empirical question that can only be answered by monitoring dialects or speakers over time.

6.2 A systematic change

We have already established that both *ei* and prenominal *MI* are disappearing in many groups. In this section, we discuss the correlation between the use of these two forms at the individual level.

The correlation test (see Section 5.1) showed that there is a significant correlation between the use of *ei* (task 1) and prenominal *MI* (task 3). From this we can conclude that the two elements disappear in parallel. If only one of the elements disappeared, this would indicate a process of syncretism (i.e., a merger of e.g., the lexical elements *en* and *ei,* but not of the underlying feminine/masculine gender distinction).[14] However, the fact that they are disappearing at the same time indicates the loss of the underlying syntactic gender distinction, not just of the surface forms.

The trend reflected in this statistical correlation can also be seen in **Table 9** (Section 5.3). Although we find all combinations of *ei/en* and *MI/MIN* production, there is a clear tendency towards preferring the same pattern in both tasks, i.e., either

1. using *ei* and *MI* consistently, or
2. mixing both *en/ei* and *MI/MIN*, or
3. using *en* and *MIN* consistently.

In total, 75.8% of the participants use one of these three patterns. The remaining 24.2% change the level of fem-production through the set of tasks, but as mentioned in Section 5.3, there are instances of both higher and lower fem-production in the possessive task compared to the determiner task: many of the determiner-mixers settle as consistent MI-users or consistent MIN-users in the course of the experiment. This could be an indication that the speakers in question are alternating between two competing grammars, one three-gender system and one two-gender system (see also the discussion in Section 6.4 below).

In **Table 10** (Section 3.5) we see that the highest number of mixers belong to the groups where the gender change is well underway. In the locations where the change has only just started (Mo i Rana, Egersund, Bodø), only the youngest groups have a high number of mixers,

[13] As an anonymous peer reviewer points out, it is also possible, and maybe more likely given the general decline of feminine forms, that the younger speakers will use even less feminine forms through the lifespan.

[14] An example of a similar process of syncretism is the loss of feminine adjectival forms in Norwegian. In most varieties of modern Norwegian, there are few or no distinct feminine adjectival forms (Faarlund et al. 1997: 366–371), as opposed to Old Norse (Haugen 2006: 148–149). The loss of these forms is an example of syncretism, as the feminine realizations disappeared while the underlying feminine-masculine distinction was maintained (and expressed on other elements).

as the older participants are still consistent fem-users. In Stavanger, on the other hand, the adult group has many mixers, but not the children and high-school groups, because the process of feminine gender loss is already completed in the younger participants.

6.3 When three genders become two

Earlier studies (Rodina & Westergaard 2015; 2021; Busterud et al. 2019; van Baal et al. in press) have found an asymmetry in the loss of feminine forms in Norwegian: While the feminine prenominal forms are often vulnerable and subject to change, the feminine postnominal forms have been described as generally robust. The current study confirms this pattern.

As presented in **Table 5** (Section 5.1), the feminine postnominal possessives are retained to a similar degree as the definite suffixes, i.e., most groups perform at ceiling (>95%). At the group level, there are five exceptions, and all these five groups produce less than 95% feminine forms of both definite suffixes and postnominal possessives. Egersund-A (92.1% *-A* and 84.3% *MI*) and Kristiansand-B (87.6% *-A* and 94.1% *MI*) are both close to or above 90%, suggesting that we might see the beginning of a change in the postnominal forms, but still they must be considered relatively stable at this point. In the three Stavanger groups, on the other hand, we see more solid evidence that an actual change is going on.

In answering RQ3, the remainder of this section focuses on individual speakers and how they combine different forms. The speakers who do not use the feminine postnominal forms will be particularly relevant for the following part of the discussion. **Table 12** and **Figure 4** (Section 5.3) show the individual fem-production of all the participants. Although there is bound to be some variation in a sample consisting of so many individual speakers, there seems to be a clear implicational scale: Speakers who have maintained the feminine/masculine distinction on prenominal elements also use the feminine postnominal forms (*-A* and *-A* + *MI*). These latter forms may be vulnerable for speakers who have lost the feminine/masculine gender distinction on the prenominal forms, but at this point, most speakers still use *-A* and postnominal *MI.* This indicates that the (potential) loss of feminine postnominal forms depends on the absence of feminine prenominal forms.

The form of the postnominal possessives, although separated from the noun in writing, is clearly conditioned by the form of the definite suffix: There are no instances of *-en* + *MI (boken mi* 'book.DEF.M my.F*')* and virtually none of *-A* + *MIN (boka min* 'book.DEF.F my.M*')* within the same phrase (see **Table 6**). In other words, we see that postnominal *MI* always follows *-A,* and never any other suffix. This is also what is found in earlier research (Lødrup 2011; Svenonius 2017; Rodina & Westergaard 2021). As mentioned in Section 2.4.3, the question of how the postnominal possessives should be analyzed may be one which cannot be solved empirically. The data from the current study confirms that *mi* always follows *-A*, but recall that *-A* includes different realizations, such as *-a, -e,* and *-o*. In Svenonius' (2017) analysis, *mi* is phonologically conditioned by the vowel /a/. This only works in dialects where the *-A* suffix is realized as *-a*. In the results from Egersund,

we see that *mi* can also follow /e/ and /o/, but only in non-neuter phrases. Neuter nouns also end in /e/ in the definite form, but they are never combined with *mi*. In dialects with other realizations than *-a* of the feminine definite suffix, the phonological rule stated in (7) must be modified so that it is specified for the relevant vowel qualities. The syncretism between the definite suffix used on neuter nouns and strong feminine nouns in the Egersund dialect, /e/, shows, as Svenonius (2017) also emphasizes, that *mi* is only an allomorph of the common gender form *min*, leaving the neuter/non-neuter distinction intact regardless of the phonological rule.

As seen in this and previous studies, there is, inarguably, an asymmetry in how feminine prenominal (*ei* and *MI)* and postnominal (*-A* and *MI)* forms behave in a language change. A similar asymmetry is found in L1 acquisition of the same forms. The suffixes are acquired before the indefinite articles, and it is often assumed that nouns and their definite suffixes are acquired together (Anderssen 2006: 179ff; Rodina & Westergaard 2015). The asymmetry in how the prenominal elements and the suffixes are both acquired and lost has often been presented as evidence for the distinction between gender (expressed by the prenominal elements) and declension class (expressed by the definite suffixes) (see Busterud et al. 2019; Rodina & Westergaard 2015; 2021; Lohndal & Westergaard 2016; see section 2.4). Recall that according to this analysis, the definite suffixes are never exponents of gender, and the *-A* suffix is therefore not affected by the loss of feminine gender. This analysis is clear and consistent: It predicts a difference between indefinite articles and definite suffixes in the case of a gender change: Because the feminine definite suffix is not a gender exponent, it is not affected by the gender change. What this analysis does not account for, however, is the close relationship that nevertheless exists between the *-A* suffix and the feminine prenominal forms.

This relationship is better accounted for in different analyses: Following Svenonius (2017), the definite suffixes may be considered gender exponents in Norwegian, as long as there is additional evidence to postulate the existence of a grammatical gender feature in the grammar. This is also in line with Enger (2004) and Dahl (2000). These analyses adopted a slightly altered version of Hockett's (1958: 231) gender definition, extending it to "the behavior of associated morphemes" (rather than just "associated words"). Following Svenonius (2017), the *-A* suffix can only mark feminine gender in a system that has other feminine markers, i.e. three-gender systems. In two-gender systems, which lack other feminine markers, *-A* must be an exponent of common gender, the relevant gender distinction being that between common and neuter gender, which are separated by their determiners and adjectives as well as their definite suffixes. The alternation between *-A* and *-en* in two-gender systems is analyzed as declension class. This contrasts with the neuter form *-et* which always corresponds to a neuter gender feature and is therefore an exponent of neuter gender both in two- and three-gender dialects.

We believe that Svenonius' (2017) analysis captures the patterns found in the current study better than the analyses based on Hockett's definition. Firstly, it is clear that the definite

feminine suffix *-A* (and the postnominal possessive form *MI*) can disappear, but that this is entirely dependent on the absence of a feminine/masculine gender distinction marked on freestanding elements. Secondly, Svenonius' analysis captures the important insight that not all speakers of Norwegian necessarily share the same conceptualization of grammatical gender. In a three-gender system with a one-to-one mapping between gender and definite suffix form, each suffix can easily be treated as an exponent of each gender. In systems where the mapping is not one-to-one (that being the hybrid systems described in this study, or the system of some traditional three-gender systems that have several declension classes (i.e., different suffixes) within one gender, like in traditional Egersund dialect), the speakers must resort to the notion of declension class in order to systematize the alternation between different suffixes. However, the fact that *-A* and *-en* must be exponents of different declension classes in one system, does not prove that they cannot be exponents of different genders in another system. It remains to be seen how the postnominal forms evolve over time in groups and individuals who have lost the prenominal feminine/masculine distinction.

6.4 Future research

Svenonius (2017) distinguishes between two-gender and three-gender systems. The majority of our participants (65%) fall into one of these groups, as they either always or never use *ei* and prenominal *MI*. However, the remaining 35% of the participants are neither clear three-gender speakers nor clear two-gender speakers. This is to be expected in a changing system, and we see clearly from **Table 10** that the mixers mainly belong to the groups that are in the middle of the change. Earlier studies (Rodina & Westergaard 2021; Klassen & Lundquist & Westergaard 2023) have also reported that individuals tend to mix feminine and masculine forms, and the proportion of mixers varies a lot depending on participant selection. At the group level, this makes sense. The question is how this should be understood at the individual level. How is gender conceptualized within an individual who uses feminine gender forms only to some extent? Is the F feature still present in their syntax, but only assigned to a limited class of words (i.e., only to a subset of the traditional feminine nouns)? Or do these individuals have two competing systems, one two-gender system and one three-gender system, which they use interchangeably? Preliminary findings suggest that the latter explanation is more likely, but this question will be addressed further in future research.

7 Conclusion

This paper discusses how the ongoing change in feminine gender in Norwegian dialects affects the use of feminine possessives. Our study adds to the existing research on feminine gender in Norwegian, which typically only investigates prenominal determiners and definite suffixes (though see Rodina & Westergaard 2021). In this study, we elicited prenominal and postnominal possessives from 2–3

age groups in seven locations across Norway. The results show that the use of feminine possessives varies across dialects and that younger participants typically use fewer feminine possessives than older participants. Moreover, we find a difference between prenominal and postnominal forms: in all locations and age groups, replacement of feminine *mi/di* by masculine *min/din* is more frequent with prenominal forms than with postnominal forms. If prenominal feminine forms are retained, postnominal forms are retained as well. Thus, the loss of prenominal feminine possessives enables the loss of postnominal feminine possessives but does not automatically lead to that.

The asymmetry between prenominal and postnominal forms has previously been documented for indefinite determiners and definite suffixes (Fretheim 1985; Lødrup 2011; Rodina & Westergaard 2015; 2021; Busterud et al. 2019; van Baal et al. in press). The present study includes the same participants as van Baal et al. (in press). Comparison shows that there is a strong correlation between loss of (prenominal) indefinite *ei* and prenominal *mi*, as well as between the loss of the definite suffix *-A* and postnominal *mi*. Furthermore, postnominal *mi* only occurs in phrases that also contain the definite suffix *-A*. This shows that the loss of feminine gender affects several elements that inflect for gender, not just the indefinite determiner. Therefore, we argue that the change should be understood as the loss of a feminine feature in the syntax rather than the loss of specific feminine forms (i.e., syncretism).

In addition, we argue that the observed asymmetry between prenominal and postnominal forms is well captured by the analysis in Svenonius (2017) that the definite suffix *-A* is a feminine gender marker in a three-gender system but changes to a declension class marker when (but only when) the feminine gender feature is lost. In line with Svenonius (2017), we consider the feminine postnominal possessive in two-gender dialects as morphophonologically conditioned by the form of the definite suffix. As a result, the forms *mi/di* can still be found in dialects that have lost the feminine gender but kept the 'feminine' *-A*-suffix as a declension class. Ultimately, the theoretical issues discussed in this paper come down to how grammatical gender is defined. The empirical contribution of this study lies in the documentation of the clear relationship between pre-and postnominal feminine forms in a large sample of speakers across dialects and age groups. We argue that a gender definition should be able to capture this relationship. Another strength of this analysis is that an exponent can be reanalyzed and categorized differently by different speakers and groups.

This study shows how investigating several linguistic elements can shed more light on the ongoing change in feminine gender in Norwegian and its relation to declension class markers. Including more elements that have distinct feminine forms (plurals, adjectives, and anaphoric pronouns) will provide more insights into the nature of the change. In future research, we also plan to have a closer look at intra-speaker variation to investigate how individual speakers behave in a process of ongoing change and to help understand how grammatical features like gender are organized in the speakers' grammars.

Abbreviations

C = common gender; DEF = definite; F = feminine gender; M = masculine gender; N = neuter gender.

Data availability

The full set of experimental material and transcriptions will be made available in 2025: https://dataverse.no/dataset.xhtml?persistentId=doi:10.18710/TKNNRQ.

A preliminary version is available here: https://dataverse.no/privateurl.xhtml?token=7372d153-b795-42a4-8c34-bc37d30d2d1c.

Supplementary file

The supplementary file can be accessed at: https://doi.org/10.16995/glossa.15391.s1

Ethics and consent

Informed consent was obtained from all participants and the study was reviewed and approved by the Norwegian Agency for Shared Services in Education and Research, which is responsible for data protection services in Norway.

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Competing interests

The authors have no competing interests to declare.

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