The role of grammatical gender in noun-formation: A diachronic perspective from Norwegian

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1. The relationship between gender and word-formation

According to Corbett (1991: 1) "[g]ender is the most puzzling of the grammatical categories". In modern languages, however, gender is most often seen as nothing more than an abstract inherent classificatory feature of nouns that triggers agreement in associated words. Given this perspective of gender as a redundant category, the question arises of why it nonetheless is so persistent in a great number of languages. This question has been answered inter alia by referring to the identifying and disambiguating function gender can have in discourse (e.g., Corbett 1991: 320–321). In this article further evidence is provided for viewing grammatical gender (henceforth *gender*) as an integral part of Cognitive Grammar, more specifically the domain of word-formation.

The relationship between grammatical gender and word-formation can be approached from (at least) two different angles. In literature dealing with gender assignment, characteristics of word-formation are often used as a base for assigning gender to nouns. This approach is presented in section 1.1. On the other hand, gender is described as a feature involved in the formation of new nouns. This perspective is introduced in 1.2.

1.1. Gender assignment based on word-formation

Regularities between the gender of nouns and their derivational morphology can be detected in a number of languages. Gender can be tied to overt or covert derivational features. The former type is usually realized by suffixation, e.g., Norwegian *klok* (adj. 'wise') + *skap* à *klokskap* (masculine [M] 'wisdom'). The latter type we find in nouns created by conversion, e.g., Norwegian (*å*) *kaste* (v. 'throw') à *kast* (M 'throw'). Furthermore, regularities between gender and derivational features can be more or less consistent. In Norwegian, some derivational suffixes are unambiguously

tied to only one gender. The suffixes *-ersk, -heit, -inn*, for example, are only found in feminine (F) nouns, whereas *-ar, -ling, -nad* are M, and *-eri, -krati* are N. Other suffixes, such as *-in* (F/M) or *-skap* (M/neuter [N]), are compatible with more than one gender.

Naturally, these ties have led grammarians to formulate gender assignment rules based on derivational morphology. For Norwegian, Trosterud (2001: 43–44) assumes inter alios the following assignment rules (adapted by the author):

(1)   a. Nouns derived in *-inn* [...] are F.
       b. Nouns converted from verbal stems are N.

In case of only partially consistent regularities between gender and derivational features, other lexical properties of nouns are sometimes referred to in order to account for the assignment of gender. For Norwegian deverbal nouns derived in *-ing*, the distinction between F and M is closely related to the distinction between abstract and concrete. Thus, the abstract noun *køyring* (F 'driving' from *køyre* v. 'drive') takes F, while the concrete noun *gjelding* (M 'gelded animal' from *gjelde* v. 'geld') is assigned M.

The basic idea behind the approach described in this section is that the derivational morphology of a noun in some cases determines its gender. The relationship between the two features is thus seen as directional, from word-formation to gender assignment.

1.2. Gender as a feature of word-formation

Another perspective on the relationship between gender and word-formation is provided in literature dealing with word-formation. In some languages gender is described as a feature involved in the formation of new nouns. In particular, gender is essential in word-formation processes reflected in pairs of animate nouns like the ones in (2).[1] In these examples, apart from declension class, gender is the only formal feature that distinguishes the noun in each pair and can thus be considered as a constitutive factor in the word-formation process behind these word pairs. The sample set in (2) is limited to animate concepts, and the nouns in such pairs are sometimes called motion-nouns (cf., e.g., Corbett 1991: 67). The word-formation process resulting in such couples is accordingly named motion (German "Movierung"), i.e., the formation of nouns for female animates

from noun for male animates (or vice versa) (Bergenholtz and Mugdan 2000: 444).[2]

		M	F
(2)	a. LAT	*amic-us* ('male friend')	*amic-a* ('female friend')
		lup-us ('male wolf')	*lup-a* ('female wolf')
	b. ITA	*maestr-o* ('male teacher')	*maestr-a* ('female teacher')
		ragazz-o ('boy')	*ragazz-a* ('girl')
	c. GRE	*adherf-os* ('brother')	*adherf-i* ('sister')
		non-os ('godfather')	*non-a* ('godmother')
	d. LIT	*lieùv-is* ('male Lithuanian')	*lieùv-ė* ('female Lithuanian')
		pedagòg-as ('male teacher')	*pedagog-ė* ('female teacher')
	e. OHG	*hêrr-o* ('master')	*hêrr-a* ('mistress')
		gastgeb-o ('male host')	*gastgeb-a* ('female host')

However, the gender pattern illustrated in (2) is not restricted to the domain of biological sex only. In Italian we find a corresponding pattern in some noun pairs denoting 'fruit' and 'tree' respectively. Examples are given in (3) below (Schwarze 1988: 14, 454, cf. also Koch 1999: 158):

		F	M
(3)	a.	*aranci-a* ('orange')	*aranci-o* ('orange tree')
	b.	*mel-a* ('aple')	*mel-o* ('aple tree')
	c.	*per-a* ('pear')	*per-o* ('pear tree')

In (3) the feminine nouns on the left denote a fruit, and the masculine nouns on the right denote the tree on which this fruit grows.

The patterns illustrated in (2) and (3) can be generally labelled as *gender patterns*:

(4) a. A *gender pattern* is a set of etymologically related nouns which are formally distinguished solely by their gender (and optionally by their inflectional class membership).
  b. The assumed word-formation process resulting in such gender patterns is accordingly named *gender patterning*.

The derivative aspect of gender outlined above is also recognized by Mel'čuk, who provides the most extensive formal definition of gender known to me. "Differences in gender[...]", as he puts it, "can be exploited by the language in order to express certain derivatemes, but always in an

irregular, unsystematic way − that is, in isolated cases" (Mel'čuk 2006: 329). From this, Mel'čuk concludes that the described property of gender "is too capricious (because it is too lexicalized) to seriously affect the essence of a gender[...] system" (Mel'čuk 2006: 329). In a similar vein, Koch (1999: 158) touches upon the issue, declaring it to be "of minor importance". On the other hand, Aikhenvald (2007: 37) in her survey of typological distinctions in word-formation revalues the status of gender patterns, referring to them as a "derivational device". While these accounts provide different evaluations of the status of gender, they actually fail to elaborate on the phenomenon in depth but mostly rely on data presented in overview works such as reference grammars.

The aim of this paper is to present a more thorough analysis of how gender relates to the domain of lexical development. More specifically, it will be examined in how far gender constitutes a cognitively salient pattern of word-formation. In this way, the study strives to contribute to our understanding of the nature of lexical structure and organization. The analysis is limited to Norwegian data and takes its starting point in gender patterns as defined in (4). To my knowledge, this phenomenon has not been studied in any North Germanic language. The present study contributes thus to the field in three ways. First, it adds to a more complete description of the Norwegian language. Second, it sheds new light on a lesser studied word-formation pattern in general. Finally, as will be argued in chapter 2, gender patterns can be accounted for in a cognitive network model. It will also be demonstrated how the model can deal with gender assignment based on word structure and, thus, cope with both aspects of gender outlined in 1.1. and 1.2. above. In this respect, the study thirdly renders further support for a cognitive approach to the inquiry of language. In addition, section 2 specifies the methods and the data used in this study. The data is analysed and interpreted synchronically and diachronically in chapter 3. Finally, the article is rounded up with concluding remarks in chapter 4.

2. Background

2.1. Segmental derivation

The theoretical framework for this study is founded on the network model proposed in Bybee (1985 and later). Morphologically complex words are, like root words, stored in the lexicon. But the lexicon in this model is not purely a list of individual items (cf. Di Sciullo and Williams 1987: 3).

Rather, words are connected to each other in a structured way. Connections are found on all levels of lexical specification: phonological, semantic, and syntactic. Morphological word structure emerges from the connections between words. Essentially, these connections are bi-/multidirectional, and within a given lexical domain directionality can vary locally. The strength of the connections is influenced, on the one hand, by the grade of similarity between the items, and, on the other hand, by type and token frequency of actual usage but also by the cognitive salience of the concept encoded in the different lexical items. I have argued that new nouns take their gender based on the existing patterns between gender and other lexical properties (Conzett 2006). Similarly, the formation of new words is based on patterns found in the lexicon. New words created in this way can either gain the status of permanent lexical items or they remain occasional single formations.

When studying word-formation in a network model, we thus have to recognize two levels of analysis. On the one hand, there is the level of synchronic word structure, i.e., the internal structure of lexical items emerging from their connections with other items in the lexicon. On the other hand, there is the level of the diachronic process of creating new lexical items based on existing patterns in the lexicon. In other words, we have to distinguish between word-motivation and word-derivation (cf. Dokulil 1968: 219, Mel'čuk 1976: 290–291). From a synchronic point of view, the relationship between the English noun *freedom* and the adjective *free* can be described as (a) a partial segmental identity between the two, and (b) as the former being motivated by the latter, in the sense that the concept of FREEDOM is essentially based on the concept of FREE. In practice we can paraphrase the meaning of *freedom* with 'the state of being free'. A similar relationship is found between other pairs of lexemes like *boredom – bore* (n.) and *bumbledom – bumble* (n.). There are, thus, strong connections between the first elements in the nouns on the left side and the lexemes on the right side. On the other hand, there are strong relationships between the element *-dom* in the nouns on the left side. A schematic illustration of the relationships between these lexical items is given in Figure 1.
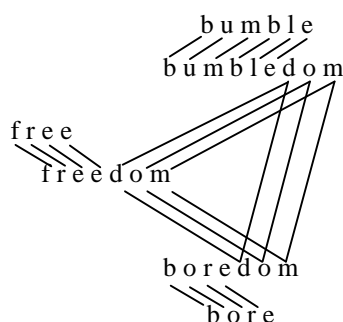
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                    b u m b l e
                    b u m b l e d o m

        f r e e
          f r e e d o m




                    b o r e d o m
                      b o r e
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Figure 1. Lexical network for English nouns in *-dom*

Figure 1 should not be misinterpreted by reducing the connections to only being valid between segmental elements. Connections in a lexical network are found between all kinds of properties of words. In the example above, there are also connections between the meaning of the involved words, their word class, gender, etc. But, of course, these connections can be of different strength. There are, for example, stronger connections between *bore* and *bumble* on the one hand and *free* on the other since the two words in the former pair both share the same word class, and they are also semantically more closely related. For practical reasons, these types of relatedness are difficult to depict graphically.

From this system of connections, the semantic word structure pattern emerges as paraphrased in 'X + *dom* = the state of being X'. New lexemes can thus be created based on this established pattern, e.g., *star – stardom* (n.), *yuppie – yuppiedom* (n.) (cf. Plag 2003: 88). From a diachronic point of view, we can say that *yuppiedom* was derived from *yuppie* by suffixing *-dom*. From a synchronic point of view, *yuppiedom* has an internal structure that is motivated by the noun *yuppie* and the connections emerging from the lexical network described above (cf. Tuggy 2005: 251–252).

2.2. Gender patterning

In languages with gender, the gender of nouns is included in the system of lexical connections just like other properties of lexical items. The gender pattern described in section 1.2. is analysed in basically the same way as outlined for the formation of English nouns in *-dom* above. The gender of a noun emerges from its connections to other nouns and to other co-

occurring lexical items that modify the noun, either in attributive or predicative position. The situation is illustrated with the Old Norse (ON) attributive modifiers in (5).

		(A)		(B)	
(5)	a.	*sá*	*grann-i*	*sú*	*grann-a*
		that-	neighbour-	that-	neighbour-
		MASC.SG.NOM	SG.NOM.	FEM.SG.NOM	SG.NOM
	b.	*grann-a*	*sín-um*	*grönn-u*	*sin-ni*
		neighbour-	his-	neighbour-	her-
		SG.DAT	MASC.SG.DAT	SG.DAT	FEM.SG.DAT
	c.	*grann-ar*	*tveir*	*grönn-ur*	*tvær*
		neighbour-	two-	neighbour-	two-
		PL.NOM	MASC.NOM	PL.NOM	FEM.NOM
	d.	*sá*	*vin-r*	*sú*	*vin-a*
		that-	friend-	that-	friend-
		MASC.SG.NOM	SG.NOM.	FEM.SG.NOM	SG.NOM
	e.	*vin*	*sín-um*	*vin-u*	*sin-ni*
		friend-	his-	friend-	her-
		SG.DAT	MASC.SG.DAT	SG.DAT	FEM.SG.DAT
	f.	*vin-ir*	*tveir*	*vin-ur*	*tvær*
		friend-	two-	friend-	two-
		PL.NOM	MASC.NOM	PL.NOM	FEM.NOM

In column (A) on the left, the nouns *granni* (M 'neighbour') and *vinr* (M 'friend') are modified by a demonstrative (a, d), reflexive possessive (b, e), and a numeral (c, f). In column (B) on the right, the nouns *granna* (F 'female neighbour') and *vina* (F 'female friend') are modified correspondingly. The gender of the nouns in (5), that is M in (A), and F in (B), is the pattern that emerges from the network of connections as depicted in Figure 2. As the illustration reveals, gender is an emergent pattern in a structured lexicon, and there is obviously no reason for why this pattern could not be involved in word-formation. In fact, the examples in Figure 2 can of course be analysed as a gender pattern. In (6) this gender pattern is described in a less cumbersome way.

(6)   M '(male) person'   :   F 'female person'

Gender patterns in modern Norwegian most likely confirm that the gender pattern in (6) at one stage served as template for gender patterning.
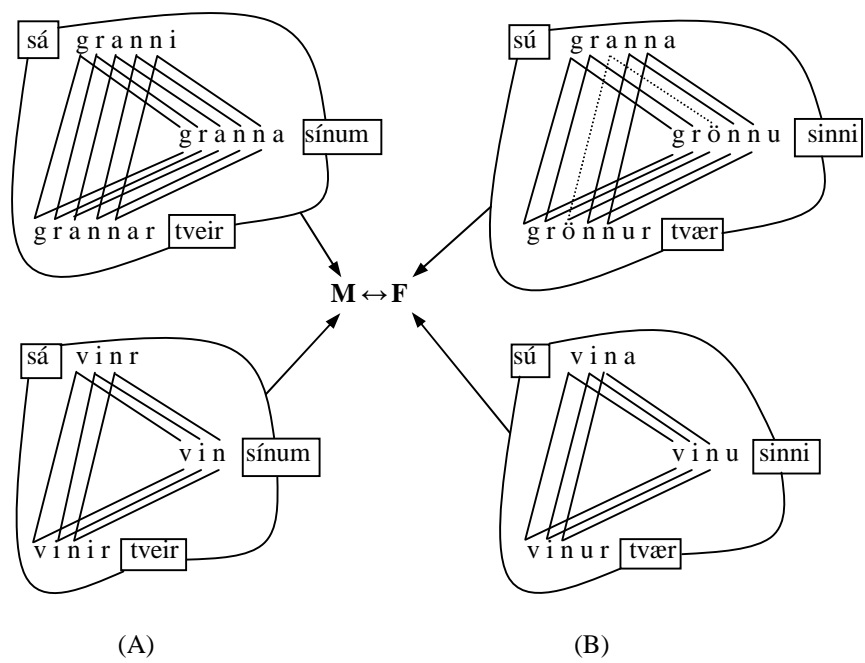
Figure 2. Lexical network for gender in Old Norse[3]

An illustrative candidate at hand is the noun pair *kokk* (M 'cook') − *kokke* (F 'female cook'). According to Bjorvand and Lindeman (2000: 471) *kokk* was borrowed from Middle Low German *kok*. Later, the new noun *kokke* was formed, most probably by the process of gender patterning based on *kokk*, as shown in Figure 3.[4]
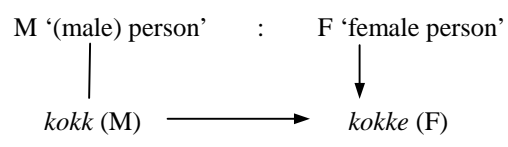

Figure 3. Gender patterning in Norwegian[5]

In the process of gender patterning, word-formation and gender assignment is carried out simultaneously. However, the network model presented above also copes with the assignment of gender to new nouns not estab-

lished by word-formation. Being integrated in the lexicon of Middle Norwegian, the loan word *kokk* was evidently also assigned its masculine gender. The primary template in this process was undoubtedly the highly entrenched pattern arising from the strong connections between M, and nouns denoting (male) persons. The two nouns in section (A) of Figure 2 may serve as examples of this pattern. At a lower level of generalization, we can also specify that the persons concerned in the template play an agentive role, and that the concept is not affectively loaded (cf. 3.2.1.). The conceptual structure of *kokk* is thus quite similar to that of other agentive nouns already existing in ON, for example, *bakari* (M 'baker' from *baka* v. 'bake') and *mælandi* (M 'spokesman' from *mæla* v. 'speak'). As a matter of fact, at a micro level, there is even a near-synonym to *kokk* in ON, namely *steikari* (M 'roaster, cook' from *steik(j)a* v. 'roast'). The gender assignment template used for the noun *kokk* is thus based on a highly prominent pattern at different levels of specification. The assignment process is depicted in Figure 4.[6]

'(male) person/agent/cook'   :   M

kokk ⟶ *kokk* (M)

Figure 4. Gender assignment in Norwegian

Gender assignment of new nouns created by word-formation other than gender patterning works essentially in the same way. From agentive nouns like *steikari* a pattern arises where the segment *-ar-* is associated with M. New formations based on this template receive accordingly M as their gender, as is reflected in modern Norwegian cognates like *lærar* (M 'teacher'), and *brukar* (M 'user').

From the discussion above, we can conclude that the proposed network model provides a unified account of both gender assignment and word-formation − be it segmental, as e.g., with suffixed words, or non-segmental, as e.g., with gender patterning.

2.3. Motivation vs. derivation

Most crucial for our understanding of a network approach to word-formation is the fact that we cannot always infer from the synchronic structure of a lexeme back to the diachronic word-formation process that actually created the lexeme. Since morphologically complex words are seen as complete lexical units and not just stems derived by some symbolic rules, they can be subject to change on an individual basis. We can illustrate this point with some examples of segmental word-formation in Norwegian. The nouns *ætting* ('kinsman'), *dronning* ('queen'), and *kjerring* ('old woman') are etymologically all derived by suffixation of *-(n)ing* to the following nouns: *ætt* ('family, lineage'), *drótt* ('[kings] bodyguard'), and *karl* ('man'). The ON cognates are *ættingi*, *dróttning*, and *kerling*. These words are still to be regarded as synchronically motivated by their original derivational bases. However, the root vowel in the noun **karling* has been *i*-mutated to *-e-* in Ancient Nordic. In ON the connections between *karl* and *kerl-* are thus already somewhat loosened. In the Middle Norwegian period both *dróttning* and *kerling* are subject to further sound changes finally resulting in the current forms. In addition, the noun *drótt* has not survived into modern Norwegian. There is a modern noun *drott* ('chief, king'), developed from ON *dróttinn*, but this word is nowadays archaic. The noun *dronning* on the contrary is still in common use, and so is *kjerring*. However, from a synchronic point of view, neither of these two words can be said to be perceived as motivated by some other lexical item as it was the case with their Ancient Nordic or ON cognates. The same is not true for *ætting* which can still be paraphrased by 'someone belonging to the same *ætt*'. The element *-ing* in this word is thus connected to the identical element in other nouns like *telemarking*, which can be paraphrased in a quite similar way ('someone who comes from the county of Telemark'). While *ætting* is still considered as a morphological complex noun, both *dronning* and *kjerring* are basically conceived as simplex nouns. The three nouns neatly show the distinction between synchronic motivation and diachronic derivation. Henceforth, words that synchronically motivate other words will be called *motivating* words (e.g., *free* as described above), whereas words that are motivated by other words will be called *motivated* words (e.g., *freedom*).

In the present study, word-formation is primarily approached from a synchronic perspective. Thus, a complete investigation of the etymological development of each noun in the data set has not been carried out. Nevertheless, in many cases the diachronic processes resulting in a synchronic

pattern is quite obvious from its structure. In other cases, it can be inferred on fairly safe grounds. Furthermore, by comparing two synchronic stages of Norwegian, we can gain additional insight into the topic. Such a comparison can reveal changes in the processes used in the formation of new words.

2.4. Data and methods

The analysis in this study is primarily based on data from Norwegian. Two diachronic stages of the language are investigated. The first stage is the system of ON, reaching from ca 700 to ca 1350. The other stage is represented by modern Norwegian, covering the time from about 1950 up to the present time. For both periods, I use standard dictionaries as data sources. The source for ON is Johan Fritzner's *Ordbog over Det gamle norske Sprog* (Fritzner 1973), and the modern Norwegian data is obtained from *Nynorskordboka* (NOB), representing the standard written language of *nynorsk* (NN).[7]

From these dictionaries all non-compound nouns found in gender patterns as described in (4a), are extracted. In addition, words belonging to other word classes than noun and which can be considered as motivating at least one of the nouns in a given gender set are also included in that gender set. The verb *skrape* ('scrape') is thus included in the gender pattern of *skrape* (F, 'scraper') – *skrap* (N, 'scraping sound') since both nouns are motivated by the verb. I will henceforth call the words included in a gender pattern *word set*. If reference is made only to the nouns included in a gender pattern, the term *noun set* will be used. Word sets containing nouns all of which have more or less the same meaning are excluded from further investigation.[8] Moreover, word sets including nouns listed with more than one gender in the source dictionaries are left out as well.[9] The remaining word sets make up the corpus for this study.

Finally, a few more words should be said on the notion of gender pattern. The gender of nouns is obviously also involved in segmental word-formation processes. As pointed out before (cf. note 2), German motion nouns in *-in* differ in addition to the suffix also in their gender from their male counterparts. In such cases, however, the role of gender is conflated with that of segmental elements. In order to eliminate other formal factors, the present study is limited to cases where gender is the only formal feature distinguishing between related nouns. In addition, the definition of gender pattern in (4a) allows related nouns optionally to differ in declension class

membership. This implies that related nouns may have different declensional affixes also in what is sometimes called their basic form. We already encountered such instances in (2), e.g., lat. *amic-us – amic-a*. Such declensional endings are also found in Norwegian. In ON they are quite prevalent. Declensional endings are in this work defined as coming in addition to a declensional stem. A declensional stem is a segmental element that remains identical within the whole declension paradigm. An element in addition to the declensional stem is accordingly a declensional ending. Both in ON and NN there are nouns without any ending in the basic form. In addition to these cases, there are five different segmental declensional endings in the basic form of ON nouns: *-r, -ir, {-l/-n/-s} -i*, and *-a*, whereas in NN there is only one additional ending: *-e*. Table 1 shows how these endings are distributed across gender and gives examples of nouns included in gender patterns. Some combinations of gender and inflectional ending are not found in gender patterns. In this case, another noun is given within brackets. If the combination of gender and inflectional ending is not available at all, the respective field is shaded.

Table 1. Basic form endings in Norwegian[10]

	ON						NN	
	-	**-r**	**-ir**	**-l/-n/-s**	**-i**	**-a**	**-**	**-e**
F	*simul*	*(elpt-r)*				*mál-a*	*rasp*	*bums-e*
M	*jarl*	*leik-r*	*fylk-ir*	*simul-l*	*mál-i*	*(herr-a)*	*søkk*	*bums-e*
N	*mál*				*fylk-i*	*leik-a*	*rasp*	*søkk-e*

3. Gender patterns in Norwegian

The ON part of the corpus contains a total of 394 nouns spread over 186 word sets. This means that 3.9% of all 10142 non-compound nouns in Fritzner (1973) are involved in gender patterns. In comparison, the fourth most common derivational suffix *-leik* is attested in 344 nouns. In the NN part of the corpus we find a total of 637 nouns spread over 310 word sets. This makes 2.8% of all 23079 non-compound nouns in NOB. The second most common derivational suffix in NN is *-skap*, which is attested in 293 nouns.[11] Table 2 shows how many noun sets there are in each of the four possible gender combinations.

In ON, the gender combination F/M is most frequently represented in gender patterns whereas, in NN, the combination M/N is slightly more frequent than F/M. Moreover, the general quantitative survey in Table 2 tells us that gender pattern is a more prevalent phenomenon in Norwegian than its non-treatment in the literature indicates. It is, hence, worth documenting this linguistic feature in depth. Such a description is the topic of the following main part of this chapter. The part is divided in three sections. In the first two sections, I discuss formal (3.1.) and semantic (3.2.) properties of the gender patterns in ON and NN. In section 3.3., the diachronic development between the two stages is described.

Table 2.   Quantitative distribution of noun sets

	ON					NN				
	F/M/N	**F/M**	**F/N**	**M/N**	**∑**	**F/M/N**	**F/M**	**F/N**	**M/N**	**∑**
#	22	97	23	44	186	17	107	64	122	310
%	11.83	52.15	12.37	23.66	100	5.48	34.52	20.65	39.35	100

3.1. Formal properties of gender patterns

3.1.1. The role of the declensional endings

The first formal property to be considered is the role of the inflectional endings involved in gender patterns. Ultimately, the issue boils down to the question of whether we actually have to deal with gender patterns (also involving inflection), or whether the phenomenon is rather to be accounted for as inflectional patterns (also involving gender). That gender is the primary factor in the phenomenon at hand is confirmed by the trivial fact that, within a number of observed coherent semantic patterns, the basic variation goes actually between gender and not between different declension classes. A transparent example is the field of sex-differentiation. As the examples in (7) clearly illustrate, there is variation between different declensional endings within each gender, but still, the general semantic patterns are consistent with the distinction between genders (cf. 3.2. for more details.). Semantic variation of this kind correlated to a systematic variation in declension class only is not attested in the source material of this study, and, to my knowledge, it has not been reported in other languages either.

	F = 'female'	M = 'male'	meaning
(7)	*vin-a*	*vin-r*	'friend'
	asn-a	*asn-i*	'donkey'
	simul	*simul-l*	'reindeer'

Nevertheless, declension class membership obviously plays a role in gender patterns since it is often reflected in the most salient form of the noun, which, in general, is the basic form in the declension paradigm. We are thus still left with the question of what is the status or function of the basic form declensional endings found in gender patterns in Norwegian.

Some of the basic form endings in ON are occasionally called gender markers. Steinmetz (1985, 2001) and Trosterud (2001) ascribe the status of gender marker to the endings *-r*, *-i* (both M), and *-a* (F). In Table 3 the combinations of gender and declensional endings in non-compound nouns in Norwegian are summarized, and their type-frequency is given.

Table 3. Type-frequency of basic form endings in Norwegian nouns[11]

		ON							NN		
		-	-r	-ir	-l/n/s	-i	-a	Σ	-	-e	Σ
#	F	2510	40	0	0	0	1422	3972	3086	1999	5085
	M	148	1985	88	223	1363	9	3816	11531	1709	13240
	N	1794	0	0	0	448	20	2262	3649	322	3971
	Σ	4452	2025	88	223	1811	1451	10050	18266	4030	22296
% (a)	F	56.38	1.98	0	0	0	98		16.89	49.6	
	M	3.32	98.02	100	100	75.26	0.62		63.13	42.41	
	N	40.3	0	0	0	24.74	1.38		19.98	7.99	
	Σ	100	100	100	100	100	100		100	100	
(b)	F	63.19	1.01	0	0	0	35.8	100	60.69	39.31	100
	M	3.88	52.02	2.31	5.84	35.72	0.24	100	87.09	12.91	100
	N	79.31	0	0	0	19.81	0.88	100	91.89	8.11	100

The absolute numbers (#) in Table 3 are analysed in two ways as percentages (%). Section (a) of the table shows in relative numbers how typical the different basic forms are in representing or marking a single gender. As can be seen from the ON data, it is true that *-r* and *-a* are closely connected with M and F respectively. Out of 2025 non-compound nouns with N.sg. in *-r*, 1985, i.e., 98.02%, are M, and only 40, i.e., 1.98%, are F. The numbers for *-a* are 1422 F (98%), 9 M (0.62%), and 20 N (1.38%). The picture for *-i*

is not as clear: 1363 M (75.26%), and 448 N (24.74%). Furthermore, N.sg. without any inflectional ending is found in F (#2510; 56.38%) and N (#1794; 40.3%) but much less so in M (#148; 3.32%). Actually, as was already obvious from Table 1, the only endings that are unambiguously tied to gender are *-ir*, which is found in 88 M, and the group of *-l/n/s*, which is attested in 223 M.[11] These are also the only endings exclusively identifying the declension class they belong to.

Based on the numbers in section (a) of Table 3, the different declensional endings in ON are placed on a scale in Figure 5, according to how typically they mark a given gender. The scale ranges from 100, meaning perfect gender marker, to 0, signifying that the ending is not found with that gender at all.

```
100 ------------------------------------ 50 -------------------------------------- 0
        F/-a                    F/-                              F/-r
M/-ir   M/-r          M/-i                                  M/-   M/-a
M/-{l,n,s}                              N/-        N/-i           N/-a
```
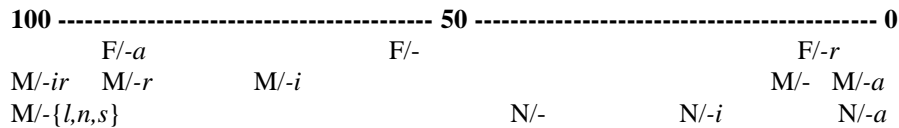
Figure 5. Typicality of ON basic form endings in representing gender (t1)

M/- is untypical in the sense of very low type-frequency (3.32%). The combination M/- is only found in three F/M noun sets. In all these noun sets F has the prototypical F-ending *-a*: *franzeisa* (F 'French') – *franzeis* (M 'Frenchman'), *hasla* (F 'hazel rod') – *hasl* (M 'hazel'), *jarla* (F 'earl's wife') – *jarl* (M 'earl'). The combination F/-a is typical in the sense of very high type-frequency (98%). The average type-frequency of the combination F/-a + M/- is thus (3.32+98) / 2 = 51. This somewhat abstract number is here used to indicate how typically the declensional endings of the nouns included in a gender pattern mark their gender. Table 4 gives an overview of all 23 combinations of declensional endings found in ON gender patterns, including the number of instances (#), the average typicality of the declensional endings as gender markers (t1), and examples of noun sets.

Nearly all noun sets have a t1-value higher than 50. Most of the numerously attested noun sets include at least one noun with an ending which is particularly typical for its gender. This is the case in the combinations F/-a + M/-r, F/-a + M/-i, F/-a + N/-, and F/- + M/-r. The second most numerous combination is M/-i + N/-, despite of its t1-value being lower than in the

former examples. But still, given the combination of M and N, the declensional pair -/-*i*, e.g., would have resulted in a much lower t1-value (=13).

Some combinations scoring high on the t1-scale are only sparsely attested. This holds, e.g., for the noun sets including M/-*ir* and M/-*l/n/s*. This fact is apparently related to the typicality of these declensional endings within the respective genders. Section (b) in Table 3 tells us in relative numbers how typical a basic form ending is *within* a given gender. To illustrate the difference to the typicality described in the previous section, we can take the declensional ending -*ir* as an example.

Table 4. Combinations of declensional endings in ON gender patterns

F	M	N	#	t1	t2	t	example	F	M	N	#	t1	t2	t	example
-a	-		3	51	20	35	*jarla-jarl*	-	-l		2	78	35	56	*simul-simull*
-a	-r	-a	1	66	30	48	*leika-leikr-leika*	-	-ir	-i	1	60	28	44	*sætt-sættir-sætti*
-a	-r	-	5	79	56	67	*hapta-haptr-hapt*	-	-ir		2	78	33	55	*reim-reimir*
-a	-r		31	98	44	71	*vina-vinr*	-	-i		4	66	49	58	*slóð-slóði*
-a	-i	-	13	71	50	61	*nafna-nafni-nafn*	-		-i	2	41	42	41	*smíð-smíði*
-a	-i		21	87	36	61	*asna-asni*	-		-	3	48	71	60	*sin-sin*
-a	-ir	-i	1	74	19	47	*deila-deilir-deili*		-r	-i	1	61	36	48	*kippr-kippi*
-a	-ir		7	99	19	59	*fella-fellir*		-r	-	8	69	66	67	*skrapr-skrap*
-a	-n		1	99	21	60	*teina-teinn*		-ir	-i	3	62	11	37	*fylkir-fylki*
-a		-	18	69	58	63	*blaka-blak*		-i	-i	2	50	28	39	*gildi-gildi*
-	-r	-	1	65	65	65	*lim-limr-lim*		-i	-	30	58	58	58	*kaupi-kaup*
-	-r		26	77	58	67	*ljá-ljár*								

This ending is a perfect gender marker since it is the only ending used with M. However, it is far from typical within M. According to section (b) in Table 3 only 2.31% of all non-compound M end in -*ir* in N.sg. We could thus say that the typicality of -*ir* within M is 2.31. This fact should be taken into consideration when analysing the quantitative distribution of declensional endings in gender patterns. In Figure 6 the different declensional endings of ON are placed on a scale according to how typical (in the sense of relative type frequency) they are within a given gender. The scale ranges from 100, meaning the only ending found with that gender, to 0, meaning not found at all with that gender.
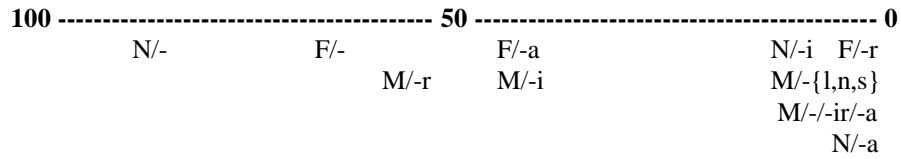
```
100 --------------------------------------- 50 -------------------------------------------- 0
       N/-                 F/-               F/-a                  N/-i   F/-r
                          M/-r               M/-i                  M/-{l,n,s}
                                                                   M/-/-ir/-a
                                                                   N/-a
```

Figure 6. Typicality of ON basic form endings within gender (t2)

In the same way as we calculated average t1-values, we can treat the typicality of basic form endings within gender. The average typicality in the combination F/-*a* + M/-*ir* is thus (35.8+2.31)/2 = 19. In Table 4 these average values of typicality are listed as t2. For the sake of convenience, the average of t1 and t2 is given in t. The combination of t1 and t2 provides a quantified account for how the distribution of the declensional endings in gender patterns is related to the relative type-frequency of the same elements in the whole noun system. Relative type-frequency can of course not explain the exact distribution of declensional endings in gender patterns. However, relative type-frequency does give us a reasonable account for why some combinations are found quite numerously whereas certain other combinations seem to be avoided.

The descriptive usefulness of relative type-frequency becomes most clear when we look at ON declensional endings which are compatible with more than one gender.[12] From Table 1, we remember that the basic form ending -*a* is found in all genders: *mál-a* (F) – *herr-a* (M) – *leik-a* (N). The ending -*i* is attested with M (*mál-i*) and N (*fylk-i*). The basic form in -*r* is found in both F (*elpt-r*) and M (*leik-r*), whereas the basic form without any declensional ending is found in all genders: *simul* (F) – *jarl* (M) *mál* (N). As discussed above, such endings differ, however, in how typical they are in identifying a given gender (t1), as well as in how typical they are within a given gender (t2). If we compare combinations of two genders at once, we can point out which declensional endings are most typical for each gender. In Figure 7 these endings are in bold type.

F	**M**		**F**	**N**		**M**	**N**
-a	*-r*		*-a*	*-*		*-i*	*-*
-	*-*		*-*	*-a*		*-*	*-i*
-r	*-a*					*-a*	*-a*

Figure 7. Typicality of ON declensional endings for gender combinations

Given the combination F/M and the declensional endings –*a*, -*r*, and -, all combinations including both F/{-*a*,-} and M/-*r* clearly distinguish the two genders formally. Given the combination M/N and the endings -*a*, -*i*, and -, the combination M/-*i* + N/- marks the two genders most typically. The situation within the F/N combination is somewhat uncertain. There is no doubt about -*a* being a more typical ending for F than N. Actually, the possibility of no ending at all is also more type-frequent with F than with N. However, given the combination F/N, a basic form with no ending is the most preferable choice for N since the two other alternatives (-*a*, -*i*) score much lower both on the t1- and the t2-scale. This would suggest that given the combination F/N and the endings -*a*, -, the combination F/-*a* + N/- distinguishes the two genders most clearly. However, since a basic form without any ending is typical for F, too, the combination F/- + N/- seems in principle to be well-formed as well.

In Table 5 all logically possible gender patterns including the declensional endings discussed above are compared in pairs with respect to t1 and t2 (represented by their average t). The combinations are sorted from most typical on the top to least typical at the bottom.

Table 5. Combinations of ON declensional endings compatible with more than one gender

F	M	t	#	F	N	t	#	M	N	t	#
-*a*	-*r*	71	31	-*a*	-	63	18	-*i*	-	58	30
-	-*r*	67	26	-	-	60	3	-*i*	-*i*	39	2
-*r*	-*r*	38	0	-*a*	-*a*	34	0	-	-	32	0
-*a*	-	35	3	-	-*a*	30	0	-*a*	-	30	0
-*a*	-*a*	34	0					-*i*	-*a*	28	0
-	-	32	0					-	-*i*	13	0
-	-*a*	30	0					-*a*	-*i*	11	0
-*r*	-	3	0					-	-*a*	2	0
-*r*	-*a*	1	0					-*a*	-*a*	1	0

▓▓▓ =preferable   ▒▒▒ =less/not preferable   ☐ =avoidable

As is indicated with different background shadings, the combinations of declensional endings for each gender pattern can be divided into two or three groups as to how typical they are in principle. First, there is a top group consisting of combinations that are preferable. Then, there is an intermediate group with little preferable combinations. And finally, at the

bottom, there is a group of combinations that could be best classified as avoidable. Only two levels can be distinguished for F/N combinations. Nonetheless, as the numbers of attestations indicate (in column #), the distribution of these declensional endings in actual gender patterns can be said to reflect to a high degree the principle ranking of the logically possible combinations based on relative type-frequency.

Based on the discussion above, the role of declensional endings in gender patterns in ON can be summarized as follows. Apart from the infrequent *-ir* and *-l/n/s*, there are no basic form declensional endings that mark gender exclusively. However, as the analysis in this section demonstrated, the declensional endings attested in gender patterns are by and large distributed in a way that reinforces the very same gender patterns in the sense that combinations of endings that distinguish more clearly between genders are preferred to endings that do less so.

As shown in Table 1, the situation between declensional endings and gender is quite different in NN. At this modern stage of the language, there are still three genders, but they all share the same set of two possible basic declensional endings *-e* and no ending (-). This simpler system is the result of apocope and vowel reduction during the Middle Norwegian period. The ON endings *-r* and *-l/n/s* disappear, and the unstressed vowel endings *-a* and *-i* are reduced to *-e* (pronounced as [ə]) (cf., among others, Beito 1986: 63–66, 84–85). Parallel to the discussion of ON, we can analyse these endings with respect to how typically they mark a given gender (t1), and how typical they are within a given gender (t2). The rightmost part of Table 3 provides us with the necessary numbers of the relative type-frequency for the different endings. In the table, section (a) covers t1 whereas section (b) is about t2. Based on the numbers for the two types of typicality, the declensional endings are placed on the scales in Figure 8 and Figure 9. On the scale in Figure 8, the endings are ranked according to their t1-value, and on the scale in Figure 9 the ranking reflects the t2-value of the endings.
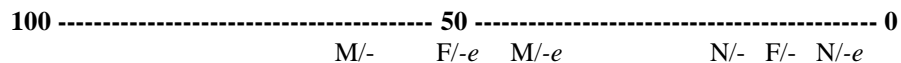
100 -- **50** --- **0**

M/-   F/-*e*   M/-*e*   N/-   F/-   N/-*e*

Figure 8. Typicality of NN basic form endings in representing gender (t1)

100 -------------------------------------- **50** --- **0**
      M/-   F/-   F/-*e*   M/-*e*
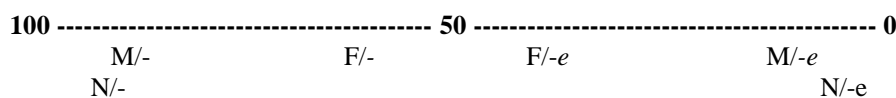   N/-   N/-e

Figure 9. Typicality of NN basic form endings within gender (t2)

None of the declensional endings in NN distinguishes between the three genders in the same clear manner as is the case for several endings in ON. As Figure 8 shows, the basic form without any declensional ending is most typically an indication of M. At the same time, this basic form alternative is also the most typical within M (cf. Figure 9). Second most typically, basic form without any ending points to N, and it is also by far most typical within N. The ending -*e* is most typically associated with F. However, because masculine nouns on the whole are by far the most type-frequent, there is a substantial part of M ending in -*e*, too. On the other hand, the ending -*e* is much more marginally tied to N. Table 6 gives an overview of all 17 combinations of declensional endings found in NN gender patterns, including the number of instances (#), the t1- and t2-values, as well as their average t, and examples of nouns sets.

Table 6.   Combinations of declensional endings in NN gender patterns

F	M	N	#	t1	t2	t	example	F	M	N	#	t1	t2	t	example
-e	-e	-e	1	33	20	27	*sete-sete-sete*	-	-	-	1	33	80	57	*saks-saks-saks*
-e	-e	-	2	37	48	43	*brote-brote-brot*	-	-		48	40	74	57	*sveiv-sveiv*
-e	-e		10	46	26	36	*bumse-bumse*	-		-e	3	12	34	23	*vette-vett*
-e	-	-e	1	40	45	43	*kverve-kverv-kverve*	-		-	8	18	76	47	*rasp-rasp*
-e	-	-	12	44	73	59	*vime-vim-vim*		-e	-e	1	25	11	18	*gode-gode*
-e	-		47	56	63	60	*katte-katt*		-e	-	12	31	52	42	*hoste-host*
-e		-e	5	29	24	27	*gifte-gifte*		-	-e	3	36	48	42	*kipp-kippe*
-e		-	48	35	66	51	*krafse-krafs*		-	-	106	42	89	66	*drøl-drøl*
-	-e		2	30	37	34	*mjølk-mjølke*								

The most numerously attested combinations of gender and basic form ending consist all of only two nouns, and they have all a t-value higher than 50: F/-*e* + M/-, F/-*e* + N/-, F/- + M/-, and M/- + N/-. There are also two other combinations with a t-value above 50, but these consist both of three nouns: F/-*e* + M/- + N/-, and F/- + M/- + N/-. As with the ON data, let us discuss the issue of typicality separately for each gender pair. Recalling the

figures for relative type-frequency displayed in Table 3 and graphically represented in Figure 8, we can compare the declensional endings in each gender pair as to how typically they mark the respective gender. This is done in Figure 10 where the most typical declensional ending for each gender is in bold type.

F	M		F	N		M	N
-e	**-**		*-e*	**-**		**-**	**-**
-	*-e*		-	*-e*		*-e*	*-e*

Figure 10. Typicality of NN declensional ending for gender combinations

Given the combination F/M and the declensional endings -*e*, -, the combination F/-*e* + M/- marks the two genders most typically. For F/N, the combination F/-*e* + N/- distinguishes the two genders most clearly. For gender pairs in M/N, basic form without any ending actually points out M more typically. However, as Figure 9 illustrates, given that the gender pair involves N, basic form without any ending is much more preferable for N than the other alternative, -*e*. Thus, referring to both t1 and t2, the combination M/- + N/- reflects the gender pair M/N most typically. In Table 7, all gender patterns in NN are compared in pairs with respect to t1 and t2 (represented by their average t). The combinations are sorted from most typical on the top to least typical at the bottom.

Table 7. Combinations of NN declensional endings

F	M	t	#	F	N	t	#	M	N	t	#
-	-	57	48	*-e*	-	51	48	-	-	66	106
-e	-	60	47	-	-	47	8	*-e*	-	42	12
-e	*-e*	36	10	*-e*	*e*	27	5	-	*-e*	42	3
-	*-e*	34	2	-	*-e*	23	3	*-e*	*-e*	18	1

▓ =preferable   ☐ =less/not preferable

As the shading in the table indicates, the combinations of declensional endings within each gender pattern can be divided into two groups as to how typical they are with respect to t1 and t2. The combinations in the shaded top group are preferable. The remaining combinations, placed in the unshaded bottom group, are less or not preferable. The combinations in

the top group are basically identical with the shaded ones in Figure 10, except for the pair F/- + M/-. The reason for this seems to lie in the typicality of F/-. Although it is *-e* that identifies F most typically (in fact only slightly more typically than it does M), it is still "no ending" that is the most typical ending within F. This means that in a given combination set F/M, all combinations including F/- seem to work well. The numbers of attestations in the #-column confirm to a large extent the ranking of the declensional endings based on relative type-frequency. In a perspective of type-frequency, the most numerously attested combinations are classified as most preferable. Again, the situation for F/M may appear somewhat deviant. Here, the combination -/- is actually found in one more instance than *-e*/-. This is due to the many suffix-derivations in *-ing*, which do not have any declensional ending in either F or M.

The discussion in this section about the distribution of basic form declensional endings in Norwegian has shown a strong tendency of these endings to formally reinforce the gender patterns found in this language.

3.1.2. The morphological structure of the noun stems

In our discussion of the formal properties of the gender patterns in Norwegian, we now move from the declensional endings to the declensional stems. The trivial but crucial fact to be recalled about declensional endings is that they are not part of the noun stem. However, the noun stems involved in the Norwegian gender patterns do not all have the same morphological structure. One possible stem structure type, which was excluded at the outset of this study, are compounds. If such cases are indeed recorded in the source dictionaries, their last element is part of the corpus used here. The quantitative distribution of the remaining stem types is summarized in Table 8, and examples from ON and NN are given in (8).

As the results show, the noun stem in the attested gender patterns most typically consists of one root (a), both in ON and NN. In ON, out of the 394 nouns involved in gender patterns, 294, i.e., 74%, have one root as their stem. In NN, out of the 637 nouns found in gender patterns, 527, i.e., 83%, have a stem consisting of one root. Second most typically, the nouns in gender patterns have a stem consisting of one root and a suffix (c). In ON gender patterns, 48, i.e., 12%, of the nouns have this morphological structure. The same stem structure exists in 98, i.e., 15%, of the nouns involved in NN gender patterns.

Table 8. Morphological structure of the noun stems in gender patterns

			(a) root	**(b)** root+root	**(c)** root+suffix	**(d)** root+root+suffix	$\sum$
ON	**#**	**word sets**	136	21	24	5	186
		nouns	294	42	48	10	394
	%	**word sets**	73.12	11.29	12.9	2.69	100
		nouns	74.62	10.66	12.18	2.54	100
NN	**#**	**word sets**	255	0	49	6	310
		nouns	527	0	98	12	637
	%	**word sets**	82.26	0	15.81	1.94	100
		nouns	82.73	0	15.38	1.88	100

Noun stems consisting of two roots (b) are third most typical in ON gender patterns. This structure type is found in 42, i.e., 11%, of the nouns in gender patterns.[13] In NN, this structure type is not found among the nouns in gender patterns. Finally, the noun stem in some few nouns consists of the sequence root + root + suffix (d). In ON gender patterns, we find this type in only ten nouns.[14] The same stem structure is attested in twelve nouns in NN gender patterns.

		F	M
(8)	ON	a. *grann-a* ('female neighbour')	*grann-i* ('neighbour')
		b. *leið+sag-a* ('guiding')	*leið+sag-i* ('guide')
		c. *ginn+ing* ('fooling')	*ginn+ing-r* ('fool')
		d. *arf+ræn+ing*	*arf+ræn+ing-r*
		('robbery (F) vs. robber (M) of someone's inheritance')	
	NN	a. *bjørn-e* ('female bear')	*bjørn* ('bear')
		b. -	-
		c. *lur+ing* ('sneaking')	*lur+ing* ('sneak')
		d. *fram+fus+ing* ('gushing')	*fram+fus+ing* ('eager person')

Stem structure type (a) seems to be most widespread in the gender patterns of other languages as well. Types (b) and (d), however, have, to my knowledge, not been found in other languages. Stem structure type (c) is extensively found in Italian gender patterns. In this language, most of the animate nouns of the stem type root + suffix form gender pairs, where F denotes 'female X' and M 'male X'. Some examples are given in (9) (Schwarze 1988: 439–441, 447–454, 464–467).

	F = 'female'	M = 'male'	meaning
(9)	*benzin+ai-a*	*benzin+ai-o*	'filling station attendant'
	bibliotec+ari-a	*bibliotec+ari-o*	'librarian'
	post+in-a	*post+in-o*	'postman'

The only Norwegian gender pattern with nouns of stem type (c) distinguishing between female and male, is the ON pair *unn+ast-a* (F) vs. *unn+ast-i* (M) ('lover'). The semantic distinction between the nouns of stem type (c) in the other gender patterns goes most typically between abstract and concrete, both in ON and NN, as exemplified in (8d).

Summarizing the examination of stem structure, another interesting formal property of gender patterns can be identified. Although most extensively attested in root nouns, gender patterns also combine with morphologically complex nouns, suffix-nouns in particular. The word-formation process leading to such complex gender patterns involves thus also the segmental process of suffixation. In (8c) above, for example, the segment -*ing* is associated with both F and M, thereby sanctioning the formation of two lexical items from the same base, i.e., the verb *ginna* ('fool'). Both -*ing* as well as F and M arise as patterns in the lexical network, and these patterns are jointly exploited as a word-formation device.

3.1.3. The manner of relatedness of the nouns

The third formal property of gender patterns in Norwegian concerns the manner in which the involved nouns are related to each other. Here a division into two main types is suggested: direct vs. indirect relatedness. Nouns can be said to be directly related to each other if there is a primary motivation between them. Some examples are given in (10):

		N	M
(10) ON	a.	*land* ('country')	*land-i* ('countryman')
NN	b.	*ragg* ('shag')	*ragg-e* ('sock made of shag')

Most of the time, the directionality of the motivation between two nouns is apparent (cf. [10]). In such cases, the word-formation process resulting in the gender pattern can be assumed to be a direct one as well. This means that direct gender patterns with a directional motivation most probably are the result of conversion from one noun into the other(s) by changing its

gender. We could call this process *gender conversion* and illustrate it in Figure 11.[15]

ON   *land* | - N
               | ↓
      land | -*i* M

NN   *ragg* | - N
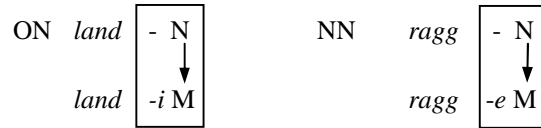 | ↓
      ragg | -*e* M

Figure 11. Gender conversion in Norwegian

On the other hand, if the relatedness between two nouns in a gender pattern is indirect, none of them is primarily motivated by the other. Examples of this type of relatedness are given in (11).

   As can be seen from the examples, gender pattern nouns can be indirectly related in different ways. In gender patterns of type a, b, d, and e, the two nouns on the right side are related through another lexical item that is also part of the word set. Both nouns are primarily motivated by this other word, which is typically a verb and less frequently an adjective. The two nouns in (f) have also the verb on the left as their motivation source, but the immediate motivation base for the masculine noun should rather be sought in the adjective *lur*, which itself is motived by the verb. Two gender pattern nouns can also be indirectly related as illustrated in (g). Also in this case, the two nouns are related through a third word in the set, e.g., the verb in (g). The interesting relation between the items in this gender pattern is that the noun on the left side motivates the verb, which, in turn, motivates the noun on the right. Finally, as example (c) shows, there may exist a combination of the two manners of relatedness in one and the same noun set. This gender pattern is characterized by the fact that the nouns on the right side are indirectly related to each other in the same way as described above for a, b, d, and e. Furthermore, each of these two nouns are directly related to the noun on the left side, which is their common motivating base.

   It is quite obvious that these indirect gender patterns cannot be the result of a single word-formation process. Apart from (f) and (g), all gender relations exemplified in (11) could in principle have been brought about by two parallel conversion processes. The nouns *skrap* (N) and *skrapr* (M) are thus converted from the verb *skrapa* in parallel. Chronologically, one of the conversions could have taken place after the other.

(11) ON   a. *skrap-a* (v. 'chatter') ⟶ *skrap-r* (M 'chatterbox')
                                        ↘ *skrap* (N 'chattering')

        b. *rauð-r* (adj. 'red') ⟶ *rauð-a* (F 'redness')
                                  ↘ *rauð-i* (M '(iron) ore')

        c. *nafn* (N 'name') ⟶ *nafn-a* (F 'female namesake')
                              ↘ *nafn-i* (M 'male namesake')

   NN   d. *pirk-e* (v. 'niggle') ⟶ *pirk* (M 'niggling person')
                                   ↘ *pirk* (N 'niggling')

        e. *tjukk* (adj. 'thick') ⟶ *tjukk-e* (F 'thick air')
                                   ↘ *tjukk-e* (M 'thickness')

        f. *lur-e* (v. 'sneak') ⟶ *lur+ing* (F 'sneaking')
           ↓
           lur (adj. 'sneaky') ⟶ *lur+ing* (M 'sneak')

        g. *rasp* (F 'rasp') ⟶ *rasp-e* (v. 'rasp')
                                        ↓
                                  rasp (N 'rasp, rasping')

The gender pattern exemplified in (g) is principally only possible as the result of two sequential conversion processes, first from *rasp* (F) to *raspe* (v.), and then from *raspe* (v.) to *rasp* (N). Both types of processes leading to indirect gender patterns can be labelled as *indirect gender patterning*.

    From a synchronic point of view, the manner of relatedness within noun sets is in some cases ambiguous or unclear. Sometimes it is almost impossible to find out whether nouns in a gender pattern are related directly or only indirectly. In NN, for example, the noun *slurv* (M 'careless person') is motivated by the adjective *slurven* ('careless'). The same stem is also found in the feminine noun *slurve* (F 'careless woman'). Is this noun primarily motivated by *slurv*, or, like *slurv*, by the adjective itself? Another peculiar example from NN is the pair *politi* (N 'police') – *politi* (M 'police officer'). Is *politi* (M) directly motivated by *politi* (N), or is it primarily related to a compound like *politi+mann* ('policeman')? In the second case, the indirect gender patterning leading to this gender pair is probably best described as a sequence of compounding: *politi+mann*, and then shortening: *politi*(*mann*). In the first case, simple gender conversion (*politi* N à M) can account for the origin of the gender pattern. In some gender patterns with directly related nouns, it can be hard to tell the directionality of the motivation between the two nouns. Pairs like ON *simul* (F) – *simull* (M) ('female vs. male reindeer') seem to be genuinely bidirectional (cf. 3.2.1.).[16]

The discussion in this section has highlighted two essential characteristics of the role of gender in the formation of Norwegian nouns. First, new nouns can be created by taking the stem of an existing noun and assigning another gender to it. This process was named gender conversion above. Second, the fact that Norwegian nouns are specified for gender, provides the possibility of indirect gender patterning in the different versions described above.

3.2. Semantic properties of gender patterns

Having discussed some of the formal aspects of gender patterns, it is time to take a closer look at their semantic features. The aim is to reveal some of the more prominent clusters of semantic distinctions emerging in gender patterns.

3.2.1. Animacy, sex-differentiation, and affective meaning

The probably most coherent semantic fields are found in the domain of animacy. Table 9 summarizes the quantitative relationship between the gender of the animate nouns in the Norwegian gender patterns and the biological sex they denote. Both in ON and NN there is a close correlation between gender and biological sex. Nouns referring to male animates as well as such unspecified for sex are M, whereas female animates are denoted by F. Out of the 45 male animates in ON gender patterns, only one, i.e., *fífl* ('fool'), is N, the remaining 44 are M. All 30 nouns standing for females are F. In total, 50 animate nouns are unspecified for biological sex. The vast majority of these, i.e., 45, is M. A similar situation can be found in NN. All 17 male animates are referred to by M, whereas female animates are exclusively associated with F. With 95 items, M also clearly dominates the group of 114 sex-unspecified nouns. Moreover, the gender patterns described in Table 9 fall into two groups.

Table 9. Quantitative relationship between gender and biological sex

	ON				NN			
	male	**female**	**unspec.**	**∑**	**male**	**female**	**unspec.**	**∑**
F	0	30	2	32	0	39	5	44
M	44	0	45	89	17	0	95	112
N	1	0	3	4	0	0	14	14
∑	45	30	50	125	17	39	114	170

First, if there is only one animate noun in a noun set, it is most typically M, and denotes a male animate or an animate unspecified for biological sex. In ON, the male animates in this group make up 19 words, while those unspecified for biological sex, count 42 instances. Some of these animates are directly motivated by the/another noun in the noun set. A *faxi* (M 'horse'), e.g., is an animal with a *fax* (N 'mane'), a *skeggi* (M) is a man with a *skegg* (N 'beard'), a *frauðr* (M 'frog') is an animal with *frauð* (N 'foam') around its mouth etc. The semantic relation between the motivating and motivated nouns in these pairs is based on metonymy (cf. 3.2.2. below). The major part of the animate nouns are agent nouns, motivated by a verb in the noun set. A *kaupi* (M 'buyer' from *kaupa* v.) can thus be paraphrased as 'someone who buys things', a *skrapr* (M 'chatterbox' from *skrapa* v.) is 'someone who chatters a lot', and a *sviki* (M 'betrayer' from *svíkja* v.) is 'someone who betrays (*svíkja* v.)', etc. The overall quantitative picture in NN is quite similar. Here, only six M stand for male animates while there are 74 masculine animates that are unspecified for biological sex. Most typically, such animates are motivated by a verb or adjective, e.g., a *brask* (M 'showoff') is 'someone who shows off (*braske seg*, v.)'.

Second, if there are two or more animates in one noun set, F and M typically have the function of sex-differentiation, i.e., F denotes female, and M either male or unspecified biological sex. From a synchronic point of view, we can distinguish between two main types of sex-differentiation: symmetric vs. asymmetric. In the former type the two involved concepts are all equal apart from the feature of biological sex. None of the two concepts can be said to be more primary than the other. In ON we find 20 cases of symmetric sex-differentiating gender patterns. They are listed in Table 10.

Table 10. Symmetric sex-differentiation in ON gender patterns

	base		F	M	base		F	M
(a)	*arfr*	M	*arfa*	*arfi*	*makr*	adj.	*maka*	*maki*
	fífla	v.	*fífla*	*fífli*	*mál*	N	*mála*	*máli*
	fóstra	v.	*fóstra*	*fóstri*	*nafn*	N	*nafna*	*nafni*
	hepta	v.	*hapta*	*haptr*	*bróðir*	M	*næstabræðra*	*næstabræðri*
	hóra	v.	*hóra*	*hórr*	*púsa*	v.	*púsa*	*púsi*
	búa	v.	*íbúa*	*íbúi*	*rún*	F	*rúna*	*rúni*
	aldr	M	*jafnaldra*	*jafnaldri*	*unna*	v.	*unnasta*	*unnasti*
	kærr	adj.	*kæra*	*kæri*				
(b)			*asna*	*asni*			*simul*	*simull*
			granna	*granni*			*vina*	*vinr*
			kvíga	*kvígr*				

Each of the 15 noun sets in section (a) of the table is motivated by a common base.[17] For instance, the nouns in the pair *arfa* (F 'inheritress') – *arfi* (M 'inheritor') are both motivated by the masculine noun *arfr* ('inheritance'). Some of the examples are rather complementary than equal in their conceptual structure. This is, for example, true for the pair *hóra* (F 'whore') – *hórr* (M 'adulterer'). It also has been noted that real symmetry in the realm of sex-differentiation is very seldom in the languages of the world (cf. Doleschal 1992). Most often the female part is overtly derived from its male counterpart by segmental derivation. Although the basic meaning of the nouns in Table 10 are in dictionaries recorded as 'female X' vs. 'male X', as Schwarze (1988: 454) points out for Italian, the specification of the biological sex in the masculine forms is as a rule unmarked, since, when reference is made to a group of X consisting of both males and females, the masculine form is used. However, the concepts coded in the feminine nouns in Table 10 cannot be said to hinge upon their masculine counterparts.

The five gender noun pairs in table section (b) do not have any "external" motivating word. It is not quite clear how these pairs have arisen. Apart from direct gender conversion, most probably from M to F, there is also the possibility of parallel creation from an obsolete base at the time of ON. In any case, from a synchronic point of view, at least two of the pairs seem indeed to represent genuine examples of symmetric sex-differentiation: *kvíga* (F 'heifer') – *kvígr* (M 'young bull'), as well as *simul* (F 'female reindeer') – *simull* (M 'male reindeer'). Interestingly, both pairs

have a superordinate term for generic use, *kýr* (F 'cow') and *hreinn* (M 'reindeer').

Symmetric sex-differentiation is somewhat less common in NN. As shown in Table 11, only about half as many instances as in ON are attested in the NN data. Maybe most striking about the examples is the fact that only the noun pair *fostre* (F 'foster-mother') – *fostre* (M 'foster-father') has no affectively loaded meaning. Basically all referents denoted by the remaining nouns in the table could be referred to by a more neutral, non-judging term. Instead of *sjuske* (F 'shabby women'), for example, the noun *kvinne* (F 'women') could be used.

Table 11. Symmetric sex-differentiation in NN gender patterns

	base		F	M	base		F	M
(a)	*bumse*	v.	*bumse*	*bumse*	*lurvet*	adj.	*lurve*	*lurv*
	fostre	v.	*foster*	*fostre*	*rulte*	v.	*rulte*	*rult*
	grebben	adj.	*grebe*	*grebb*	*sjusket*	adj.	*sjuske*	*sjusk*
	jålet	adj.	*jåle*	*jål(e)*				
(b)			*busse*	*busse*			*furke*	*furk*

In ON there are only three clear-cut examples of asymmetric sex-differentiation, cf. (10). The concepts on the right side in (10) are clearly semantically primary. One cannot have the concept of EARL'S WIFE without the concept of EARL.

(10) *hertoga* (F 'duchess, duke's wife')   - *hertogi* (M 'duke')
     jarla (F 'earl's wife')   - *jarl* (M 'earl')
     fyla (F 'female foal')   - *fyl* (N 'foal')

In NN there are more instances of asymmetric sex-differentiation. They are summarized in Table 12. The gender patterns in Table 12 are asymmetric because M in these sets is unspecified for biological sex whereas F explicitly denotes a female animate.

Table 12. Asymmetric sex-differentiation in NN gender patterns

base		F	M	base		F	M
=M		*bjørne*	*bjørn*	*skrullet*	adj.	*skrulle*	*skrull*
geipe	v.	*geipe*	*geip*	*slabbe*	v.	*slabbe*	*slabb*
=M		*katte*	*katt*	*slubbe*	v.	*slubbe*	*slubb*
=M		*kokke*	*kokk*	*slumset*	adj.	*slumse*	*slums*
lubben	adj.	*lubbe*	*lubb*	*slurven*	adj.	*slurve*	*slurv*
=M		*reve*	*rev*	*subbet*	adj.	*subbe*	*subb*
rugge	v.	*rugge*	*rugg*	=M		*tusse*	*tuss*
sabbe	v.	*sabbe*	*sabb*	=M		*ulve*	*ulv*

Apart from *bjørn-* ('bear'), *katt-* ('cat'), *rev-* ('fox'), and *ulv-* ('wolf'), all the nouns in Table 12 have affective meaning. We already encountered this characteristic in nouns that appear as the only animate in noun sets. The peculiar thing about these affective concepts is that they can be placed to both a motivating verb and adjective in a number of cases. This situation is exemplified in Figure 12 with the gender pattern formed on the root *smisk-*. Thus, the meaning of the masculine noun *smisk* can be paraphrased as 'someone who flatters (*smiske* v.) a lot', as well as 'a flattering (*smisket* adj.) person'. The motivation pattern in these word sets thus represents a conflation of reletadness type (d) and (f) illustrated in (11) above. Identical or closely related motivation structures are found in 37 word sets. The meaning of the adjectives reflects very well the persistent character of a person having the property described by the masculine noun.

smisk-e, (v. 'flatter') ⟶ *smisk* (N 'flattery')
                               ⟶ *smisk* (M 'flatterer')
   ⟶ *smisk-et* (adj. 'flattering')
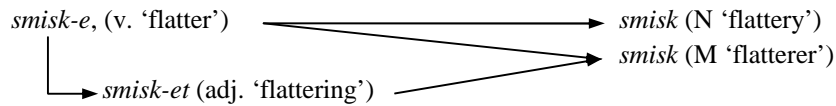
Figure 12. Motivation structure in affective nouns in NN

In fact, the degree of affectiveness in the meaning of animate nouns clearly distinguishes ON from NN. In Tables 13 and 14 all animate nouns included in gender patterns of ON and NN are grouped as to whether they have affective meaning or not. From the numbers in the tables we can infer that of all 125 animate nouns in ON gender patterns, only 16, i.e., 13%, can be characterized as affective. In the corresponding NN group, the number is

112 out of 170, which means 66%. Affectiveness is thus a salient property of these animate nouns in NN whereas they are by and large neutral in ON.

Table 13. Affective vs. neutral animate nouns in ON

affective	**F**	**female**	*fífla, hóra, horna, hrísa, stúfa*	#
	M	**male**	*fífli, hórr, skrapr, þrapr*	
		unspec.	*dári, dolgr, ginningr, mælingr, umrenningr, rekningr*	
	N	**male**	*fífl*	16
neutral	**F**	**female**	*arfa, asna, bræðrung, fóstra, fyla, gemla, granna, hapta, hertoga, íbúa, jafnaldra, jarla, kvíga, kæra, maka, mála, motra, nafna, næstabræðra, púsa, rúna, simul, systrung, unnasta, vina*	
		unspec.	*fluga, hirð*	
	M	**male**	*arfi, asni, bræðrungr, búi, fóstri, fylkir, geldingr, gildi, granni, griði, hangi, haptr, hertaki, hertogi, íbúi, jafnaldri, jarl, kappi, kvígr, kæri, landi, liði, maki, máli, nafni, næstabræðri, púsi, rúni, samlagi, simull, skeggi, spillingi, spjalli, stýrir, systrungr, sættir, taki, þulr, unnasti, valdi,*	
		unspec.	*arftaki, arfræningr, birtingr, boði, brennir, deilir, dœll, dragi, faxi, fellir, fœðir, franzeis, frauðr, freki, gemlir, gíslingr, hirðir, hjolpr, hnöggvingr, hyrningr, kaupi, krummi, kunningi, leiðsagi, líni, nautr, nistir, reimir, sali, skeytir, sóti, sviki, sviptir, þopti, vinnr, vitringr, ættleiðingr*	
	N	**unspec.**	*fyl, fylki, lið*	109

Table 14. Affective vs. neutral animate nouns in NN

affective	**F**	**female**	*bumse, busse, drunse, dulle, fjolle, flakse, flogse, furke, grebbe, hore, jåle, lubbe, lurve, rugge, rulte, sabbe, sjuske, skrulle, slabbe, slubbe, slumse, slurve, subbe, syte, tulle*	#
		unspec.	*sipe, sippe*	
	M	**male**	*bumse, busse, furk, grebb, jål/jåle, larv, lurv, pjusk, rult, sjusk, slark,*	
		unspec.	*ap, bleiking, bløyting, brask, byting, daff, drøl, fant, fark, fjask, fjasl, fjatl, fjoll, fjås, flås, fommel, framfusing, gams, gap, glafs, glis, gofs, graps, grin, græl, jask, krasl, kryp, kvim, leiing, lubb, pirk, purl, pusling, rafs, rolp, rugg, sabb, sjask, skark, skeiving, skrangel, skrull, slabb, slafs, slarv, slask, slubb, slums, slurv, smisk, smyg, stygging, subb, tok, trask, tukl, tulling, tusl, tutl, uviting, vabb, vas, vasl, veiking, vim, vingel, vringel*	
	N	**unspec.**	*fjoll, kryp, rangel*	112
neutral	**F**	**female**	*bjørne, borke, fostre, gifte, hoppe, katte, kokke, novise, reve, sugge, tuppe, tusse, ulve, vett*	
		unspec.	*lange, nuve, spette*	
	M	**male**	*festing, fostre, novise*	
		unspec.	*bjørn, døl, framfare, frisking, jamning, katt, kjenning, kokk, landing, like, luring, lysing, løysing, namne, nuve, politi, rev, riking, sugg, syning, træl, tuft, tuss, ulv, utsending, ætting, økumen*	
	N	**unspec.**	*føde, gifte, adelskap, formannskap, legde, mannskap, politi, presidentskap, riddarskap, vette, økumene*	58

If we stay within concrete concepts, there are two more semantic properties of gender patterns that lend themselves to further analysis.

3.2.2. Instrumental meaning and constituency

In 19 ON gender patterns, F is the only inanimate concrete noun. In this group, there is a clear tendency for F to have instrumental meaning. In nine cases where F can be said to be motivated by a verb, its meaning could be paraphrased as 'a thing to VERB with'. Thus, a *blaka* (F 'fan') is 'a thing to wave (*blaka* v.) with', a *skella* (F 'rattle') is 'a thing to rattle (*skella* v.) with', a *þerra* (F 'wipe') is 'a thing to wipe up (*þerra*, v) things with', etc. This tendency is still alive in NN. Here, the group of gender patterns with F as the only inanimate concrete, counts 39 word sets. In 18 of them F has instrumental meaning. A *disse* (F 'swing') is 'a thing to swing (*disse* v.) in', a *krafse* (F 'scratch) is 'a thing to scratch (*krafse* v.) with', etc. In some of theses cases, the word-formation process that resulted in the gender pattern went actually the other way round. According to NOB, the verb *sveive* ('crank'), for example, is a conversion from the noun *sveiv* (F 'crank'). Nonetheless, from a synchronic point of view, the motivation can be said to be at least as strong in the other direction since the action denoted by the verb is not limited to the use of a crank.

In ON gender patterns including at least two inanimate concretes, there is a somewhat weaker cluster of pairs of nouns being related to each other in the way that the thing or mass denoted by the one noun is a constituent of the thing or mass denoted by the other noun. Thus, a *hasla* (F 'hazel rod') is 'a thing made of (a part of) a hazel (*hasl* M)', a *teina* (F 'fishpot') is 'a thing made of twigs (*teinn* M). However, it is not quite clear how the combination of genders is used in all of these examples. In NN, a handful of similar cases still exist, e.g., *ragge* (M 'sock made of shag'), which forms a gender pattern with *ragg* (N 'shag').

In both semantic clusters discussed above the motivation between the two nouns in the gender patterns originates from metonymy. According to Blank (1999: 184) "[m]etonymy as a linguistic device is the transfer of a word to another concept on the basis of conceptual contiguity between a donator and a target concept". Moreover, he adds that "[a]ny spontaneous metonymy can be adopted by the speech community and thus become lexicalized" (Blank 1999: 184). Conceptual contiguity between concepts means that they either are "spatially and/or temporally 'co-present'" or stand in a "causual, instrumental, final or concecutive relation" (Blank

1999: 178–179). Contiguous relations of these kinds are found in both static frames as well as dynamic scenarios. In Norwegian gender patterns, we are thus confronted with lexicalized metonymic relations of both two main types. The activity denoted by the verb in the first cluster above is conceptually contiguous to the instrument used to carry out the action. By metonymy the verb is transferred to a noun and thereby the focus is moved from the activity onto the instrumental role in the action frame (cf. Dirven 1999: 280–282). The conceptual transfer goes thus from ACTIVITY to IN-STRUMENT, exemplified by e.g., ON *blaka* (v.) à *blaka* (F). Similarly, conceptual contiguity holds between MATERIAL and PRODUCT in the second cluster outlined above, e.g., in the ON noun pair *teinn* (M) − *teina* (F) (cf. Blank 1999: 181–182). In addition to these dynamic frames we already saw metonymy at work in a static frame in our discussion of animate nouns in gender patterns in 3.2.1. above. The contiguous relation between the concepts in these patterns are best described as PART−WHOLE metonymy, as in BEARD−MAN in the ON pair *skegg* (N) – *skeggi* (M). Rounding up this section, we can summarize the metonymic relations found in Norwegian gender patterns in Figure 13.

Animate:	PART−WHOLE		
	MANE−HORSE	ON	*fax* (N) − *faxi* (M)
	BEARD−MAN		*skegg* (N) − *skeggi* (M)
	FOAM−FROG		*frauð* (N) − *frauðr* (M)
Inanimate:	MATERIAL−PRODUCT		
	HAZEL−HAZEL ROD	ON	*hasl* (M) − *hasla* (F)
	TWIG−FISHPOT		*teinn* (M) − *teina* (F)
	SHAG−SOCK	NN	*ragg* (N) − *ragge* (M)
	ACTIVITY−INSTRUMENT		
	WAVE−FAN	ON	*blaka* (v.) − *blaka* (F)
	RATTLE−RATTLE		*skella* (v.) − *skella* (F)
	WIPE (UP) −WIPE		*þerra* (v.) − *þerra* (F)
	SWING−SWING	NN	*disse* (v.) − *disse* (F)
	SCRATCH−SCRATCH		*krafse* (v.) − *krafse* (F)
	CRANK−CRANK		*sveive* (v.) − *sveiv* (F)

Figure 13. Metonymic relations in gender patterns

3.2.3. Concrete vs. abstract

The last semantic property to be discussed here is the distinction between concrete and abstract. Abstract concepts, especially nouns denoting actions

and states of affairs, have been analysed as to temporal boundedness and distribution (cf. Frawley 1992: 81–88, Talmy 2000: 63–64). Since the data for the present study is based on dictionaries only, and no primary investigation into the source manuscripts has been carried out, it often turned out to be impossible to code abstract nouns according to the theoretical concepts found in the literature. Neither boundedness nor temporal distribution seems to be able to explain the gender distribution found in abstract gender patterns. In ON gender patterns containing only one abstract noun, the quantitative distribution between the genders is 19 F, 12 M, and 27N. In NN, the figures are 13 F, 19 M, and 103 N. From this we can conclude that, at least by type-frequency, N has come to be by far most typically associated with abstract concepts in gender patterns. This tendency is corroborated by the fact that in NN many abstract M, and in particular, F are to a great extent lexicalized, whereas abstract N nouns in most cases transparently reflect the basic meaning of the motivating verb in the word set. Abstract N nouns most often code the action or state expressed in the verb either as a bounded concept, e.g., *bite* (v. 'bite') à *bit* (N 'biting [one single time]') or as an unbounded concept, e.g., *glafse* (v. 'crave') à *glafs* (N 'craving'). In gender patterns with only one abstract noun, the combination of concrete and abstract is most typically correlated with the combination of M/N, with M most typically being an animate noun, e.g., *fomle* (v. 'fumble') – *fommel* (M 'clumsy person') – N ('fumbling'). In Table 15, I have summarized the quantitative distribution between the semantic pattern concrete vs. abstract on the one hand, and the combination of genders on the other.

Table 15. Gender combinations of concrete vs. abstract

concrete	abstract	ON #	NN #
F	M	9	12
F	N	9	33
M	F	14	9
M	N	22	70
N	F	6	5
N	M	4	7

The figures in the table leave no doubt about N being the most preferred gender to encode abstract concepts in gender patterns of modern Norwe-

gian. A more thorough, corpus-based investigation of these abstract nouns is left to future research.

3.3. Diachronic development of gender patterns in Norwegian

From the parallel discussion of gender pattern in ON and NN, it should have become apparent that the phenomenon has not been changed much in principle between the two stages of the language. The 637 nouns involved in gender patterns in NN represent a slightly smaller share of the entire system of non-compound nouns than the 394 nouns compared to the ON system. Still, the phenomenon of gender pattern in NN is twice as type-frequent as the second most common derivational suffix *-skap*. We also saw that the gender patterns in this modern stage are not just lexicalized items that to some extent are preserved from an earlier stage. Most of the gender patterns in NN are actually not attested at the ON stage.

The formal and semantic properties of gender patterns have changed in some ways. The perhaps most striking change is the phonological reduction and loss of declensional endings. As described in section 3.1.1., the combination of declensional endings in gender patterns reinforces the very same patterns by marking the nouns with gender typical endings. Due to the phonological changes in Middle Norwegian, the basic form endings in NN have to a large extent become homonymous and thus less suited to mark gender. There are, however, differences in the preference of certain endings.

The morphological structure of the noun stem in gender patterns has not changed noticeably. The same can be said about the manner in which the nouns in gender patterns are related to each other. The most significant changes occurred in the semantic properties of gender patterns. In ON the semantic way in which animate nouns are sex-differentiated with the help of gender patterning does not seem to vary from other, e.g., segmental, means of word-formation. In NN, on the other hand, the process of sex-differentiation by gender patterning is clearly more tied to affectively loaded designations for animates. It seems that the formation of female counterparts of concepts without affective value is, to the extent it is needed, done by segmental derivation. The strategy to use common forms for both males and females, so-called epicenes, is anyway more common today. The creation of affective animate nouns appears thus to have become a niche for gender patterning. The other change noticed is that N has

strengthened its position as the most typical gender assigned to abstract nouns in gender patterns.

Apart from the more recent development of gender patterning sketched above, I would finally like to widen the temporal scope of diachronic comparison in order to obtain a more evolutionary understanding of word-formation. Figure 14 illustrates the diachronic development of the gender pattern based on the root *hor-* ('whore'). In addition to ON and NN two more language stages are included: Proto-Germanic (PGmc), and Ancient Nordic (AN).

	('adultery')	('whore')	('whore')	('adulterer')
PGmc	**hōr~a* (N) ⟶	**hōr~ō-n* (v.)	**hōr~ō-n* (F)	**hōr~a-R* (M)
AN	**hōr~a* (N)	**hōr~a-n* (v.)	**hōr~ō* (F)	**hōr~a-R* (M)
ON	*hór* (N)	*hór-a* (v.)	*hór-a* (F)	*hór-r* (M)
NN	*hor* (N)	*hor-e* (v.)	*hor-e* (F)	(*hor+kar* (M))[18]

Figure 14. Origin and development of gender patterns

There is one principle difference in word structure that distinguishes these two earlier stages from both ON and NN. In PGmc the stem of most lexemes is marked by a so-called stem formative.[19] By ON times these segments are either lost, as in *hór* (N) and *hórr* (M), or they have been "transformed" into inflectional endings, as in *hóra* (v., F). Gender patterns as defined in (4) arise thus only after these changes. Before that stage the nouns in such word sets were not only distinguished by gender but also by a stem formative. The status of these formatives (in Germanic) is debated. According to Kastovsky (1985: 246) they "probably had some derivative-semantic function just like the consonantal suffixes, but primarily they determined the inflectional class of the lexical item in question". Pimenova (2004: 252) explicitly affirms the derivational function of these stem formatives, which according to her carry the word-formational meaning ("Wortbildungsbedeutung") in the lexical relations discussed here.

The role of gender in these word-formation patterns is thus best seen as a complementary feature that is exploited in tandem with segmental elements. In the course of phonological erosion leading to the ON system, more derivational content is loaded onto gender, frequently inforced by inflectional endings as described in 3.1.1. In Figure 15 this change in word-formation is illustrated in (b) and (c).

(a)	(b)	(c)
[root1]+**[root2]**(-[infl.]) à	[root]~**[stem formativ]**(-[infl.]) à	[root](-[infl.])
(+gender)	**+gender**	**+gender**

Figure 15. Origin and development of gender patterns

As Brugmann (1904: 312–315) points out, the origin of stem formatives in Indo-European is unclear. Some of them, he assumes, may have evolved from second elements in compounds (Brugmann 1904: 312). Brugman's assumption is in line with modern grammaticalization theory, which holds that affixes typically derive historically from independent words (Hopper and Traugott 2003: 6–7). For our discussion, this means that the word-formation pattern in (b) has its origin in the compounding type in (a), where the primary word-formation load obviously lies on root2. The evolution of gender patterning in Norwegian can thus be summarized as a gradual cline in the importance of gender as a word-formation device.

4. Concluding remarks

The phenomenon of gender patterning as described in this study, I argue, represents another reason for why gender is not to be regarded as a superfluous relict in some languages. The way in which new nouns are created through both direct and indirect gender patterning is in many respects more economic and convenient than, e.g., segmental derivation. Admittedly, gender patterns that do not involve sex-differentiation are similar to, e.g., English "normal" conversions of the action vs. person type: *fool – fool*. Some of the semantic structures found in gender patterns can thus be realized without involving gender (i.e., in gender-less languages). But, as it seems, if a language has gender and uses the process of conversion, it also uses gender to formally reinforce the semantic patterns created between the participants or rather the results of the word-formation process. Diachronically, gender patterning is therefore just another example of (re)using existing linguistic structures efficiently.

Appendix 1: Translation of ON examples

aldr (M 'age'), *arfa* (F 'inheritress'), *arfi* (M 'inheritor'), *arfr* (M 'inheritance'), *arfræningr* (M 'robber of someone's inheritance'), *arftaki* (M 'inheritor'), *asna* (F 'female donkey'), *asni* (M 'donkey'), *birtingr* (M 'bright trout'), *blak* (N 'wave'), *blaka* (F 'fan'), *boði* (M 'ruler'), *brennir* (M 'burner'), *bróðir* (M 'brother'), *broeðrung* (F 'female cousin/daughter of paternal uncle'), *búa* (v. 'live, reside'), *búi* (M 'farmer'), *dári* (M 'fool'), *deila* (F 'dispute'), *deili* (N 'dividing mark'), *deilir* (M 'distributor'), *dæll* (M 'dalesman, -woman'), *dolgr* (M 'enemy'), *dragi* (M 'row of pack horses'), *elptr* (F 'swan'), *faxi* (M 'horse'), *fella* (F 'trap'), *fellir* (M 'trapper; destroyer'), *fífl* (N 'fool'), *fífla* (F 'female fool'), *fífli* (M 'fool'), *fluga* (F 'fly'), *fæðir* (M 'feeder'), *fóstra* (v. 'bring up'), *fóstra* (F 'foster-mother'), *fóstri* (M 'foster-father'), *franzeis* (M 'Frenchman'), *frauðr* (M 'frog'), *freki* (M '«the greedy», i.e., wolf'), *fyl* (N 'foal'), *fylki* (N 'phalanx; county'), *fylkir* (M 'chief'), *geldingr* (M 'gelded animal'), *gemla* (F 'one year old ewe'), *gemlir* (M '«the (one) year old», i.e., eagle'), *gildi* (M 'guild brother'), *gildi* (N 'guild'), *ginningr* (M 'fool'), *gíslingr* (M 'hostage'), *granna* (F 'female neighbour'), *granni* (M 'neighbour'), *griði* (M '(free) servant'), *hangi* (M 'hanged man'), *hapt* (N 'hindrance; chain'), *hapta* (F 'female captive'), *haptr* (M 'captive'), *hepta* (v. 'hinder; capture'), *herra* (M 'lord, master'), *hertaki* (M 'conquered man'), *hertoga* (F 'duchess'), *hertogi* (M 'duke'), *hirð* (F 'king's bodyguard'), *hirðir* (M 'shepherd'), *hjolpr* (M 'helper, midwife'), *hnöggvingr* (M 'skinflint'), *hóra* (F 'whore'), *hóra* (v. 'whore'), *horna* (F 'mistress' daughter'), *hórr* (M 'adulterer'), *hrísa* (F 'mistress' daughter'), *hyrningr* (M 'creature with horn(s)'), *íbúa* (F 'female dweller'), *íbúi* (M 'dweller'), *jafnaldra* (F 'female peer'), *jafnaldri* (M 'peer'), *jarl* (M 'earl'), *jarla* (F 'earl's wife'), *kappi* (M 'giant'), *kaup* (N 'buying, purchase'), *kaupi* (M 'buyer'), *kippi* (N 'bunch, bundle'), *kippr* (M 'tug'), *krummi* (M 'raven'), *kunningi* (M 'acquaintance'), *kvíga* (F 'heifer'), *kvígr* (M 'young bull'), *kæra* (F 'female friend'), *kæri* (M 'friend'), *kærr* (adj. 'dear'), *landi* (M 'countryman'), *leiðsagi* (M 'guide'), *leika* (N 'toy'), *leika* (F 'toy'), *leikr* (M 'game, play'), *lið* (N 'group; herd'), *liði* (M 'companion'), *lim* (F 'twig'), *lim* (N 'twigs'), *limr* (M 'twig'), *líni* (M 'person working with flax/linen'), *ljá* (F 'newly mown grass'), *ljár* (M 'scythe'), *maka* (F 'wife; female equal'), *maki* (M 'husband; equal'), *makr* (adj. 'appropriate'), *mál* (N 'speaking, speech; conversation'), *mála* (F 'female conversation partner, friend'), *máli* (M 'conversation partner, friend'), *motra* (F 'woman wearing a kerchief'), *mælingr* (M 'skinflint'), *nafn* (N 'name'), *nafna* (F 'female namesake'), *nafni* (M 'male namesake'), *nautr* (M '(co-)owner'), *nistir* (M 'feeder'), *næstabræðra* (F 'female second cousin'), *næstabræðri* (M 'second cousin'), *púsa* (v. 'marry'), *púsa* (F 'wife'), *púsi* (M 'husband'), *reim* (F 'strap'), *reimir* (M 'snake; worm'), *rekningr* (M 'outcast'), *rún* (F 'intimate conversation'), *rúna* (F 'intimate female friend'), *rúni* (M 'intimate friend'), *sali* (M 'salesperson'), *samlagi* (M 'fellow'), *simul* (F 'female reindeer'), *simull* (M 'male reindeer'), *sin* (N 'sinews'), *sin* (F 'sinew'), *skeggi* (M 'bearded man'), *skeytir* (M 'shooter'), *skrap* (N 'chattering'), *skrapr* (M

'chatterbox'), *slóð* (F 'drag trail'), *slóði* (M 'tow'), *smíð* (F 'work'), *smíði* (N 'creation, product, make'), *sóti* (M 'carbon black horse'), *spillingi* (M 'leprous man'), *spjalli* (M 'friend to talk with'), *stúfa* (F 'female thief'), *stýrir* (M 'mate; chairman'), *sviki* (M 'betrayer'), *sviptir* (M 'puller, thrower'), *systrung* (F 'female cousin/doughter of maternal aunt'), *systrungr* (M 'cousin'), *sætt* (F 'settlement, (re)conciliation'), *sætti* (N 'settlement, (re)conciliation'), *sættir* (M 'conciliator'), *taki* (M 'surety'), *teina* (F 'fishpot'), *teinn* (M 'twig; sapling'), *þopti* (M 'rowing mate'), *þrapr* (M 'chatterbox'), *þulr* (M 'speaker; wise man'), *umrenningr* (M 'vagabond'), *unna* (v. 'love'), *unnasta* (M 'mistress'), *unnasti* (F 'lover'), *valdi* (M 'chief; chairman'), *vámr* (M 'disgusting guy'), *vina* (F 'female friend'), *vinnr* (M 'worker, accomplisher'), *vinr* (M 'friend'), *vitringr* (M 'wise person'), *ættleiðingr* (M 'adopted person')

Appendix 2: Translation of NN examples

adelskap (N 'nobility'), *ap* (M 'teaser'), *bjørn* (M 'bear'), *bjørne* (F 'female bear'), *bleiking* (M 'pale person'), *bløyting* (M 'coward'), *borke* (F 'white-yellow mare'), *brask* (M 'show-off'), *brot* (N 'break, breaking'), *brote* (M 'heap of fallen trees or other organic matter'), *brote* (F 'place where a fence has been broken down'), *bumse* (F 'big and heavy female creature'), *bumse* (M 'big and heavy guy'), *bumse* (v. 'shamble'), *busse* (M 'big, able guy; mate'), *busse* (F 'big, able woman'), *byting* (M 'coward'), *daff* (M 'lazy person'), *drunse* (F 'big and heavy woman'), *drøl* (M 'dawdler'), *drøl* (N 'dawdling'), *dulle* (F 'small and chubby girl or woman'), *døl* (M 'dalesman, -woman'), *fant* (M 'tramp'), *fark* (M 'tramp'), *festing* (M 'fiancé'), *fjask* (M 'slouch'), *fjasl* (M 'wimp'), *fjatl* (M 'wimp'), *fjoll* (N 'idiot'), *fjoll* (M 'idiot'), *fjolle* (F '(female) idiot'), *fjås* (M 'fool'), *flakse* (F 'female fool'), *flogse* (F 'female fool'), *flås* (M 'flippant person'), *fommel* (M 'clumsy person'), *formannskap* (N 'executive committee'), *fostre* (F 'foster-mother'), *fostre* (M 'foster-father'), *fostre* (v. 'bring up'), *framfare* (M 'guardian spirit'), *framfusing* (M 'bold, foolhardy person'), *frisking* (M 'daring and fearless person'), *furk* (M 'big and strong guy'), *furke* (F 'big and strong woman'), *føde* (N 'brood'), *gams* (M 'fool'), *gap* (M 'fool'), *geip* (M 'flippant'), *geipe* (v. 'pout'), *geipe* (F 'flippant'), *gifte* (F '(female) match, spouse'), *gifte* (N 'match, spouse'), *glafs* (M 'persistent person'), *glis* (M 'grinner'), *gode* (N 'good, benefit'), *gode* (M 'good, use'), *gofs* (M 'bold, foolhardy person'), *graps* (M 'yob'), *grebb* (M 'stocky man'), *grebbe* (F 'stocky woman'), *grebben* (adj. 'stocky'), *grin* (M 'crabby person'), *græl* (M 'overwhelming, hard-working person'), *hoppe* (F 'mare'), *hore* (F 'whore'), *host* (N '(single) cough'), *hoste* (M 'cough, coughing'), *jamning* (M 'equal, peer'), *jask* (M 'fool'), *jål/jåle* (M '(male) show-off'), *jåle* (F 'female show-off'), *jålet* (adj. 'vain, conceited'), *katt* (M 'cat'), *katte* (F 'female cat'), *kipp* (M 'pulling, flipping'), *kippe* (N 'bunch'), *kjenning* (M 'acquaintance'), *kokk* (M 'cook'), *kokke* (F 'female cook'),

krafs (N 'scrape'), *krafse* (F 'scrape'), *krasl* (M 'smudging person'), *kryp* (M 'poor creep'), *kryp* (N 'crawling insect, creepy-crawly'), *kverv* (M 'arch'), *kverve* (F 'withe ring'), *kverve* (N 'arch'), *kvim* (M 'scatterbrain'), *landing* (M 'person from Land'), *lange* (F 'ling'), *larv* (M 'miserable wretch'), *legde* (N 'brood'), *leiing* (M 'disgusting person'), *like* (M 'equal, peer'), *lubb* (M 'chubby creature'), *lubbe* (F 'chubby girl or woman'), *lubben* (adj. 'chubby'), *luring* (M 'sneaky person'), *lurv* (M 'tramp'), *lurve* (F 'shabby woman'), *lurvet* (adj. 'shabby, sloppy'), *lysing* (M 'hake'), *løysing* (M 'liberated bondservant'), *mannskap* (N 'crew'), *mjølk* (F 'milk'), *mjølke* (M 'milt'), *namne* (M 'namesake'), *novise* (M 'male novice'), *novise* (F 'novice'), *nuve* (M 'lobster without claws'), *nuve* (F 'sheep with short ears'), *pirk* (M 'niggling, finicky person'), *pjusk* (M 'miserable wretch'), *politi* (M 'police officer'), *politi* (N 'police'), *presidentskap* (N 'presidential cabinet'), *purl* (M 'gabbling person'), *pusling* (M 'weakling'), *rafs* (M 'slouch'), *rangel* (N 'lanky person'), *rasp* (F 'rasp'), *rasp* (N 'rasp'), *rev* (M 'fox'), *reve* (F 'female fox'), *riddarskap* (N 'knighthood'), *riking* (M 'well-heeled person'), *rolp* (M 'lumpy creature'), *rugg* (M 'giant; whopper'), *rugge* (F 'big woman'), *rugge* (v. 'lumber, stagger'), *rult* (M 'fat boy or man'), *rulte* (F 'fat girl or woman'), *rulte* (v. 'lumber, stagger'), *sabb* (M 'slovenly, untidy person'), *sabbe* (F 'slovenly, untidy woman'), *sabbe* (v. 'lumber, stagger; slop'), *saks* (N 'big knife'), *saks* (M 'crossed skis'), *saks* (F 'scissors'), *sete* (M 'backside'), *sete* (N 'seat'), *sete* (F 'sitting'), *sipe* (F 'whiner'), *sippe* (F 'whiner'), *sjask* (M 'careless person'), *sjusk* (M 'shabby, slovenly man'), *sjuske* (F 'shabby, slovenly woman'), *sjusket* (adj. 'slovenly, careless'), *skark* (M 'meagre and exhausted creature'), *skeiving* (M 'person with uneven, slanting gait'), *skrangel* (M 'person with unsteady, slanting gait'), *skrull* (M 'crackpot'), *skrulle* (F 'weird woman'), *skrullet* (adj. 'crazy'), *slabb* (M 'sloppy person'), *slabbe* (v. 'work sloppily'), *slabbe* (F 'sloppy woman'), *slafs* (M 'sloppy person'), *slark* (M 'lazy guy'), *slarv* (M 'slouch'), *slask* (M 'slob'), *slubb* (M 'careless, sloppy person'), *slubbe* (v. 'work sloppily'), *slubbe* (F 'sloppy woman'), *slums* (M 'careless person'), *slumse* (F 'careless woman'), *slumset* (adj. 'careless; sloppy'), *slurv* (M 'careless, slovenly person'), *slurve* (F 'careless woman'), *slurven* (adj. 'careless, slovenly'), *smisk* (M 'flatterer'), *smyg* (M 'sneaker'), *spette* (F 'plaice'), *spjett* (M 'small and thin guy'), *spjåk* (M 'tastelessly dolled up man'), *stygging* (M 'ugly person'), *subb* (M 'shabby person'), *subbe* (F 'frump'), *subbet* (adj. 'shabby'), *sugg* (M 'beast'), *sugge* (F 'sow'), *sveiv* (M 'crank, swing'), *sveiv* (F 'crank'), *syning* (M 'supervisor'), *syte* (F 'whiner'), *søkk* (M 'sink'), *søkke* (N 'weight'), *tok* (M 'fool'), *trask* (M 'small, weak and cowardly person'), *træl* (M 'bondservant'), *tuft* (M 'gnome'), *tukl* (M 'tampering person'), *tulle* (F 'silly woman'), *tulling* (M 'silly person'), *tuppe* (F 'hen'), *tusl* (M 'wimp'), *tuss* (M 'gnome'), *tusse* (F 'female gnome'), *tutl* (M 'wimp'), *ulv* (M 'wolf'), *ulve* (F 'female wolf'), *utsending* (M 'emissary'), *uviting* (M 'fool'), *vabb* (M 'person with unsteady, slanting gait'), *vas* (M 'messy person'), *vasl* (M 'poking person'), *veiking* (M 'weakling'), *vett* (F 'wicked nymph'), *vett* (N 'sense'), *vette* (N 'spirit'), *vim* (M 'wobbly person'), *vim* (N 'fancy idea'), *vime* (F 'confusion, daze'), *vingel* (M

'clumsy, confused person'), *vringel* (M 'quarrelsome person'), *ætting* (M 'kinsman'), *økumen* (M 'ecumenist')

Notes

1. Inflectional endings are separated by a hyphen. The examples are i.a. cited in the following literature: Rubenbauer and Hofmann (1975: 24) for Latin (LAT); Bergenholtz and Mugdan (2000: 444), Marcantonio and Pretto (1991: 317–322) for Italian (ITA); Ralli (2002: 530) for Greek (GRE); Mathiassen (1996: 37), Senn (1966: 101) for Lithuanian (LIT); Doleschal (1992: 20), and Pimenova (2004: 252) for Old High German (OHG).
2. The term motion/"Movierung" only seems to cover the semantic aspect of the word-formation process at stake. Formally, motion can also be realized by suffixation, e.g., German *Lehrer* ('teacher') à *Lehrerin* ('female teacher') (Doleschal 1992: 27).
3. Connections exist of course also between the instances of the modifiers, e.g., between *sá* and *sá*, *sú* and *sú*, etc., as well as between declensional endings. These lines are not drawn in the figure since this would make the illustration difficult to interpret. For the same reasons no semantic representation is included.
4. For the sake of simplicity, I have chosen a relatively simple instance of gender pattern. As we shall see in section 3.2.1., the semantic type represented in the gender pattern *kokk* (M) *kokke* (F) is actually less prevalent in modern Norwegian than in ON. However, the main point was to illustrate in principle how gender patterning can be modelled in a network model.
5. The role of the declensional endings, in this case -Ø and -*e*, is discussed in section 3.1.1.
6. Doleschal (2000) and Nesset (2006) give a more detailed account of gender assignment within a cognitive framework, and they also explore some of the technicalities of the models. Those aspects are of minor relevance for the present study.
7. The data used in this work is part of a large-scale database containing all nouns from Fritzner (1973) and NOB and which is used in a research project on the development of the gender assignment system of Norwegian. The database is described in more detail in Conzett (2007). I would like to thank Ruth V. Fjeld at the Department of Linguistics and Scandinavian Studies at the University of Oslo for giving me access to the electronic versions of these dictionaries. Furthermore, I am grateful to Christian Emil Ore at the Unit for Digital Documentation for initial adjusting of the electronic lists to fit my research purposes.

8. Some of these nouns might actually turn out to differ in meaning if analyzed more thoroughly. Also, the attested indifference in meaning of some nouns may in fact be due to incomplete recording in the dictionary. This may especially be the case for ON where the data sources are much sparser. I leave these cases to future research.

9. Confer, e.g., *puste* (v. 'breath') – *pust* (M 'breath') – *pust* (M/N 'breath, puff')

10. Translations of all Norwegian examples used in tables are given in Appendix 1 (Old Norse), and Appendix 2 (Nynorsk).

11. The numbers are from Conzett (2007).

12. The following discussion is inspired by Harris (1991).

13. The nouns containing the stem *leiðsag-* can be said to be motivated by a verb phrase like *segja (einhverjum) leið* ('to tell (someone) which/the direction'). The second element in these nouns is identical with the preterite root *sag-* of the verb s*egja* ('say, tell'), and it is neither a suffix in ON nor attested as an independent noun. The word-formation process resulting in such nouns is much debated (cf., e.g., Beard 2001: 53–54).

14. The element *-ræning-* can be clearly divided in *ræn-*, which is identical with the root in the verb *ræna* ('rob') and the suffix *-ing*. However, there are no attested independent nouns **ræning(r)*; thus, the noun *arfræning* and *arfræningr* are not classified as compounds. In the literature, cases like these are sometimes (somewhat confusingly) called *synthetic compounds* (cf. Beard 2001: 53–54).

15. Gender conversion is a subtype of rectional conversion (Mel'čuk 1997: 315, 2006: 305).

16. Cf. the postulate for bidirectionality in conversion by Umbreit, this volume.

17. Some of the noun sets actually consist of one more noun which, for the sake of simplicity, is not included in this and the following tables.

18. In NN the concept of ADULTERER is denoted by the compound *hor+kar*, literally 'whore guy'.

19. In the figure these elements are separated from the root by a tilde. The stem formatives in AN are somewhat more opaque as in some cases they have been blurred with inflectional endings. This is not apparent from the figure since only citation forms are shown.

Acknowledgements

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