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# The continuing challenge of the German gender system

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## 1 Introduction

We have come a long way since Mark Twain (1880) suggested that German gender had ‘no sense or system’, a sentiment echoed in Bloomfield (1933: 280). Researchers such as Klaus-Michael Köpcke and David Zubin have demonstrated clear regularities in the assignment of gender to German nouns. However, the German gender system has not yielded all of its secrets; we know many of the parts but the whole still eludes us. It deserves continuing research, as one of the most complex systems, with interacting semantic, morphological and phonological assignment principles. The challenge can be stated simply: given contexts like those in (1a) - (1c), how do speakers of German consistently assign a gender value (masculine, feminine, or neuter) to nouns, and hence produce the agreements?

- (1) a. ein                    neu-er                    Film  
      a[NOM.M/N.SG]        new-NOM.M.SG        film(M)[NOM.SG]  
      ‘a new film’
- b. ein-e                neu-e                    Symphonie  
      a-NOM.F.SG        new-NOM.F.SG        symphony(F)[NOM.SG]  
      ‘a new symphony’
- c. ein                    neu-es                    Buch  
      a[NOM.N/N.SG]        new-NOM.N.SG        book(N)[NOM.SG]  
      ‘a new book’

The basic semantic assignment rules are straightforward. Sex-differentiable nouns, i.e. nouns which refer to male or female humans or male or female (higher) animals, e.g. *der Mann* ‘man’, *die Frau* ‘woman’, *der Bulle* ‘bull’, *die Kuh* ‘cow’, are assigned gender on the basis of biological sex. (We adopt the convention of giving nouns with the appropriate definite article (nominative singular) to indicate gender, namely *der* (masculine), *die* (feminine), and *das* (neuter), e.g. *das Buch* [the.N bed(N)] ‘the book’.) For most German nouns, however, including the inanimates in (1), gender assignment is formal, that is, it follows their morphology or their phonology. Phonological assignment rules have been investigated in detail (Köpcke 1982; Köpcke & Zubin 1983), and there are studies of the relation between gender and inflection class (Augst 1975; Bittner 1999; Kürschner & Nübling 2011). Yet despite the typological interest of the German system, and the analytical progress on parts of the system, there is no comprehensive analysis of the whole system, as has been done for other languages which rely on a combination of semantic and formal assignment rules, such as Russian (Corbett 1991; Corbett & Fraser 2000).

We will discuss morphological (§3) and phonological (§4) assignment of German nouns. We will pay particular attention to an interesting suggestion, been widely discussed, namely that German has semantic clusters which are associated with a certain gender (§5). These clusters involve smaller numbers of nouns than the semantic assignment rules; for example, most alcoholic drinks are masculine.

## 2 The overall numbers

Given the complexity of the system, an important step is to put numbers to predictions. Thus when evaluating a suggested morphological or phonological assignment rule, we compare this rule to the overall distribution of nouns over the gender values. This allows us to ascertain whether prediction by the rule is better than chance. Table 1 gives percentages according to noun frequency, based on the CELEX database (Baayen et al. 1995).

Table 1. Overall gender distribution in German (rounded to full percentages)

Most frequent ...	MASCULINE	FEMININE	NEUTER
... 100 nouns	34%	35%	31%
... 1,000 nouns	37%	41%	22%
... 10,000 nouns	36%	45%	19%

The difference in proportions depending on frequency-based sample size is revealing. A key factor is that a larger sample contains more derived nouns, and derivation favours the feminine in German. The distribution raises intriguing questions for acquisition, which starts with the least regular part of the lexicon for gender assignment.

### 3 Morphological assignment

There are two sides to morphological assignment, word formation and inflection. We start with word formation, where overall we find better prediction rates than in inflection.

#### 3.1 Word formation

Morphologically complex German words are governed by the Last Member Principle (*Letzt-Glied-Prinzip*, see Köpcke & Zubin 1984: 28-29, and references there): the gender of the whole word is determined by the gender of the last element. In compounds the last element is a word with its own gender value. For example *der Mutterschutz* ‘maternity’ consists of the feminine first member *die Mutter* ‘mother’ and the masculine last member *der Schutz* ‘protection’; by the Last Member Principle it is masculine. Derivational affixes are similarly associated with a gender value, which is assigned to the derived word irrespective of the gender of the base (if this is a noun). For example, the suffix *-schaft* derives feminine nouns, e.g. *die Freundschaft* ‘friendship’ from the masculine noun *Freund* ‘friend’, or *die Landschaft* ‘landscape’ from the neuter noun *Land* ‘land’.

While assignment for nouns derived with productive suffixes is virtually without exception, e.g. all nouns derived with *-heit* and *-keit* are feminine, less productive derivational affixes are often not as good a predictor. The majority of nouns derived with *-el* are masculine, but we find more of a spread of genders, e.g. in *der Würfel* ‘cube, die’, *die Klingel* ‘bell’, *das Kürzel* ‘abbreviation, code’. For these nouns derived with *-el*, of 602 nouns, 59% are masculine, 25% are feminine, and 16% are neuter (Augst 1975: 30-32). This is presumably because a decrease in productivity of an affix makes it harder for speakers to associate a single gender value with it. Nevertheless, compared with the figures in Table 1, this generalization has some effect.

#### 3.2 Inflection

Three example paradigms are given in (2). Together they provide evidence for four cases, which are distinguished only poorly in individual inflection classes (ICs). ICs are identified by their principal parts (i.e. genitive singular/nominative plural).

(2) Forms for *Biene* ‘bee’ (IC  $-/(e)n$ ), *Tag* ‘day’ (IC  $-(e)s/-e$ ), *Zeuge* ‘witness’ (IC  $-(e)n/-(e)n$ )

	SINGULAR	PLURAL	SINGULAR	PLURAL	SINGULAR	PLURAL
NOMINATIVE	Biene	Bienen	Tag	Tage	Zeuge	Zeugen
ACCUSATIVE	Biene	Bienen	Tag	Tage	Zeugen	Zeugen
GENITIVE	Biene	Bienen	Tag(e)s	Tage	Zeugen	Zeugen
DATIVE	Biene	Bienen	Tag	Tagen	Zeugen	Zeugen

The perspective on German gender and IC used to be one-directional: typically the method was to start from gender to predict IC (see, for example, Augst 1975: 24-36; Bittner 1999). More recently, one also finds approaches where both gender and IC have predictive value (Kürschner & Nübling 2011). Given that there are more than a dozen ICs, though not of equal size (Pavlov 1995: 44), and just three genders, the logic suggests that we are likely to find prediction of gender from IC. We investigate both directions.

Given the gender of a noun what can we say about its inflection? The default IC for feminine nouns is  $-/(e)n$ , cf. the paradigm of *die Biene* ‘bee’ in (2) above. Prediction of IC from gender is not fully reliable, since there are at least four other ICs which contain feminine nouns, all of them extremely small in terms of membership. According to Pavlov (1995: 46), more than 95% of feminine nouns choose the majority pattern  $-/(e)n$ . While the fact that a noun is feminine allows us to predict its paradigm in almost all cases, this is not the case for masculine or neuter nouns where we find several ICs with a substantial membership.

We now turn to the other direction. If we know how a noun inflects, how reliably can we predict its gender? For at least four ICs, gender can unambiguously (or nearly unambiguously) be predicted from IC, e.g. all nouns of IC  $-/(e)n$ , i.e. the class that *Biene* ‘bee’ belongs to, are feminine. Then there are several ICs whose nouns cannot be feminine. For instance, we can predict that *der Knauf* ‘knob’ (a masculine noun following inflection class  $-(e)s/U-e$ , U indicating umlaut) cannot be feminine based on its paradigm. To tell masculine nouns apart from neuter nouns can be less straightforward, but often further phonological cues help (see §4).

## 4 Phonological assignment

Köpcke (1982) and Köpcke & Zubin (1983) establish a number of phonological rules to account for the gender of monosyllabic nouns. For example, almost all monosyllabic nouns starting with the cluster /kn/ are masculine (93%), e.g. *der Knauf* ‘knob’, *der Knick* ‘crease’, the only exception being the neuter noun *das Knie* ‘knee’. The great majority of nouns ending in /et/ are neuter (86%), e.g. *das Duett* ‘duet’, an exception being *der Anisett* ‘anisettes’. The majority of nouns which end in the specific clusters /ft/, /xt/ or /çt/ are feminine (64%), e.g. *die Zunft* ‘guild’, *die Frucht* ‘fruit’, *die Sicht* ‘visibility’, an exception being *der Duft* ‘smell’. And in general, the more consonants a monosyllabic noun has in its onset or coda, the higher the probability that the noun is masculine. These phonological assignment rules are not exceptionless, but in comparison to the overall numbers in Table 1, they have some value.

## 5 ‘Crazy’ rules

Semantic non-core rules, termed ‘crazy’ rules by Enger (2009), add a new dimension to gender assignment. They involve semantic clusters; for example, nouns denoting alcoholic

beverages are masculine, introvert affect nouns are feminine, and basic chemical elements are neuter (Köpcke & Zubin 1984, 1996, Zubin & Köpcke 1984). These are only tendencies, with exceptions, e.g. the neuter alcoholic drink *das Bier* 'beer'. Moreover, in contrast to semantic assignment rules, crazy rules can be overridden by form, e.g. the extrovert affect noun *die Streng* 'sternness' should be masculine by 'crazy' rule, but is in fact feminine because it belongs to a class of (no longer productive) deadjectival derivations in *-e* (from *streng* 'stern'), which are all feminine.

## 6 Conclusion

The German gender system involves many interacting regularities, of different types: semantic, phonological, morphological and 'crazy' rules. We suggest that progress can be made by treating the system as a whole and by putting numbers to assignment rules so that we can evaluate their effectiveness. We reaffirm the unique typological interest of the German gender system, and make modest progress in illuminating it.

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