The interpretation of masculine personal nouns in German and Dutch: A comparative experimental study

Maarten De Backer (= Corresponding author)
Research Fellow of the Research Foundation Flanders (FWO)
Ghent University
Faculty of Arts and Humanities
General Linguistics
Blandijnberg 2
B-9000 Gent (Belgium)
M.DeBacker@UGent.be
Tel. +32 (0)9 33 12 952

Ludovic De Cuypere
Postdoctoral Fellow of the Research Foundation Flanders (FWO-Vlaanderen)
Ghent University
Faculty of Arts and Humanities
General Linguistics
Blandijnberg 2
B-9000 Ghent (Belgium)
Ludovic.DeCuypere@UGent.be
Tel. +32 (0)9 33 12 950

Abstract[1]

In both German and Dutch, masculine personal nouns (e.g., *smoker*, *winner*, and *therapist*) can be used either generically, i.e., referring to both women and men, or specifically, i.e., referring to only men. Regarding German, research indicates that generic uses of masculine personal nouns are strongly male-biased in comparison with alternative generics (Klein, 1988; Scheele & Gauler, 1993; Irmen & Köhncke, 1996; Braun et al., 1998; Stahlberg et al., 2001; Stahlberg & Sczesny, 2001). In Dutch, masculine terms and neutralising terms are reported to be increasingly used in reference to both women and men (Gerritsen, 2002). This study investigates, by means of two survey experiments, (i) how German and Dutch native speakers interpret masculine personal nouns used in a referential context, (ii) which variables this interpretation is associated with (including subject gender, number, definiteness, type of lexical unit, and relative frequency), and (iii) how the participants evaluate the referential possibilities of these nouns. Firstly, the results of the study indicate that masculine personal nouns are more frequently interpreted as gender-specific terms in German than in Dutch. Secondly, the interpretation of the German and Dutch nouns is found to be significantly associated with the following variables: number, lexical unit type, and relative frequency. Thirdly, German masculine personal nouns appear to be more restrictive in terms of potential references than their Dutch counterparts. In general, the data indicate that there is a clear difference between German and Dutch regarding the interpretation of masculine personal nouns, but this difference is particularly apparent in the singular.

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1. Introduction

In both German and Dutch, masculine personal nouns have a dual potential for reference: they can be used either generically, i.e., in reference to persons irrespective of their natural gender, or specifically, i.e., in reference to males. The generic use of masculine nouns, also known as the *generic masculine*, has been a key issue in feminist language critiques (Trömel-Plötz, 1978; Ulrich, 1988; Hellinger, 1990; Braun, 1991; Doleschal, 1998, among others, for German; Rubinstein, 1979; van Alphen, 1983; Verbiest, 1991, 1997; Sneller & Verbiest, 2000; Mortelmans, 2008, among others, for Dutch). In particular, these authors argue that masculine generics, as in (1) and (2), contribute to the linguistic under-representation of women:

(1) *Jeder* ***Raucher*** *weiß, dass seine Gewohnheit schädlich ist.* (Niederösterreichische Nachrichten, 04.11.2008)
'Every smoker (masc.) knows that his habit is harmful.'

(2) *De* ***winnaar*** *mag optreden tijdens het festival in Groningen.* (38 Miljoen Woordencorpus, MCDEC92OVE.SGZ)
'The winner (masc.) may perform during the festival in Groningen.'

To prevent women from being linguistically ignored, the replacement of generic masculines with other, "non-sexist" expressions has been suggested (Bußmann & Hellinger, 2003, pp. 154-157; Braun et al., 2005, p. 3; Lievens et al., 2007, pp. 21-23). Generally, two alternatives are available. *Neutralising* strategies involve the use of a single term that does not differentiate gender, as illustrated in (3) to (5):

(3) epicene nouns (cf., Corbett, 1991, p. 67): *die Führungskraft*/*de bewindspersoon* 'the member of government'
(4) non-differentiating forms: *die Angestellten* (plural of both *die Angestellte* 'the female employee' and *der Angestellte* 'the male employee'), *de computerdeskundige* 'the computer expert'
(5) collectives: *das Personal*/*het personeel* 'the staff'

In contrast, *feminising*, or *differentiating*, forms overtly mark the presence of women:

(6) long splitting*: jeder Student und jede Studentin*/*elke student en studen*te 'every (male and female) student'
(7) short splitting: *WählerInnen* 'voters', *Apotheker/innen* 'pharmacists', *jedeR* 'each', *elke student(e)* 'every (male and female) student'[2]

[2] These alternatives are restricted to written language. Moreover, Häberlin et al. (1992) criticise these forms because they are difficult to pronounce and distort orthographic continuity (cf., Bußmann & Hellinger, 2003, p. 155).

(8) adjectival modification: *männliche und weibliche Teilnehmer*/*mannelijke en vrouwelijke deelnemers* 'male and female participants'

For German, a number of empirical studies have been conducted to investigate the effects of the various types of generics (masculine, neutralising, and feminising generics) on the cognitive inclusion of women (Klein, 1988; Scheele & Gauler, 1993; Irmen & Köhncke, 1996; Braun et al., 1998; Stahlberg et al., 2001; Stahlberg & Sczesny, 2001).[3] Using different research techniques (sentence completion task, reaction time measurement, reading task, and questionnaire), all of these studies arrive at similar conclusions: masculine generics trigger the lowest or slowest cognitive inclusion of women, whereas alternative generics lead to a higher or faster cognitive representation of women. According to Bußmann & Hellinger (2003, p. 160), this finding is indicative of the fact that masculine personal nouns in German "are losing some of their (alleged) 'generic' potential and are becoming more male-specific." They mention that there is a growing tendency in present-day German to enhance female visibility by means of feminisation. The choice for this strategy is a consequence of several factors (Bußmann & Hellinger, 2003, p. 166)[4]: the existence of a productive feminising suffix *–in*, the increasing congruence in current German between grammatical and natural gender, and the implementation of official language regulations favouring gender specification in contexts that include women. However, it should be noted that in practice, the use of feminine forms is largely restricted to contexts of individual female reference (cf., Lutjeharms, 2004, p. 196). When reference is made to a group of people (e.g., *Viele Studenten haben gestern in Dresden demonstriert* 'Many students demonstrated in Dresden yesterday') or to a particular category (e.g., *Wie viel kostet ein Student durchschnittlich im Jahr?* 'How much does a student cost on average per year?'), the generic masculine is still preferred (Stuckard, 2000).

For Dutch, a systematic empirical investigation into generics has not yet been performed. The existing literature has mainly focused on more theoretical issues regarding the morphology, semantics, and pragmatics of masculine and feminine personal nouns (De Caluwe & van Santen, 2001; Gerritsen, 2002, pp. 81-108; van Santen, 2003, pp. 7-26; Lutjeharms, 2004, pp. 202-205; Lievens et al., 2007, pp. 19-26 and Mortelmans, 2008, pp. 7-19). With respect to the use of the various types of generics, there does not appear to be a clear preference in Dutch for either

[3] Detailed discussions of these empirical studies are found in Bußmann & Hellinger (2003, pp. 160-161) and Braun et al. (2005). Therefore, we refrain from providing an extensive overview here.

[4] For a historical account of this German tendency, see Kastovsky & Dalton-Puffer (2002, pp. 285-296).

feminising or neutralising forms to avoid "sexist" language. Contrary to German, there are no official guidelines recommending either feminising or neutralising strategies in Dutch. Another difference is that in Dutch, for a considerable number of lexical units, feminising (9) or neutralising alternatives (10) do not exist or are of questionable acceptability:

(9) *therapeut* '(male) therapist' – *therapeute* 'female therapist', but *arts* '(male) doctor' – **artse* 'female doctor', *rechter* '(male) judge' – **rechtster* 'female judge'

(10) *leerkracht* 'teacher' vs. *leraar* 'male teacher' and *lerares* 'female teacher', but **weerpersoon/-mens* 'weather forecaster' vs. *weerman* 'male weather forecaster' and *weervrouw* 'female weather forecaster'.

Consequently, there is significant variation depending on the lexical unit, context, and individual speaker. Gerritsen (2002, pp. 102-105) reports that masculine terms (e.g., *medewerker* '(male) co-worker') and neutralising terms (i.e., nouns that have no feminine counterpart, such as *arts* 'doctor', or are inherently gender-neutral, e.g., *hoofd* 'head') are increasingly used in reference to both women and men. This finding is consistent with the claim advanced by several authors that there has been a decrease in the number of productive feminising suffixes in Dutch (e.g., Lutjeharms, 2004, p. 205).

Despite the continuing debate on gender-fair language use in both German- and Dutch-speaking countries, the question of how masculine personal nouns are actually interpreted by German and Dutch native speakers has yet to be examined in a focused empirical study. For Dutch, solid empirical research is simply lacking altogether. Although a substantial body of research exists for German, these studies have thus far only examined the impact of masculine generics on the cognitive availability of the concepts "male" and "female" in comparison to other types of generics. However, the attestation that masculine generics produce a stronger male bias than feminising or neutralising generics is uninformative regarding the conditions under which a gender-specific or gender-neutral interpretation of masculine personal nouns occurs.

This article focuses on the interpretation of masculine personal nouns by German and Dutch native speakers. We hypothesise that the interpretation of masculine personal nouns in actual language use is largely motivated by a number of linguistic and non-linguistic features. The aim of this study was to determine the influence of these features by means of a carefully designed questionnaire study. The features that we examined included the *type of lexical unit*, *number*, *definiteness*, *relative frequency of the lexical unit*, and *gender of the subjects*.

A comparison between German and Dutch is particularly interesting, as both languages are closely related from a typological viewpoint but have a different grammatical gender system: whereas German has a three-gender system, distinguishing between masculine, feminine, and neuter, Dutch only has two grammatical genders, combining masculine and feminine as a common gender.

Table 1 illustrates the differences between German and Dutch in terms of morphological gender marking. In German, modifying or dependent elements such as articles, adjectives, and pronouns exhibit morphological variation in the singular, depending on the noun specified, cf., *der große Mann* ('the tall man') vs. *ein großer Mann* ('a tall man'). In Dutch, by contrast, the distinction between masculine and feminine in the singular is marked on personal and possessive pronouns but not on articles and adjectives, cf., *de/een grote man* ('the/a tall man').[5] The gender distinction is not marked in the plural form in either language.

	Masculine singular		
	Definite	**Indefinite**	**Personal Pronoun**
Dutch:	de grote man	een grote man	hij
German:	der große Mann	ein großer Mann	er
	'the tall man'	'a tall man'	'he'

	Feminine singular		
	Definite	**Indefinite**	**Personal Pronoun**
Dutch:	de grote vrouw	een grote vrouw	zij
German:	die große Frau	eine große Frau	sie
	'the tall woman'	'a tall woman'	'she'

	Neuter singular		
	Definite	**Indefinite**	**Personal Pronoun**
Dutch:	het grote gebouw	een groot gebouw	het
German:	das große Gebäude	ein großes Gebäude	es
	'the tall building'	'a tall building'	'it'

	Feminine/Masculine/Neuter plural	
	Definite/Indefinite	**Personal Pronoun**
Dutch:	(de) grote mannen/vrouwen/gebouwen	zij
German:	(die) große(n) Männer/Frauen/Gebäude	sie

[5] The use of the uninflected adjective form, e.g., *een groot man* ('a tall man'), is possible in Dutch but entails a semantic difference. *Een grote man* refers to a man tall in height, whereas *een groot man* refers to a tall man in a figurative sense, for instance, a man of large historical importance. Note that *een groot vrouw* is less acceptable in Dutch.

'(the) tall men/women/buildings'	'they'

Table 1: Gender marking in Dutch and German

Given the higher degree of morphological differentiation between masculine and feminine in German as well as the possibility to feminise almost all personal nouns morphologically (with the suffix *–in*), we expect that grammatical gender and natural gender are more strongly associated in German than in Dutch and that accordingly, grammatically masculine personal nouns are more frequently interpreted as gender-specific (i.e., as 'referring to a male') in German than in Dutch.

The remainder of this article is structured as follows. In Section 2, the methodological design of our experiment is explained, and hypotheses are formulated. The results of our study are presented and discussed in Section 3. Section 4 provides a brief summary of our main conclusions.

2. Methodology and hypotheses

2.1. Questionnaire design and subject sample

To compare German and Dutch interpretations of masculine personal nouns, we conducted an experiment among 64 native speakers of German and 64 native speakers of Dutch.[6] Each group consisted of 32 female and 32 male participants. All subjects were students of linguistics between 19 and 28 years old at the University of Tübingen (for the German sample)[7] and the University of Ghent (for the Dutch sample). The experiment was administered in the form of a questionnaire, which was produced in both languages and answered anonymously. The data were collected by means of an online survey created using the open source application Limesurvey. An email was sent to the participants, which provided them with a hyperlink to the questionnaire. The answers of the completed questionnaires were exported to Excel, where they were annotated according to the variables in which we are interested, including type of lexical unit, number, definiteness, relative frequency, and gender of the subjects (cf., Section 2.2). All statistical data analysis was performed with SPSS 19.

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[6] The experimental subjects in the present study were native speakers of *Belgian* Dutch (Flemish). One should thus be careful in extrapolating the results obtained in our experiment to speakers of Dutch in the Netherlands (*Hollandic* Dutch).

[7] We would like to thank Daniel Steiner and Johannes Kabatek for recruiting participants at Tübingen University.

The questionnaire involved two tasks. In the first task, participants were asked to interpret masculine personal nouns by answering the following multiple-choice question: "What is the natural gender of the referent(s) which the underlined noun refers to in the given context?" The possible answers were "male", "female", or "male and/or female" (§ 2.2). In the second task, subjects were invited to respond to further questions according to the answers they gave in the first assignment (§ 2.3).

2.2. Task 1

In the first task, 22 stimulus sentences were presented to the participants, of which 16 sentences included a personal noun that was morphologically masculine. Because the answer to these experimental sentences was expected to be either "male" or "male and/or female", 6 filler sentences were randomly inserted with a personal noun that was morphologically feminine. These fillers were included to ensure that the participants would occasionally have a clear incentive to mark the answer option "female". The feminine nouns that were used in these sentences are specified in Table 2.[8]

German	**Dutch**	**English**
Journalistin	*journaliste*	'female journalist'
Sängerin	*zangeres*	'female singer'
Fahrerin	*bestuurster*	'female driver'
Trinkerin	*alcoholiste*	'female alcoholic'
Ministerin	-	'female minister'
Wählerin	-	'female voter'
-	*agente*	'female cop'
-	*acrobate*	'female acrobat'

Table 2: Feminine nouns used in the questionnaire as fillers

The responses to these feminine forms were excluded from the statistical analysis, as we were specifically interested in the speaker's interpretation of the morphologically masculine items.

We also excluded generic contexts such as *Ärzte haben ein hohes Einkommen/Artsen hebben een hoog inkomen* ('Doctors have a high income'), which receive a generic interpretation by default from the questionnaire. All sentential contexts included in the questionnaire involved referential contexts, i.e., contexts in a specific spatio-temporal setting with one or more specific referents.

[8] The Dutch questionnaire was modelled on the German version, and because the feminine counterparts of *minister* 'minister' (**ministerin*) and *kiezer* 'voter' (**kiezeres*) do not exist in Dutch, two different nouns were chosen.

Finally, non-linguistic factors such as ontological frequency (i.e., frequency in the world, Haspelmath, 2006, p. 21) and gender stereotypes were controlled as much as possible. Thus, nouns carrying a male or female bias because they refer to an occupation or activity that is traditionally performed by more men than women (e.g., *soldier*), or vice versa (e.g., *nurse*), or contexts containing gender-stereotypical information (e.g., someone repairing a car or doing the laundry) were omitted from the experiment. Other non-linguistic variables, such as age and educational background, were controlled through the choice of the subjects.

In the following sections, the variables that were used in our experimental design are discussed along with the hypothesised effects.

2.2.1. Interpretation (outcome variable)

This categorical variable contains three levels associated with the possible answers that the subjects could give to each test sentence. The interpretation was coded as "non-neutral" (i.e., gender-specific) if "male" was selected and "neutral" (i.e., gender-neutral) if "male and/or female" was selected. The answer "female" was only relevant for the filler sentences and is therefore not included in our data analysis (no subject selected "female" in response to a masculine personal noun).

2.2.2. Type of lexical unit

The personal nouns that were used in the 16 experimental sentences were of two types: occupational vs. non-occupational. Occupational nouns are defined as personal nouns that refer to the agent of a certain professional occupation, such as *politician*, *doctor*, *and actor*. Non-occupational nouns are personal nouns that refer to the agent of a more general action, such as *visitor*, *spectator*, *and reader*. Table 3 presents an overview of the occupational and non-occupational items that were used in the experiment.

	German	**Dutch**	
Occupational:	*Apotheker*	*apotheker*	'pharmacist'
	Arzt	*arts*	'doctor'
	Assistant	*assistent*	'assistant'
	Athlet	*atleet*	'athlete'
	Künstler	*kunstenaar*	'artist'
	Musiker	*muzikant*	'musician'
	Politiker	*politicus*	'politician'
	Schauspieler	*acteur*	'actor'

Non-occupational:	*Abonnent*	*abonnee*	'subscriber'
	Begleiter	*begeleider*	'companion'
	Besucher	*bezoeker*	'visitor'
	Bewohner	*bewoner*	'inhabitant'
	Leser	*lezer*	'reader'
	Mieter	*huurder*	'tenant'
	Schüler	*leerling*	'pupil'
	Zuschauer	*toeschouwer*	'spectator'

Table 3: German and Dutch occupational and non-occupational items used in the experiment

We expected occupational nouns to be positively associated with a gender-specific (i.e., male) interpretation based on the assumption that these terms more readily conjure up the image of a specific (in this case, usually male) individual.

2.2.3. Number and Definiteness

To examine the influence of number (singular or plural) and definiteness (definite or indefinite), each noun was presented in four different contexts, viz. singular + definite, singular + indefinite, plural + definite, and plural + indefinite.[9] To avoid participants having to respond more than once to the same noun in the first task of the questionnaire, four versions of the questionnaire, differing only with respect to the number and definiteness of the personal nouns under investigation, were designed as illustrated in (11).

(11) Q1. ***Der Besucher*** *aus Taiwan war vor allem an der Berliner Architektur interessiert.*
De bezoeker *uit Taiwan was vooral in de Berlijnse architectuur geïnteresseerd.*
'**The visitor** from Taiwan was especially interested in the Berlin architecture.'
Q2. ***Ein Besucher*** *aus Taiwan war vor allem an der Berliner Architektur interessiert.*
Een bezoeker *uit Taiwan was vooral in de Berlijnse architectuur geïnteresseerd.*
'**A visitor** from Taiwan was especially interested in the Berlin architecture.'
Q3. ***Die Besucher*** *aus Taiwan waren vor allem an der Berliner Architektur interessiert.*
De bezoekers *uit Taiwan waren vooral in de Berlijnse architectuur geïnteresseerd.*
'**The visitors** from Taiwan were especially interested in the Berlin architecture.'
Q4. ***Besucher*** *aus Taiwan waren vor allem an der Berliner Architektur interessiert.*
Bezoekers *uit Taiwan waren vooral in de Berlijnse architectuur geïnteresseerd.*
'**Visitors** from Taiwan were especially interested in the Berlin architecture.'

Thus, each version of the questionnaire consisted of an equal number of singular definite, singular indefinite, plural definite, and plural indefinite personal nouns. The four questionnaires were evenly distributed to female and male participants (i.e., 16 participants per questionnaire version, consisting of 8 females and 8 males). Our hypothesis was that singular nouns would be

[9] This is also the reason that both variables are discussed together in one subsection rather than separately.

positively associated with a non-neutral interpretation (or conversely, that plural nouns would be positively associated with a neutral interpretation). We also expected that definite nouns would tend to be interpreted more frequently as non-neutral rather than indefinite nouns.

2.2.4. Relative frequency

The relative frequency of the masculine nouns was defined as the ratio between the absolute frequency of the masculine nouns and the absolute frequency of their feminine counterparts (if such a counterpart exists).[10] The absolute frequency of the German and Dutch masculine nouns was collected from *Cosmas II* and the *38 Miljoen Woordencorpus*, respectively.

An overview of the relative frequencies is presented in Table 4.

German	RF	Dutch	RF
Zuschauer	85	**apotheker**	–
Besucher	30	**abonnee**	–
Abonnent	29	**arts**	–
Politiker	18	**toeschouwer**	1498
Musiker	15	**huurder**	416
Mieter	14	**leerling**	226
Bewohner	14	**muzikant**	194
Arzt	13	**bezoeker**	64
Leser	7	**lezer**	44
Apotheker	6	**politicus**	44
Athlet	6	**bewoner**	40
Schüler	5	**kunstenaar**	11
Begleiter	5	**begeleider**	10
Künstler	4	**assistent**	7
Assistant	4	**atleet**	4
Schauspieler	3	**acteur**	2

Table 4: Relative frequencies (RF)

The nouns in Table 4 are ranked according to their relative frequency (from high to low). A relative frequency of 2 for *acteur*, for example, means that the masculine term is twice as frequent in the corpus sample as its feminine counterpart.

If we compare the German relative frequencies with the median relative frequency of the Dutch nouns (*politicus*, 44), it appears that *Zuschauer* (85) is the only item that ranks higher than

[10] The relative frequencies of *apotheker* 'pharmacist', *abonnee* 'subscriber', and *arts* 'doctor' could not be calculated because a feminine alternative did not occur in the corpus. This might be because the feminine form simply does not exist (in the case of *arts* and *abonnee*) or because it is not standard Dutch (*apothekeres* is possible in dialectal use, particularly by older people, but is being suppressed by *apotheker*).

the median relative frequency of the Dutch items. This implies that the high relative frequencies in German are generally far below those in Dutch. It appears likely that these differences in relative frequencies between Dutch and German, which are actual usage differences, also affect the interpretation of these items. We hypothesised that a low relative frequency is indicative of a more pronounced opposition between masculine and feminine. Therefore, a low relative frequency was expected to correlate with a non-neutral interpretation. Conversely, a high relative frequency implies that the feminine term is far less frequent than its masculine opposite (or does not even exist in some cases). Accordingly, it was hypothesised that a high relative frequency should correlate with a neutral interpretation.

Because the Dutch masculine forms are far more frequent than the German items (that is, relative to their feminine counterparts), we specifically hypothesised that Dutch items would be understood more frequently as gender-neutral terms than their German equivalents.

2.2.5. Subject's gender

The only non-linguistic variable that we examined is the natural gender of the experimental subjects (two levels: male or female). Massner (2010, p. 62) argues that women are more sensitive to gender distinctions. Accordingly, we hypothesised that women are more inclined to assign a gender-specific interpretation to the experimental masculine personal nouns.

2.3. Task 2

In the second task, subjects were presented with additional questions that pertained to their answers in the first task.

- If the answer to the first question was "male" or "female" in response to a singular noun, then participants were asked in the second task whether it would be possible to use the underlined noun in the given context to refer to a female or male person.
- If the answer to the first question was "male" or "female" in response to a plural noun, then participants were first asked whether it would be possible to use the underlined noun in the given context to refer to a group consisting only of females or a group consisting only of males. Secondly, they were asked whether it would be possible to use the underlined noun in the given context to refer to a group consisting of both males and females.

In this set of additional questions, participants could assess the degree of possibility on a four-point Likert scale: “certainly possible” (1), “possible, but unusual” (2), “hardly possible” (3), or “certainly not possible” (4).

– If the answer to the first question was “male and/or female” in response to a singular or a plural noun, participants were then asked whether they nonetheless preferred either of the natural genders. Possible answers to this additional question were “male”, “female”, or “no preference”.

As we were only interested in the responses to the morphologically masculine personal nouns, the answers to the questions in the second task that related to a feminine personal noun in the first task were excluded from the analysis. Contrary to the first task, which was created to determine participants’ spontaneous interpretations, the second task was designed to assess participants’ perceptions of the referential possibilities of the masculine personal nouns at hand. We hypothesised that the higher degree of gender-neutrality of Dutch masculine personal nouns, which we already expected to observe in the first task, should also be clear in the second task. First, the degree of possibility of initial “male” responses to also refer to female persons was considered to have a higher average score in German than in Dutch (reflecting a lower degree of possibility). In addition, the number of participants selecting the answer options (1) and (2) in the additional questions of initial “male” responses (which indicates a high degree of possibility) was predicted to be lower in German than in Dutch. Second, regarding the answer to the question whether there would be a preferential interpretation if the answer in the first task was “male and/or female”, we expected that there should be a stronger “male” preference in German than in Dutch.

It should be noted that our experiment was methodologically informed by Massner (2010). Massner (2010) confronted participants with a series of sentences that they were required to assign to one of the following categories: “Mann” ‘man’, “Frau” ‘woman’, “Mann und/oder Frau” ‘man and/or woman’ or “weiß nicht” ‘do not know’.[11] The aim of Massner’s study was to investigate a wide variety of variables that might affect participants’ interpretations of masculine personal nouns and pronouns. Unfortunately, however, the design of Massner’s study was not

[11] The category “do not know” was deliberately omitted from the answer possibilities in our experiment. In our view, this fourth category might have caused some confusion because it might not have been entirely clear to the participants what the actual difference is between stating that you do not know what the gender of the referent is and stating that it can be either male or female.

overly careful. The linguistic variables, such as type of context (referential or generic), type of lexical unit (occupational or non-occupational), number (singular or plural), and definiteness (definite or indefinite), were unevenly distributed among the experimental sentences. The non-linguistic variables, such as gender and age of the participants, were neither controlled nor systematically varied. The conclusions drawn in that study were thus statistically inadequate. For instance, Massner (2010: 62) argues that the generic masculine produces a stronger "male" bias for women than for men based on only two examples in which female participants favoured the answer "man", whereas male participants favoured the answer "man and/or woman". A closer examination of the answers to the other experimental sentences, however, reveals that this tendency does not hold for many other sentences.

In the following section, the results of our questionnaire study are discussed, beginning with the results of the first task of the questionnaire in Section 3.1. A discussion of the results of the second task is presented in Section 3.2.

3. Results

3.1. Task 1

As outlined in the previous section, the main purpose of this part of the experiment was to test the influence of various variables on the interpretation of masculine personal nouns by German and Dutch speakers. Because we are particularly interested in evaluating the effects of the variables simultaneously, our data analysis requires a statistical method that allows one to draw such conclusions. One multivariate analysis method that is well suited for our purposes is the classification tree analysis.

Classification trees serve a variety of purposes. We specifically chose this method because it allows for a straightforward interpretation of the various interactions between the predictor variables. Another attractive feature of creating a classification tree is that the analysis results (if certain variables turn out to be significant) in a set of specific prediction rules with specified outcome probabilities, both of which can easily be verified by replication.

There are a number of growing methods available for the creation of a classification tree, each having its own advantages and disadvantages. We fitted our classification tree models by means of *IBM SPSS Statistics 19* (2010). This statistical software program provides four different

growing procedures: CHAID, exhaustive CHAID, CRT and QUEST.[12] The classification trees that are discussed in this section were built by means of the CHAID procedure. This procedure provided us with the most adequate prediction models based on three evaluation criteria. The most adequate model should yield the best overall prediction accuracy for the samples under analysis, should have the lowest risk of misclassification (after cross-validation), and should be easy to interpret (simpler models are generally preferred over more complex models)

Two classification models – one for each language – are subsequently discussed in the next subsections.[13]

[12] For more information on the various growing methods, we refer to the user's manual *IBM SPSS Regression Trees 19*, IBM Inc. 1989, 2010.

[13] Here are some additional details about the specific method used that are important for replication studies. Validation method: cross-validation (number of sample folds: 10). Growing method: Maximum tree depth: automatic (3 by default); Minimum number of cases: 100 for parent node, 50 for child node; Significance level for splitting nodes: 5%; Chi-square statistic: Pearson; Maximum number of iterations for model estimation: 100; Minimum change in expected cell frequencies 0.0001; Bonferroni significance adjustment; Equal costs.

3.1.1. Classification tree 1: German dataset

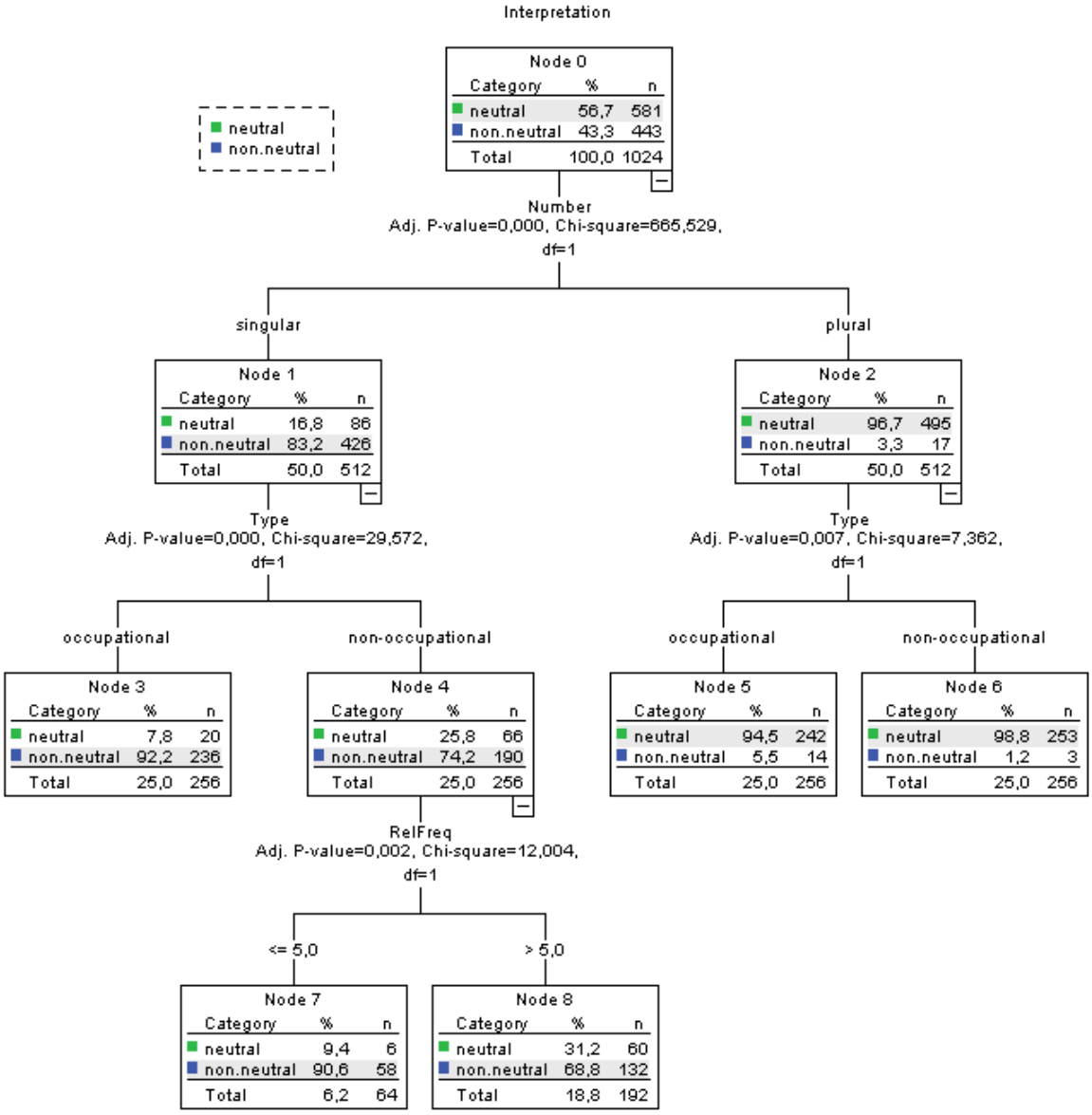

Figure 1: Decision tree model for the German dataset

This classification tree has a risk estimate of approximately 10% after cross-validation (Standard Error = 0.009). This suggests that the model offers a very good prediction of the German speakers' interpretations based on the variables that are included in this classification tree.

The tree diagram outlined in Figure 1 indicates that the interpretation of masculine personal nouns by German speakers was primarily associated with the variable number.[14] The direction of the association was also in line with what we hypothesised: a plural noun is nearly always interpreted as neutral (97% probability, the predicted category is highlighted), whereas a singular tends to be interpreted as non-neutral (83%).

Lexical unit type was the second best predictor. With singular nouns, an occupational noun had a larger probability of being interpreted as non-neutral than a non-occupational noun, with probabilities of 92% and 74%, respectively. The additional effect of lexical unit type on plural nouns was minor, yet the total probabilities were substantial: a plural noun of a non-occupational type had a probability (in this dataset) of 99% of being interpreted as neutral, whereas the probability of an occupational noun was 94%, which is obviously still very high. The effect of lexical unit type was also in line with what we expected.

One might, perhaps, counter the latter conclusion by arguing that the high probability of occupational nouns to be interpreted as neutral refutes our hypothesis that occupational terms are preferably interpreted as non-neutral. Note, however, that 94% is the combined probability of plural and occupational rather than the probability of occupational nouns as such. Within the category of plural nouns, we observed that 14 occupational nouns were interpreted as non-neutral. This observed frequency is significantly more than what would be expected if lexical unit type and interpretation were not associated. The expected frequency for this cell is 8.5 (expected frequencies are not indicated in the tree diagram but are easily computed [(256*17)/512 = 8.5]. Clearly, the difference between the observed and expected frequencies was not high. As may be expected, the strength of the association was actually very low (Cramér's V = 0.11).

[14] The strong effect of number is also found in the other growing methods. We should also mention at this stage that a logistic regression analysis of the data would also be feasible, which we also conducted during the course of our research. Number and lexical unit type also proved significant in this analysis ($p < 0.000$), with odds ratios of 0.029 (for plural) (C.I.: 0.019–0.043) and 0.309 (for non-occupational) (C.I.: 0.218–0.439) (reference value: non-neutral). Thus, based on this logistic regression analysis, the odds of a plural noun being interpreted as non-neutral were approximately 2% of those of singular (i.e., very unlikely); the odds of a non-occupational term being interpreted as non-neutral were approximately 30% of those of an occupational term (the impact effect is, accordingly, less strong than for number). Notwithstanding the acceptable quality of this logistic regression model (Hosmer-Lemeshow > 0.05, Nagelkerke $R^2 = 0.523$, the correct classification score of 80% in comparison to a baseline prediction of 63%), we prefer the classification analysis, as it allows for a more detailed exploration of tendencies involved in the speaker's interpretation. The estimated odds ratios provided by the logistic regression analysis (one of the advantages of a logistic regression analysis) are certainly interesting, but we find them less informative than the interactions found in the classification model.

For non-occupational nouns in the singular, the best next predictor was the variable relative frequency. Interestingly, a singular noun (which tends to be interpreted as non-neutral) of the occupational type still had a 26% chance of being interpreted as neutral, and this probability increased for nouns with a relative frequency of more than 5, which applies to more than half of the items under analysis. For nouns with a relative frequency of less than 5, conversely, the probability of a non-neutral interpretation was 90%. This corroborates our hypothesis that masculine nouns with a low relative frequency tend to be associated with a non-neutral interpretation, as a low frequency may be considered indicative of a more pronounced distinction between masculine and feminine (remember that a low relative frequency means that the morphologically feminine counterpart is frequently used).

All of the effects of the variables included in this classification model are in line with the hypotheses that we tested in the previous section. The effects remain as expected, even in interaction with other variables. Thus, an occupational noun in the plural is less likely to be interpreted as neutral than a non-occupational noun in the plural. These interaction effects make this statistical method very useful for our purposes.

Two variables did not contribute significantly to our model: subject gender and definiteness. Based on this model and the results of our experiment, we have no evidence that these variables influence the interpretation of masculine nouns by German speakers.

3.1.2. Classification tree 2: Dutch dataset

The misclassification risk of the classification tree for our Dutch dataset was 15% (Standard Error = 0.011) and was thus somewhat larger than that for German, which means that this model's prediction accuracy is slightly worse than that for German.[15]

The same tendencies as those observed for German were found for Dutch. Firstly, we found that the same three variables that are included in the classification tree for German are also involved in Dutch, namely, number, lexical unit type, and relative frequency. No evidence was found for the variables subject gender and definiteness. Secondly, the same general tendencies of

[15] A logistic regression analysis of the data was performed, and it was significant for two variables: lexical unit type and number ($p < 0.000$). Odds ratios: 0.010 for plural (C.I.: 0.06–0.018) and 0.149 (for non-occupational) (C.I.: 0.88–0.251) (reference value: non-neutral). Thus, the odds of a plural noun being interpreted as non-neutral was approximately 1% of the odds of singular (i.e., very unlikely), whereas the odds of a non-occupational term being interpreted as non-neutral was approximately 15% of the odds of an occupational term (also unlikely). The model quality was also good (Hosmer-Lemeshow > 0.05; Nagelkerke $R^2 = 0.660$; the model has a correct classification score of 85.5% (baseline = 59%).

prediction as those found for German were observed for Dutch (cf., **Fout! Verwijzingsbron niet gevonden.**).

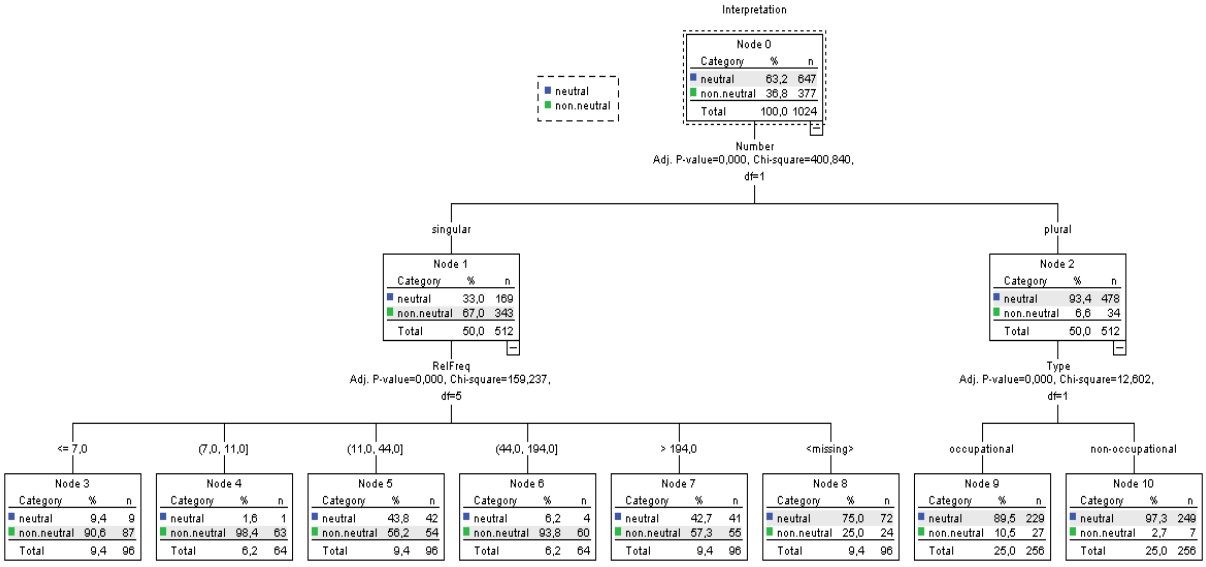

Figure 2: Decision tree model for the Dutch dataset

Regarding the main results, number was the best predictor of interpretation, with plural nouns preferably interpreted as neutral (93%) and singular nouns as non-neutral (67%). For plural nouns, the second best predictor was lexical unit type. Plural occupational nouns and non-occupational nouns had a probability of approximately 90 and 97%, respectively, of being interpreted as neutral.

For the singular nouns, relative frequency was the only significant predictor of the outcome variable interpretation. A comparison between the highest and lowest relative frequencies suggests that a high relative frequency (cf., "missing") is associated with a high probability of being interpreted as neutral, and a low relative frequency is associated with a high probability of being interpreted as non-neutral (cf., ≤ 7).[16] Notice, however, that relative frequencies of more than 11 did not have a straightforward effect on the interpretation; whereas 94% of the nouns with a relative frequency within the range (44, 194] were interpreted as non-neutral, nouns with a relative frequency within the range of (11, 44] and higher than 194 had only slightly more than a 50% probability of being interpreted as such. Hence, there is no simple correlation between a noun's relative frequency and its interpretation as either gender-specific or gender-neutral.

[16] (x, y] reads as higher than, but not similar to, x and lower than or similar to y.

3.1.3. Discussion

A comparison of the German and Dutch decision trees reveals that neutral interpretations are generally more frequent than non-neutral interpretations in both German and Dutch. As we expected, the total number of neutral interpretations was higher in Dutch than in German (647 instances, or 63%, vs. 581 instances, or 57%), although the difference between both datasets was relatively small (only 66, or 6.5%, more neutral responses in Dutch than in German). The results of both experiments also confirmed our hypothesis that the interpretation of masculine personal nouns is associated with various factors. In both German and Dutch, number was the best predictor of interpretation; singular nouns tended to be interpreted as non-neutral, whereas plural nouns tended to be interpreted as neutral. A particularly interesting observation is that the Dutch masculine singular nouns were still interpreted as neutral in 169 instances (or 33%), which is almost twice as much as their German equivalents (86 instances, or 17%). This finding is consistent with our hypothesis that in Dutch, masculine personal nouns display a higher degree of gender-neutrality than in German. In the plural, the same tendencies were observed for both German and Dutch, viz., a clear preference for neutral interpretations, which was slightly more pronounced in German (97%) than in Dutch (93%). In both German and in Dutch, plural nouns of the non-occupational type were more likely to be interpreted as neutral than plural nouns of the occupational type, which is again in line with our initial hypothesis.

The observation that German plural masculine nouns had a 97% probability of being interpreted as neutral challenges the claim made by Bußmann & Hellinger (2003, p. 158) that there is a male bias in examples such as (12):

(12) *45 Millionen Bürger sind zur Bundestagswahl aufgerufen.*
'45 million citizens are called upon to vote for the Bundestag.'

Based on the results of our experiment, we believe that a plural noun such as *Bürger* 'citizen' would preferably receive a neutral interpretation in this context and hence, would usually not be considered to carry a male bias.

Bußmann & Hellinger's (2003, p. 164) conclusion that "the referential range of personal masculines has become more narrow" is not confirmed by our analysis, and more importantly, it needs to be qualified in view of the variables that may have an influence on the speaker's interpretation: singular nouns in German are associated with a strong male bias, whereas plural

nouns tend to be interpreted as gender-neutral. Moreover, on the basis of Bußmann & Hellinger's claim, one would expect an overall predominance of non-neutral interpretations, which is not substantiated by our results.

The phenomenon that is discussed in this article, viz., the potential of masculine personal nouns to refer to males only or to both female and male persons, has been addressed in linguistics within the contexts of neutralisation (Coseriu, 1976, 1992 [1988]) and markedness (Jakobson, 1971 [1932], 1971 [1936]; Greenberg, 2005 [1966]; Waugh, 1982; Andersen, 2001, 2008).[17] In contemporary linguistics, both neutralisation and markedness have become broad semantic categories encompassing a wide variety of different phenomena (Haspelmath, 2006, De Backer, 2009). The basic observation that appears to underlie both notions, however, is that certain linguistic oppositions (including phonological, morphological, syntactic, and lexical oppositions) may be suppressed or blocked under specific circumstances. Thus, in German, there may be an opposition between *Arzt* and *Ärztin* as in (13). In (14), however, the opposition is cancelled, and it is the unmarked (viz., masculine) term that expresses the neutral meaning:

(13) *Ärztinnen und Ärzte bekommen Blumen von jenen Patienten, die sich inzwischen viel gesünder fühlen.* (Braunschweiger Zeitung, 14.02.2006)
'Female and male doctors receive flowers from those patients who are meanwhile feeling much healthier'.

(14) *Zum zweiten Mal innerhalb kurzer Zeit traten Ärzte in ganz Österreich in Streik.* (Niederösterreichische Nachrichten, 02.07.2008)
'For the second time in a short period, doctors in the whole of Austria came out on strike'.

Despite their widespread use, the notions of markedness and neutralisation remain controversial concepts in contemporary linguistics.

Haspelmath (2006) claims that the term markedness is, in fact, a superfluous term that is best replaced by other, less general and more straightforward terminological concepts. Haspelmath questions, in particular, the explanatory power of the notion of markedness. According to his reasoning, there are better explanations for those phenomena that have been explained in terms of markedness. One of these explanations is frequency.

[17] In neutralisation theory, the peculiar type of relationship between the members of a neutralisable pair (e.g., *day* vs. *night* or *masculine* vs. *feminine*) is also accounted for in terms of markedness. However, because the neutralisation and markedness theories differ in their descriptions of what is marked and unmarked in semantics, the concepts will be kept apart terminologically.

As an example, Haspelmath (2006) cites the frequencies observed by Leech et al. (2001) for adjective antonyms in English (e.g., *long* vs. *short*, *high* vs. *low*), which indicate that the unmarked term (e.g., *long*, *high*) is generally more frequent than its marked counterpart. These and other similar instances of "semantic markedness", which involve the type of relationship that we are investigating in this article, are best accounted for in terms of frequency differences according to Haspelmath.

Our multivariate analysis allowed us to expand the discussion of which variable best accounts for the observed differences in interpretation. By evaluating the role of various factors simultaneously, a more nuanced picture emerges. Our decision tree reveals that different factors are simultaneously involved in the interpretation of masculine personal nouns. Our model demonstrates, moreover, that relative frequency is indeed a contributing factor but that the effect of this factor is minor and not as straightforward as Haspelmath maintains.

3.2. Task 2

In this section, the results of the second task of the questionnaire are presented and discussed. The purpose of this part of the experiment was to evaluate participants' perceptions of the referential possibilities of the masculine personal nouns under investigation. Participants could assess the degree of possibility on a four-point Likert scale consisting of "certainly possible" (1), "possible, but unusual" (2), "hardly possible" (3), and "certainly not possible" (4). Sections 3.2.1, 3.2.2, and 3.2.3 are concerned with the answers to the additional questions relating to initial "male" (non-neutral) responses. Sections 3.2.4 and 3.2.5 address the answers to initial "male and/or female" (neutral) responses.

3.2.1. Initial "male" responses in the singular: is female reference also possible?

Table 5 shows that in the singular, there were more initial "male" responses in German (426/512, 83.2%) than in Dutch (343/512, 67%). This finding is in line with our hypothesis that German masculine nouns are more strongly correlated with a gender-specific interpretation, particularly in the singular. It can also be observed that in Dutch, there were relatively more positive responses (answer options 1, 2, and 3) to the question of whether it would also be possible to use the masculine noun in reference to a female person; in Dutch, 287 out of 343 initial "male" responses (or 84%) were re-evaluated as potentially having female reference compared to 287 out of 426

initial “male” responses (or 67%) in German. There was also a difference between German and Dutch regarding the participants’ assessments of the *degree* to which it was possible to use a singular masculine noun to refer to a female person; answer options (1) and (2) were selected relatively more frequently by the Dutch participants (24 and 39% in Dutch vs. 9 and 29% in German, respectively), whereas answer options (3) and (4) were chosen relatively more often by the German participants (29 and 33% in German vs. 21 and 16% in Dutch, respectively). In German, the mean answer to the question of whether it would be possible to use a singular masculine noun in reference to a female person was 3 (“hardly possible”), whereas the mean answer was 2 (“possible, but unusual”) in Dutch. The difference between German and Dutch reflects the higher degree of gender-neutrality (and hence, wider referential potential) of Dutch masculine personal nouns.

German	**1**	**2**	**3**	**4**	**Total**	**Dutch**	**1**	**2**	**3**	**4**	**Total**
Abonnent	6	9	5	1	**21**	**abonnee**		1			**1**
Apotheker	1	8	10	12	**31**	**apotheker**	8	4	4	1	**17**
Arzt	4	9	12	7	**32**	**arts**	4	1	1		**6**
Assistent	3	9	9	9	**30**	**assistent**	4	17	3	3	**27**
Begleiter	1	8	8	11	**28**	**begeleider**	10	9	7	5	**31**
Besucher		8	10	7	**25**	**bezoeker**	8	12	6	2	**28**
Bewohner	3	8	6	5	**22**	**bewoner**	6	6	4	2	**18**
Künstler	1	5	8	15	**29**	**kunstenaar**	5	14	8	5	**32**
Leser	3	5	4	2	**14**	**lezer**	2	5		1	**8**
Mieter	3	8	11	3	**25**	**huurder**	5	4	1	2	**12**
Musiker	3	11	9	8	**31**	**muzikant**	5	18	5	4	**32**
Politiker	1	10	10	7	**28**	**politicus**	7	14	3	4	**28**
Schauspieler	5	9	7	8	**29**	**acteur**	3	8	11	10	**32**
Schüler	2	8	4	16	**30**	**leerling**	8	7	1	3	**19**
Zuschauer	3	6	4	12	**25**	**toeschouwer**	7	8	6	3	**24**
Athlet	1	3	6	16	**26**	**atleet**	1	5	11	11	**28**
Total	**40**	**124**	**123**	**139**	**426**	**Total**	**83**	**133**	**71**	**56**	**343**

Table 5: Initial “male” responses in the singular: is female reference also possible?

A more detailed examination of Table 5 informs us that for some Dutch nouns, the total number of answers was particularly low, viz., *abonnee*, *arts*, *lezer*, and *huurder* (as well as *apotheker*, *bewoner*, and *leerling*). This observation indicates that for these nouns, the initial response was predominantly “male and/or female”. Moreover, the answers to the additional question mostly fall within the categories (1), (2), and (3), suggesting that reference to a female person is usually possible for this set of nouns. Interestingly, the total number of answers given to their German

equivalents was comparatively higher in most cases, particularly in the case of *Abonnent*, *Apotheker*, and *Arzt*. These findings might be associated with the fact that in Dutch, the formation of a feminine counterpart is not possible or of questionable acceptability for most of these nouns (cf., **abonnes*, **artse*, ?*huurster*, ?*apothekeres*, ?*leerlinge*). In German, by contrast, *Abonnentin*, *Ärztin*, *Mieterin*, *Apothekerin*, and *Schülerin* are perfectly normal from a morphological point of view. It might also be interesting to consider the relative frequency (cf., Table 4); the relative frequency of the aforementioned Dutch nouns is generally much higher than the relative frequency of their German counterparts, which can be associated with the observation that they are more often interpreted as gender-neutral terms in the first task and are more frequently considered to have a potential female reference. It was also found that in German, answer option (4) was selected most frequently with *Apotheker*, *Begleiter*, *Künstler*, *Schüler*, *Zuschauer*, and *Athlet*. In Dutch, the same applied to *acteur* and *atleet*. Note that almost all of these German and Dutch nouns had a low relative frequency (cf., Table 4). A final observation is that among the German and Dutch nouns that have the least number of total answers, most of them were non-occupational nouns, suggesting that the type of lexical unit might play a role in the interpretation of singular masculine nouns.

3.2.2. Initial "male" responses in the plural: is exclusively female reference also possible?

From Table 6, it can be observed that there were many missing values for both German and Dutch. Furthermore, the total number of answers was low in both languages. These observations imply that plural masculine nouns were most frequently interpreted as "male and/or female" in the first task. The lower number of total answers in German compared to Dutch was somewhat surprising. We would expect the opposite because of the assumed stronger association in German between grammatical and natural gender. In any case, both answer totals only constituted a small share of all responses given to plural masculines (17/512, or 3.3%, in German and 34/512, or 6.6%, in Dutch). The German participants considered the use of plural masculine nouns to refer to a group of only female persons to be possible, to some extent, in 13 out of 17 instances (or 76.5%). According to the Dutch participants, by contrast, this type of reference was possible in 28 out of 34 cases (or 82%). The answer options (1) and (2) were chosen most frequently by both language groups (23.5 and 41% in German vs. 38 and 26.5% in Dutch, respectively). However, for some participants, reference to only female persons by means of a plural masculine noun was

considered “hardly possible” (12% in German vs. 18% in Dutch) to “impossible” (23.5% in German vs. 18% in Dutch). In both German and Dutch, the mean answer to the question of whether it would be possible to use a plural masculine noun to refer to a group consisting of only female persons was 2 (“possible, but unusual”).

German	**1**	**2**	**3**	**4**	**Total**	**Dutch**	**1**	**2**	**3**	**4**	**Total**
Abonnent		1			**1**	**abonnee**	1				**1**
Apotheker	1		1	1	**3**	**apotheker**	5	3			**8**
Arzt	1	1			**2**	**arts**	1				**1**
Assistent		1		1	**2**	**assistent**				1	**1**
Begleiter						**begeleider**			1	1	**2**
Besucher						**bezoeker**					
Bewohner		1			**1**	**bewoner**		1	1		**2**
Künstler				1	**1**	**kunstenaar**	1	1			**2**
Leser		1			**1**	**lezer**		1			**1**
Mieter						**huurder**					
Musiker		1			**1**	**muzikant**	1	2			**3**
Politiker	1				**1**	**politicus**					
Schauspieler			1		**1**	**acteur**	2	1	2	2	**7**
Schüler						**leerling**					
Zuschauer						**toeschouwer**	1				**1**
Athlet	1	1		1	**3**	**atleet**	1		2	2	**5**
Total	**4**	**7**	**2**	**4**	**17**	**Total**	**13**	**9**	**6**	**6**	**34**

Table 6: Initial “male” responses in the plural: is exclusively female reference also possible?

A closer examination of Table 6 reveals that for the following plural nouns, the initial response was always “male and/or female”: *Begleiter*, *Besucher*, *Mieter*, *Schüler*, and *Zuschauer* in German and *bewoner*, *huurder*, *politicus*, and *leerling* in Dutch. For the following nouns, only one participant marked the answer option “male” in the first task: *Abonnent*, *Bewohner*, *Leser*, *Künstler*, *Musiker*, *Politiker*, and *Schauspieler* in German and *abonnee*, *assistent*, *arts*, *lezer*, and *toeschouwer* in Dutch. These lists of nouns suggest that initial “male and/or female” responses are more strongly associated with non-occupational nouns than with occupational nouns. It can also be observed that answer option (4) was chosen only for *Apotheker*, *Assistent*, *Künstler*, and *Athlet* in German and *assistent*, *begeleider*, *acteur*, and *atleet* in Dutch. Interestingly, all of these nouns had a low relative frequency (cf., Table 4). Most initial “male” responses were found with *Apotheker* and *Athlet* in German and *apotheker*, *acteur*, and *atleet* in Dutch, i.e., occupational nouns with a low relative frequency.

3.2.3. Initial "male" responses in the plural: is reference to a mixed group also possible?

Regarding the question of whether it would be possible to use a plural masculine noun in reference to a group consisting of both male and female persons, Table 7 indicates that this usage was judged to be always clearly possible by both the German and Dutch participants. Other general observations were the same as those described previously (Table 6). The mean answer to this question was 1 ("certainly possible") for both German and Dutch.

German	**1**	**2**	**3**	**4**	**Total**	**Dutch**	**1**	**2**	**3**	**4**	**Total**
Abonnent	1				**1**	**abonnee**	1				**1**
Apotheker	3				**3**	**apotheker**	8				**8**
Arzt	2				**2**	**arts**	1				**1**
Assistent	2				**2**	**assistent**	1				**1**
Begleiter						**begeleider**	2				**2**
Besucher						**bezoeker**					
Bewohner	1				**1**	**bewoner**	2				**2**
Künstler	1				**1**	**kunstenaar**	2				**2**
Leser	1				**1**	**lezer**	1				**1**
Mieter						**huurder**					
Musiker	1				**1**	**muzikant**	3				**3**
Politiker	1				**1**	**politicus**					
Schauspieler	1				**1**	**acteur**	7				**7**
Schüler						**leerling**					
Zuschauer						**toeschouwer**	1				**1**
Athlet	3				**3**	**atleet**	5				**5**
Total	**17**				**17**	**Total**	**34**				**34**

Table 7: Initial "male" responses in the plural: is reference to a mixed group also possible?

3.2.4. Initial "male and/or female" responses in the singular: a preferential interpretation?

Table 8 demonstrates that initial "male and/or female" responses were higher in Dutch than in German (169/512, or 33%, in Dutch vs. 86/512, or 17%, in German). As we expected, there was never a preference for a singular masculine noun to refer to a female person. The total number of answers indicating that there is no preference for either of the natural genders was much higher in Dutch than in German: 101 out of 169 instances, or 60%, in Dutch vs. 19 out 86 instances, or 22%, in German. This finding confirmed our hypothesis that Dutch personal nouns are more strongly associated with a neutral interpretation than their German equivalents. By contrast, the total number of answers reflecting a preference for a male referent was lower in Dutch than in

German: 68 out of 169 instances, or 40%, in Dutch vs. 67 out of 86 instances, or 78%, in German.

German	np	m	Total	Dutch	np	m	Total
Abonnent	3	8	11	**abonnee**	30	1	**31**
Apotheker		1	1	**apotheker**	4	11	**15**
Arzt				**arts**	19	7	**26**
Assistent		2	2	**assistant**	2	3	**5**
Begleiter	1	3	4	**begeleider**		1	**1**
Besucher	3	4	7	**bezoeker**	2	2	**4**
Bewohner	1	9	10	**bewoner**	8	6	**14**
Künstler		3	3	**kunstenaar**			
Leser	5	13	18	**lezer**	12	12	**24**
Mieter	2	5	7	**huurder**	12	8	**20**
Musiker	1		1	**muzikant**			
Politiker		4	4	**politicus**	1	3	**4**
Schauspieler	1	2	3	**acteur**			
Schüler	1	1	2	**leerling**	5	8	**13**
Zuschauer		7	7	**toeschouwer**	5	3	**8**
Athlet	1	5	6	**atleet**	1	3	**4**
Total	**19**	**67**	**86**	**Total**	**101**	**68**	**169**

Table 8: Preferential interpretation with respect to initial singular “neutral” responsesExamining Table 8 in more detail, some singular nouns in both German and Dutch were initially never interpreted as neutral: *Arzt* in German and *kunstenaar*, *muzikant,* and *acteur* in Dutch. The following singular nouns were very infrequently interpreted as neutral: *Apotheker*, *Assistent*, *Begleiter*, *Künstler*, *Musiker*, *Politiker*, *Schauspieler*, and *Schüler* in German and *assistent*, *begeleider*, *bezoeker*, *politicus*, and *atleet* in Dutch. An interesting observation is that most of the nouns cited in these lists had a low relative frequency (cf., Table 4). A comparison of the noun pairs *Abonnent*/*abonnee*, *Apotheker*/*apotheker*, *Arzt*/*arts*, *Mieter*/*huurder*, and *Schüler*/*leerling* reveals that the Dutch nouns were much more frequently interpreted as neutral in the first task than their German equivalents. As previously mentioned, such differences might be explained by the lower degree of productivity of Dutch derivational suffixes. Table 8 also illustrates that the following singular nouns were relatively often interpreted as neutral in the first task: *Leser*, *Abonnent*, and *Bewohner* in German and *abonnee*, *apotheker*, *arts*, *bewoner*, *lezer*, *huurder*, and *leerling* in Dutch. Also here, a neutral interpretation appeared to be associated with non-occupational nouns.

3.2.5. Initial "male and/or female" responses in the plural: a preferential interpretation?

Finally, Table 9 indicates that with respect to plural masculine nouns, there were many "male and/or female" responses (495/512, or 97%, in German vs. 478/512, or 93%, in Dutch). As in Table 6, the observed higher frequency of initial neutral interpretations in German was somewhat unexpected, but the answer totals of the German and Dutch participants did not differ that much. In both German and Dutch, the predominant answer to the question of whether participants prefer either of the natural genders was "no preference" (401/495, or 81%, in German vs. 330/478, or 69%, in Dutch).

German	**np**	**m**	**Total**	**Dutch**	**np**	**m**	**Total**
Abonnent	30	1	**31**	**Abonnee**	30	1	**31**
Apotheker	17	12	**29**	**apotheker**	9	15	**24**
Arzt	24	6	**30**	**arts**	22	9	**31**
Assistent	20	10	**30**	**assistent**	21	10	**31**
Begleiter	25	7	**32**	**begeleider**	16	14	**30**
Besucher	31	1	**32**	**bezoeker**	27	5	**32**
Bewohner	31		**31**	**bewoner**	28	2	**30**
Künstler	24	7	**31**	**kunstenaar**	15	15	**30**
Leser	30	1	**31**	**lezer**	22	9	**31**
Mieter	30	2	**32**	**huurder**	28	4	**32**
Musiker	18	13	**31**	**muzikant**	18	11	**29**
Politiker	19	12	**31**	**politicus**	18	14	**32**
Schauspieler	23	8	**31**	**acteur**	11	14	**25**
Schüler	31	1	**32**	**leerling**	30	2	**32**
Zuschauer	31	1	**32**	**toeschouwer**	24	7	**31**
Athlet	17	12	**29**	**atleet**	11	16	**27**
Total	**401**	**94**	**495**	**Total**	**330**	**148**	**478**

Table 9: Preferential interpretation with respect to initial plural "neutral" responses

Table 9 also illustrates that no plural nouns were never initially interpreted as neutral. In German, there were no nouns for which the answer "preferentially male" was selected more frequently in the second task than the answer "no preference". In Dutch, a higher number of "preferentially male" responses was only observed with *apotheker*, *acteur*, and *atleet*. Exhibiting a very high number of "no preference" responses were the following nouns: *Abonnent*, *Besucher*, *Bewohner*, *Leser*, *Mieter*, *Schüler*, and *Zuschauer* in German and *abonnee*, *bezoeker*, *bewoner*, *huurder*, and *leerling* in Dutch. Note that all of these nouns belong to the class of non-occupational nouns. Conversely, a more pronounced preference for plural masculine nouns to refer to only male persons was found with *Apotheker*, *Musiker*, *Politiker*, and *Athlet* in German and *apotheker*,

begeleider, *kunstenaar*, *politicus*, *acteur*, and *atleet* in Dutch. Almost all of these last-named German and Dutch nouns are of the occupational type (excluding *begeleider*).

The general conclusion that can be drawn from the results of the second task is that the German masculine personal nouns are more restrictive in terms of potential reference than their Dutch counterparts. This finding confirmed our hypotheses that Dutch masculine personal nouns are more frequently interpreted as gender-neutral terms and are characterised by a higher degree of gender-neutrality than German personal masculines. The data also indicate, however, that some nuance is in order. In particular, the observation that the possibility to include female reference is more limited in German than in Dutch is much more pronounced in the singular than in the plural. Thus, the difference in referential potential between German and Dutch masculine personal nouns is clear in the singular, with German nouns receiving higher mean answer values (in case the initial answer was "male") and fewer "no preference" responses (in case the initial answer was "male and/or female"). In the plural, however, the German and Dutch nouns appear to have similar referential possibilities (note also that those participants who assigned a neutral interpretation in the first task selected slightly more often the answer option "no preference" in the second task in German than in Dutch).

4. Conclusions

The purpose of this article was twofold. On the one hand, we aimed to investigate by means of a questionnaire study how German and Dutch native speakers interpret masculine personal nouns used in referential contexts and determine which variables have an influence on the interpretation. On the other hand, we wanted to examine how the German and Dutch participants evaluate the referential possibilities of the investigated masculine personal nouns. On the basis of the first task of the questionnaire, we found evidence for our hypothesis that masculine personal nouns are more frequently interpreted as gender-specific terms in German than in Dutch. We additionally found that the interpretation of the German and Dutch nouns is significantly associated with the following variables: number, lexical unit type, and relative frequency. Number was the best predictor variable in both German and Dutch, with singular nouns preferably interpreted as non-neutral and plural nouns preferably as neutral. In German, the next best predictor of interpretation was lexical unit type for both singular and plural nouns, whereas in Dutch, lexical unit type only contributed significantly for plural nouns. Relative frequency was

also a relevant factor in both German and Dutch but only at a lower level. The variables definiteness and gender of the subjects did not appear to play a role in the interpretation in either German or Dutch. The results of the second task of the questionnaire were in line with the findings obtained in the first task: Dutch masculine personal nouns were more frequently re-evaluated as potentially having female reference and received better possibility ratings than their German counterparts.

In our view, our statistical analysis of a large number of experimental data constitutes an important methodological improvement of previous research. In particular, our study offers a more nuanced picture of the generic potential and actual interpretation of masculine personal nouns by demonstrating that their interpretation as either neutral or non-neutral is associated with (the interaction between) multiple variables. Regarding the German part of the experiment, our data indicate that, contrary to what is claimed in the literature (e.g., Bußmann & Hellinger, 2003 or Braun et al, 2005), plural personal masculines are likely to be interpreted gender-neutrally, even more so if they are of the non-occupational type and/or have a high relative frequency. Moreover, contra Massner (2010), we found no evidence that women are more sensitive to the gender distinctions. Regarding the Dutch part of the experiment, our study provides empirical evidence in support of the tendency reported by Gerritsen (2002, pp. 102-105) and Lutjeharms (2004, p. 204) that masculine personal nouns are frequently interpreted as gender-neutral terms. As a general conclusion, we can state on the basis of our survey experiments that there is a difference between the interpretation of German and Dutch personal masculines, with German nouns carrying a stronger male bias, but that this difference particularly pertains to singular nouns, not plural nouns.

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