

An experimental investigation of the denotation of German masculine nouns

Cornelia Ebert (University of Frankfurt), Stefan Hinterwimmer (University of Wuppertal),
Robin Hörnig (University of Tübingen) & Anna Pia Jordan-Bertinelli (University of
Wuppertal)

In languages such as German and French, nouns are obligatorily marked for grammatical gender (*masculine, feminine* or *neuter*). There clearly is no 1:1 correspondence between grammatical gender and (the absence of) biological sex since nouns naming inanimate objects such as *Tisch* (table) are marked for masculine grammatical gender, for instance. Regarding nouns denoting (sets of) humans, however, it is a hotly debated topic whether nouns in the masculine form (which is, in most cases, morphologically unmarked, with the female form being derived via the suffix *-in*) denote (sets of) male as well as female or non-binary persons having the relevant property or whether they denote (sets of) male persons exclusively (see, e.g., Diewald 2018 and Trutkowki & Weiß 2023 for opposing views). On the one hand, there is clear empirical evidence (see, e.g., Gygax 2008 and the overview in Nübling & Kotthoff 2018) that the masculine form is strongly associated with male humans and is in many cases used to refer to (sets of) male humans exclusively. On the other hand, there is also evidence that some nouns in the masculine form can be used to refer to pluralities consisting of male, female and non-binary individuals: The sentence in (1a), for instance, is clearly understood as specifying the number of all inhabitants of Paris, not just the male ones. The sentence in (1b), in contrast, can easily be understood as specifying the number of male professors exclusively. Moreover, even if it is clear that the speaker intends to refer to all professors, using the masculine form is seen as inappropriate by many speakers.

- (1) a. Paris hat 2.161 Millionen Einwohner. b. An unserer Universität gibt es 253 Professoren.
Paris has 2.161 million inhabitants. At our university, there are 253 professors.

One option to capture this pattern is to assume that nouns in the unmarked masculine form indeed simply denote sets of human individuals having the respective property, but that in many cases the more specific reading on which they denote only the male ones is triggered via a conversational implicature (Becker 2008). On this view, the relation between, e.g., *Mechaniker* (mechanic) and *Mechanikerin* (female mechanic) is the same as the relation between, e.g., *rectangle* and *square*: Since every square is by definition a rectangle, it is in principle always possible to refer to a square as a rectangle. In a context in which squares have already been mentioned explicitly, however, or in a context in which it is relevant whether a rectangle is a square or not, using the noun *rectangle* to refer to an object triggers the conversational implicature that it is not a square. This is due to the fact that the addressee assumes the speaker to follow the maxim of relevance (Grice 1989): Since the more specific noun *square* is available and since it is relevant whether the object they intend to refer to is a square, the speaker is assumed to use the noun *rectangle* because that object is a rectangle, but not a square. Similarly, in a context in which female or non-binary members of the relevant group have already been mentioned explicitly or where it is relevant whether the individual/group of individuals that the speaker intends to refer to is female or non-binary/contains female or non-binary individuals, the speaker is assumed to use the masculine form only if the individual/group of individuals they intend to refer to consists of male individuals exclusively.

Consequently, in (1a), where the biological sex/gender identity of the inhabitants is not relevant since it is clear that individuals of all biological sexes/gender identities live in Paris, the noun

Einwohner is understood as referring to all inhabitants of Paris, irrespective of biological sex/gender identity. In (1b), in contrast, mentioning the biological sex/gender identity of the members of the group that the speaker intends to refer to is relevant because of the existence of sexist stereotypes of professors being male, as well as the real gender employment gap between male and female professors in German universities. Not using an inclusive form that explicitly encompasses female individuals therefore either triggers the implicature that the speaker intends to refer to male professors exclusively or that they do not care about potential misunderstandings due to the existence of sexist stereotypes.

We ran two experiments within an acceptability rating study (5 = completely acceptable; 1 = completely unacceptable) with 20 participants in which the test items of one experiment served as fillers for the other experiment and vice versa. We tested the hypothesis just outlined, i.e. that the interpretation of masculine forms comprising only male individuals is due to a conversational implicature. In Experiment 1, we tested the hypothesis that, being an implicature, it should be possible to cancel, in a second sentence, the exclusively male interpretation of a masculine noun introducing a referent in a first sentence, as in (2a). In contrast, no such cancellation should be possible subsequent to a feminine noun introducing a referent, leading to a stronger decrease in acceptability for the incongruent version in (2b) compared to the congruent version in (2a). A similar difference was expected between the congruent (3a) and the incongruent (3b) hyponym-hyperonym pairs in (3).

- (2) a. Die älteste Uhr der Welt gehört einem Mechaniker. Genauer gesagt ist es eine Mechanikerin.
The world's oldest clock belongs to a mechanic. To be more precise, it is a female mechanic.
b. Die älteste Uhr der Welt gehört einer Mechanikerin. Genauer gesagt ist es ein Mechaniker.
The world's oldest clock belongs to a female mechanic. To be more precise, it is a mechanic.
- (3) a. In der Mitte des neuen Stadtplans befindet sich ein Rechteck. Genauer gesagt ist es ein Quadrat.
In the middle of the new map, there is a rectangle. To be more precise, it is a square.
b. In der Mitte des neuen Stadtplans befindet sich ein Quadrat. Genauer gesagt ist es ein Rechteck.
In the middle of the new map, there is a square. To be more precise, it is a rectangle.

The twelve test items consisted of 4 items each with a stereotypically male profession (cf. (2)), a stereotypically female one and a neutral one (based on the classification in Gabriel et al. 2008); 12 baseline items involved inanimate objects in hyponym-hyperonym pairs figured as the fourth level of the factor Stereotype. The second factor varied whether the item involved a congruent (2/3a) or incongruent (2/3b) noun pair, which were assigned to two lists according to a Latin Square design. Congruent items like (2a) and (3a) were predicted to be judged alike, i.e. they should be judged as mildly deviant due to the cancellation of an implicature. Incongruent items like (2b) and (3b), in contrast, were predicted to receive significantly lower ratings. These predictions were only partially confirmed (see Table 1): Congruent items were consistently judged significantly more acceptable than incongruent items, yet congruent test items were judged as less acceptable than congruent baseline items. There was no effect of stereotype on the test items.

In Experiment 2 we tested the hypothesis that explicitly mentioning women in the immediately preceding context should trigger the implicature that the variant marked for masculine gender refers to male individuals exclusively. Participants read test items such as (4a-b), where in one

variant, the relevant context, women were explicitly mentioned in the opening sentence, while in the other variant, the irrelevant context, the opening sentence was just a general statement.

- (4) a-b. [Mittlerweile gibt es auch einige Frauen, die im technischen Sektor arbeiten (A)]|[Die Arbeit im handwerklich-technischen Sektor erfährt endlich eine gesellschaftliche Aufwertung (B).] Das ist auch gut so, denn besonders im Bereich Automechanik werden dringend Fachkräfte gebraucht. Inzwischen ist beinahe ein Viertel der Mechaniker, die in Kfz-Werkstätten angestellt sind, weiblich.
By now, there are quite a few women who work in the technical sector. (A)/Work in the technical sector is finally more appreciated by society (B). That is a good thing since especially in the area of car mechanics, skilled workers are urgently needed. By now, almost a quarter of the mechanics working in car workshops are female.

The final sentences were predicted to receive lower ratings in the relevant than in the irrelevant context variants: In the relevant contexts, the implicature is triggered that the noun marked for masculine grammatical gender is interpreted as referring to male individuals exclusively, which leads to a contradiction. In the irrelevant contexts, in contrast, that implicature is not automatically triggered. The predictions of Experiment 2 were confirmed: Test items were judged significantly less acceptable in the A variant than in the B variant (mean = 3.58, se = .196; mean = 4.16, se = .177). While the results of Experiment 2 are compatible with the analysis outlined above, the results of Experiment 1 raise the question of whether the implicature that nouns in the masculine form denote (sets of) male individuals exclusively is on the verge of becoming grammaticalized. In order to test this option, we are currently running replications of Experiments 1 and 2 in which speakers of different age groups are tested.

Table 1. Experiment 1: Mean Acceptability ratings (standard errors of mean in parentheses) for the three stereotype plus baseline condition, separately for congruent and incongruent noun pairs

	<i>Male Stereotype</i>	<i>Female Stereotype</i>	<i>Neutral Stereotype</i>	<i>Baseline: Hypo-/ Hyperonym</i>
<i>Congruent</i>	2.44 (1.14)	2.24 (1.12)	2.38 (1.01)	4.24 (0.62)
<i>Incongruent</i>	1.71 (1.06)	1.85 (1.03)	1.88 (1.13)	2.14 (0.97)

References

- Becker, Thomas (2008). Zum generischen Maskulinum: Bedeutung und Gebrauch der nichtmolekularen Personenbezeichnungen im Deutschen. *Linguistische Berichte* 213, 65-75.
- Diewald, Gabriele (2018). Zur Diskussion: Geschlechtergerechte Sprache als Thema der germanistischen Linguistik – exemplarisch exerziert am Streit um das sogenannte generische Maskulinum. *Zeitschrift für Germanistische Linguistik* 46.2, 283–299.
- Gabriel et al. (2008): Au pairs are rarely male: Norms on the gender perception of role names across English, French, and German. *Behavior Research Methods* 40(1), 206-212.
- Grice, Paul (1989). *Studies in the Way of Words*. Cambridge (Mass.), London: Harvard University Press.
- Gygax, Pascalet al. (2008). Generically intended, but specifically interpreted: when beauticians, musicians, and mechanics are all men. *Language, Cognition and Neuroscience* 23.3, 464–485.
- Nübling, Damaris & Helga Kotthoff (2018). *Genderlinguistik. Eine Einführung in Sprache, Gespräch und Geschlecht*. Tübingen: Narr Francke Attempto.

Trutkowski, Ewa & Helmut Weiß (2023). Zeugen gesucht! Zur Geschichte des generischen Maskulinums im Deutschen. *Linguistische Berichte* 273, 5-40.