

# A discriminative account of masculine generics and their masculine bias in German

Dominic Schmitz<sup>1</sup>, Viktoria Schneider<sup>2</sup> & Janina Esser<sup>3</sup>

<sup>1</sup> Heinrich Heine University Düsseldorf, dominic.schmitz@uni-duesseldorf.de, <sup>2</sup> Heinrich Heine University Düsseldorf, <sup>3</sup> div-ling – Association for Diversity in Linguistics

**Keywords:** discriminative learning, error-driven, gender bias, genericity

Traditionally, masculine generics in German have been assumed to be sex- or gender-neutral (Doleschal 2002). As an example, consider the grammatically masculine role noun *Chemiker* 'chemist'. Despite its grammatical gender, it is not only used to refer to male but to refer to female chemists as well, even though there is an explicitly feminine counterpart, *Chemikerin*. Regardless of the generically intended usage of masculine generics, though, research of the last two decades has demonstrated that masculine generics apparently are not neutral but biased towards a masculine reading (e.g. Gygax et al., 2008; Irmen & Kurovskaja, 2010; Misersky et al., 2019). That is, while *Chemiker* might be intended as generic, its masculine bias leads to predominantly male associations. However, which semantic features of masculine generics lead to this masculine bias is unclear.

The present study aims at filling this knowledge gap using an approach novel to this kind of research: discriminative learning. As a usage-based, error-driven approach, it follows a discriminative perspective on language, arguing that the relation between form and meaning is fundamentally discriminative (cf. Rescorla & Wagner, 1972; Wagner & Rescorla, 1972). Therefore, a word's semantics emerges by the word's resonance with the entire lexicon. In turn, then, the masculine bias of masculine generics should result from the resonance of masculine generics and all other entries of the lexicon.

Using linear discriminative learning as a specific framework of discriminative learning (Baayen et al. 2019), measures describing the semantics resulting from this resonance with the lexicon were computed. The simulated lexicon was based on 830,000 sentences from German news websites and consisted of 30,887 lexicon entries with 7,511 semantic dimensions. The extracted semantic measures gave insight into the comprehension quality, the semantic neighbourhood density, and the level of semantic coactivation of target words. Target words were 113 of those used in Gabriel et al. (2008). Making use of these words allowed us to use the stereotypicality judgements elicited in the aforementioned study to control for potential influences of world-knowledge which are not captured by our approach.

The extracted measures and stereotypicality judgements were then used in a multinomial logistic regression to predict masculine generic and masculine and feminine explicit forms of the 113 target words. The model found no significant effect of stereotypicality. The semantic measures, however, all reached significance. Overall, masculine and feminine forms are significantly different in their semantic features. For instance, masculine forms, i.e. generics and explicit forms, come with significantly higher comprehension quality and denser semantic neighbourhoods. Using Bayes Factors (Wagenmakers 2007), we confirmed that there is no difference in terms of underlying measures between masculine generics and explicit forms.

Our analysis of the underlying semantic features of masculine generics and masculine and feminine explicit forms demonstrates that the masculine bias of masculine generics is due to their specific resonance with other entries of the lexicon. Hence, even though masculine generics might be intended as semantically generic, their interrelation with the lexicon results in overall masculine biased associations.

## References

- Baayen, R. Harald, Yu-Ying Chuang, Elnaz Shafaei-Bajestan & James P. Blevins. 2019. The discriminative lexicon: A unified computational model for the lexicon and lexical processing in comprehension and production grounded not in (de)composition but in linear discriminative learning. *Complexity* 2019. 4895891. <https://doi.org/10.1155/2019/4895891>.
- Doleschal, Ursula. 2002. Das generische Maskulinum im Deutschen. Ein historischer Spaziergang durch die deutsche Grammatikschreibung von der Renaissance bis zur Postmoderne. *Linguistik Online* 11(2). <https://doi.org/10.13092/lo.11.915>.
- Gabriel, Ute, Pascal Gygax, Oriane Sarrasin, Alan Garnham & Jane Oakhill. 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. <https://doi.org/10.3758/BRM.40.1.206>.

- Gygax, Pascal, Ute Gabriel, Oriane Sarrasin, Jane Oakhill & Alan Garnham. 2008. Generically intended, but specifically interpreted: When beauticians, musicians, and mechanics are all men. *Language and Cognitive Processes* 23(3). 464–485.  
<https://doi.org/10.1080/01690960701702035>.
- Irmen, Lisa & Julia Kurovskaja. 2010. On the semantic content of grammatical gender and its impact on the representation of human referents. *Experimental Psychology* 57(5). 367–375.  
<https://doi.org/10.1027/1618-3169/a000044>.
- Misersky, Julia, Asifa Majid & Tineke M. Snijders. 2019. Grammatical gender in German influences how role-nouns are interpreted: Evidence from ERPs. *Discourse Processes* 56(8). 643–654.  
<https://doi.org/10.1080/0163853X.2018.1541382>.
- Rescorla, Robert A. & Allan R. Wagner. 1972. A theory of Pavlovian conditioning: Variations in the effectiveness of reinforcement and nonreinforcement. In A. H. Black & W. F. Prokasy (eds.), *Classical conditioning II: Current research and theory*, 64–99. Appleton-Century-Crofts.
- Wagenmakers, Eric Jan. 2007. A practical solution to the pervasive problems of p values. *Psychonomic Bulletin and Review*. Psychonomic Society Inc. 14(5). 779–804.  
<https://doi.org/10.3758/BF03194105>.
- Wagner, Allan R. & Robert A. Rescorla. 1972. Inhibition in Pavlovian conditioning: Application of a theory. In R. A. Boakes & M. S. Halliday (eds.), *Inhibition and learning*, 301–334. Academic Press Inc.