



# In German, all professors are male

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# The generic masculine in German

*Professor*  
'professor'



*Professorin*  
'professor'



**SINGULAR**

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**PLURAL**

*Professoren*  
'professors'



*Professorinnen*  
'professors'



# The generic masculine in German

Professor  
'professor'



Professor  
'professor'

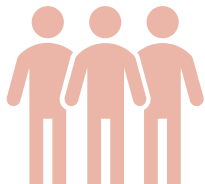


Professorin  
'professor'

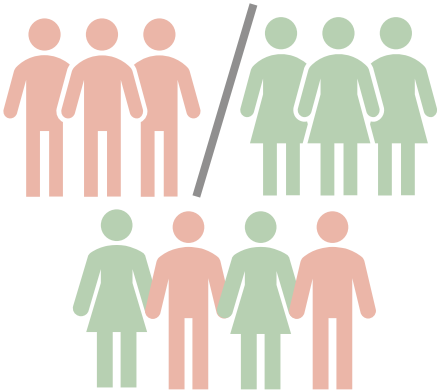


masculine generics abstract away notions of gender  
—  
they are gender-neutral

Professoren  
'professors'



Professoren  
'professors'



Professorinnen  
'professors'

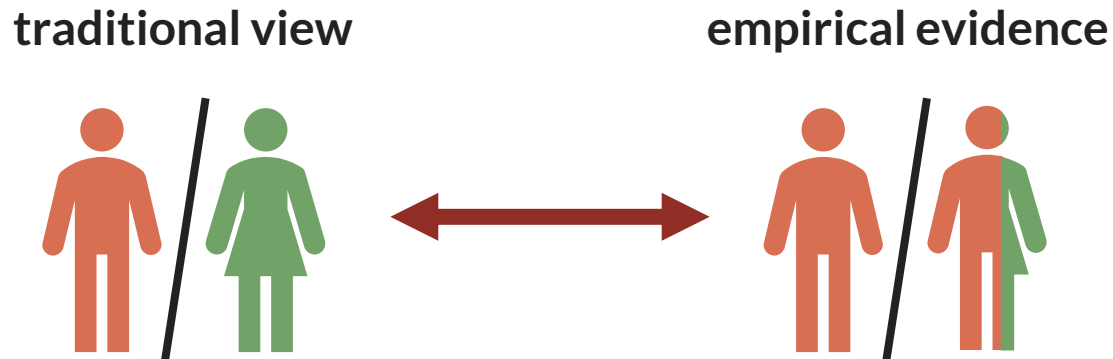


cf. Doleschal (2002)

# Previous research: Findings

- previous behavioural research has cast doubt on the gender-neutrality of masculine generics
- most (if not all) studies find a clear bias towards the explicit masculine

**reading** (e.g. Demarmels, 2017; Garnham et al., 2012; Gygax et al., 2008; Irmen & Kurovskaja, 2010; Irmen & Linner, 2005; Koch, 2021; Misersky et al., 2019; Stahlberg & Sczesny, 2001; Trutkowski, 2018)



- generic intention and actual comprehension differ

# Previous research: Issues

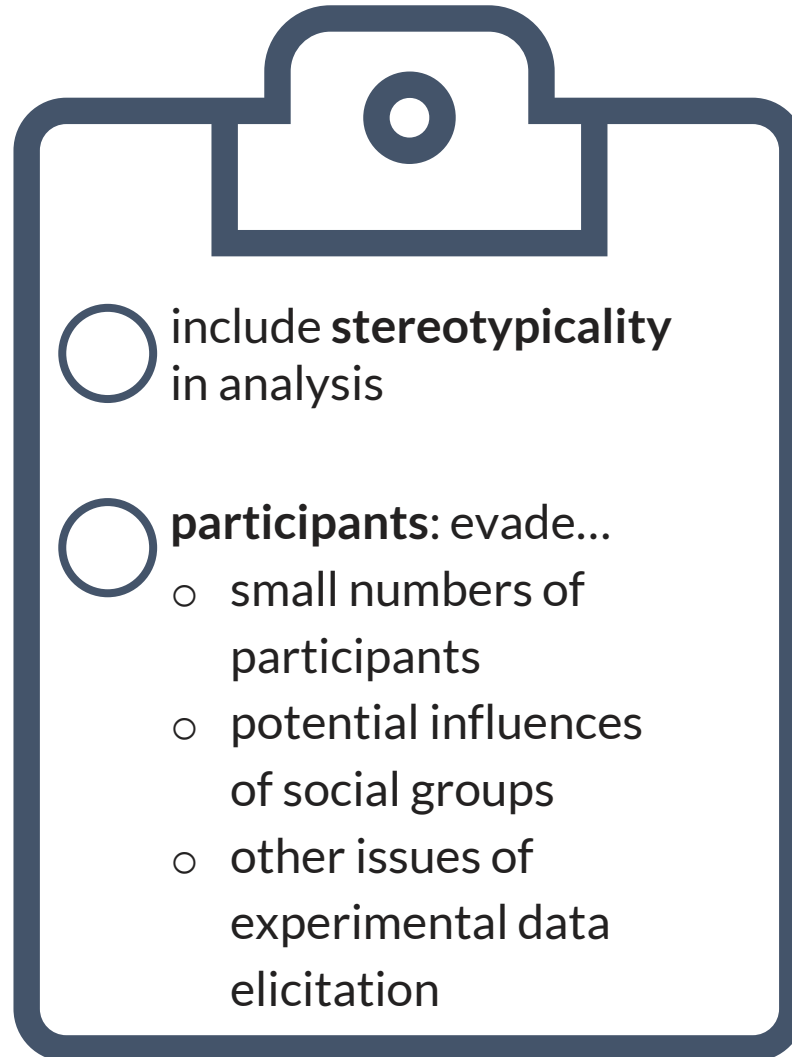
## **Issue 1: Stereotypicality**

Almost no previous research included potential effects of stereotypicality in their analyses on masculine generics.

## **Issue 2: Participants**

Most studies' results rely on small numbers of participants, most of which were students.

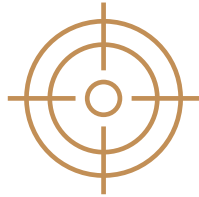
# To-do list



include **stereotypicality** in analysis

- participants: evade...**
- small numbers of participants
  - potential influences of social groups
  - other issues of experimental data elicitation

# Method



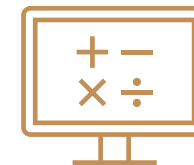
target words with available  
stereotypicality ratings <sup>1</sup>



text corpus containing  
target + further words <sup>2</sup>



annotation of bases, inflectional  
functions, genericity <sup>3</sup>



computation of semantic vectors  
via Naive Discriminative Learning <sup>4</sup>

<sup>1</sup> Gabriel et al. (2008); <sup>2</sup> Goldhahn et al. (2012); <sup>3</sup> Schmid (1999); <sup>4</sup> Baayen & Ramscar (2015)

# Method

Professor  
'professor'



$$\mathbf{=} \overrightarrow{\text{Professor}} + \overrightarrow{\text{SINGULAR}} + \overrightarrow{\text{MASCULINE}} + \overrightarrow{\text{EXPLICIT}}$$

Professor  
'professor'



$$\mathbf{=} \overrightarrow{\text{Professor}} + \overrightarrow{\text{SINGULAR}} + \overrightarrow{\text{MASCULINE}} + \overrightarrow{\text{GENERIC}}$$

Professorin  
'professor'



$$\mathbf{=} \overrightarrow{\text{Professor}} + \overrightarrow{\text{SINGULAR}} + \overrightarrow{\text{FEMININE}} + \overrightarrow{\text{EXPLICIT}}$$

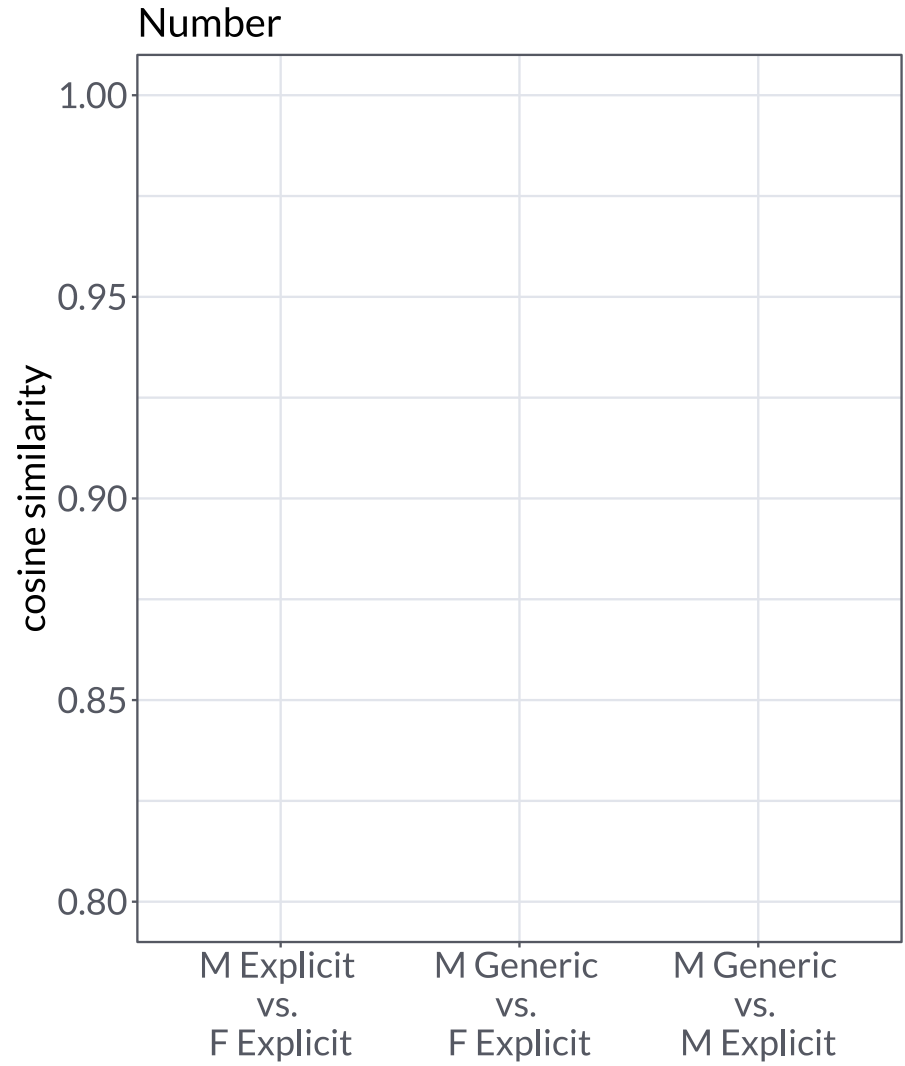
cf. Baayen et al. (2019)



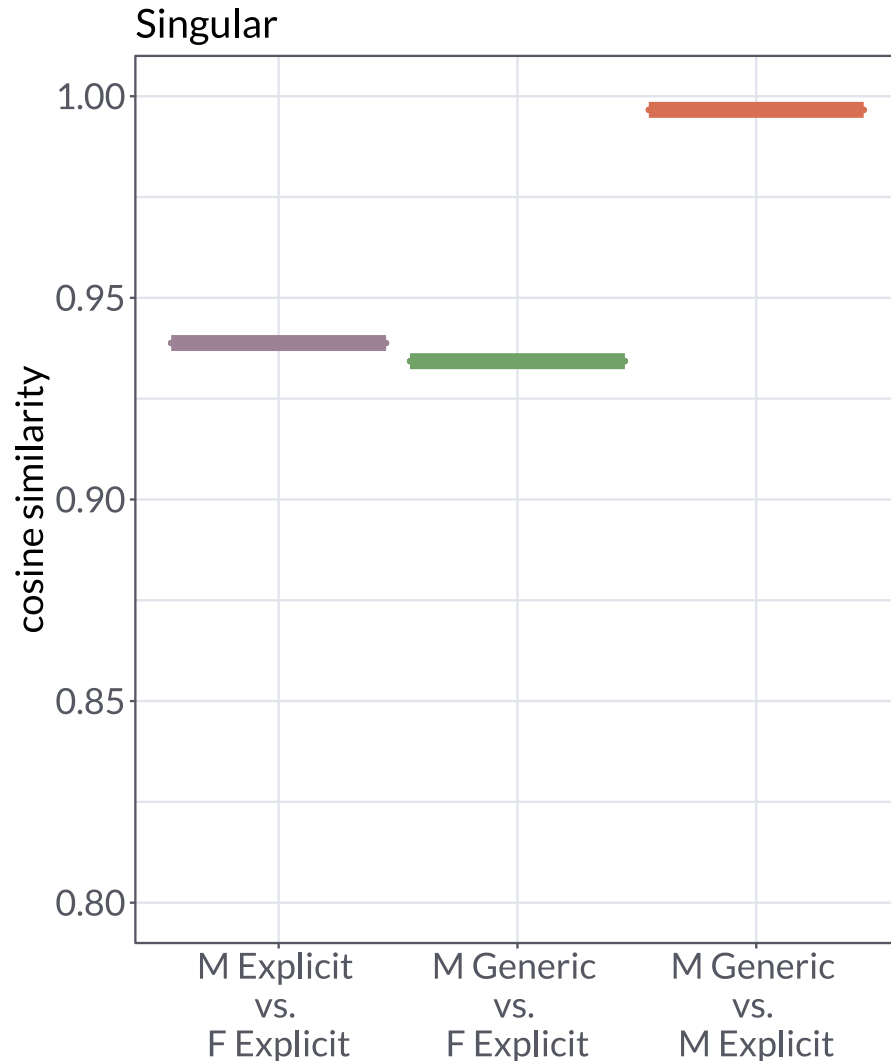
# Analysis

- the resulting vectors of masculine generics & masculine and feminine explicit were then compared via cosine similarity
- cosine similarity
  - measure to describe the similarity of vectors
  - takes values in the interval of  $[0,1]$
  - higher values indicate a higher similarity
  - lower values indicate a lower similarity
- in the present case:  
similarity of vectors reflects similarity of two words' semantics

# Analysis: Bias

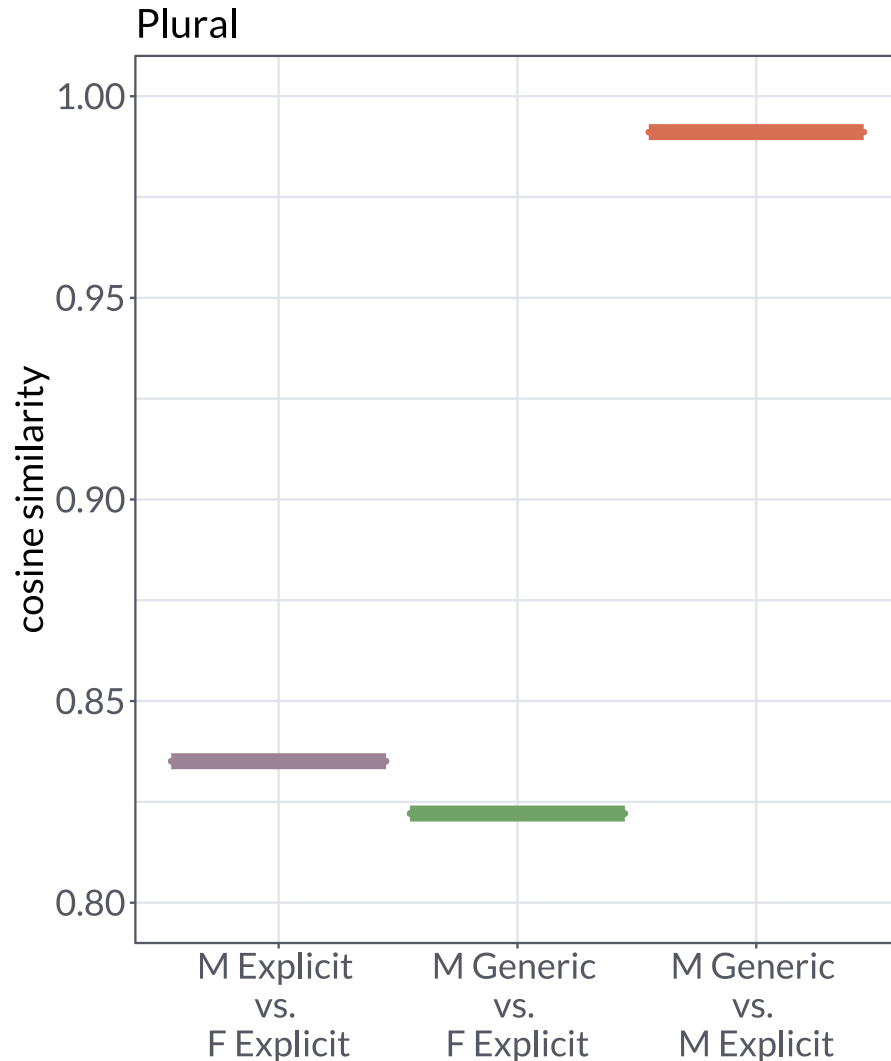


# Analysis: Bias



- **masculine generics** and the **explicit masculine** are semantically most similar
- the **explicit feminine** is more similar to the **explicit masculine** than to **masculine generics**
- all comparisons are highly significant

# Analysis: Bias



- **masculine generics** and the **explicit masculine** are semantically most similar
- the **explicit feminine** is more similar to the **explicit masculine** than to **masculine generics**
- all comparisons are highly significant
- differences are more pronounced

# Analysis: Stereotypes

- check whether stereotypicality significantly influences the bias
- beta regression models

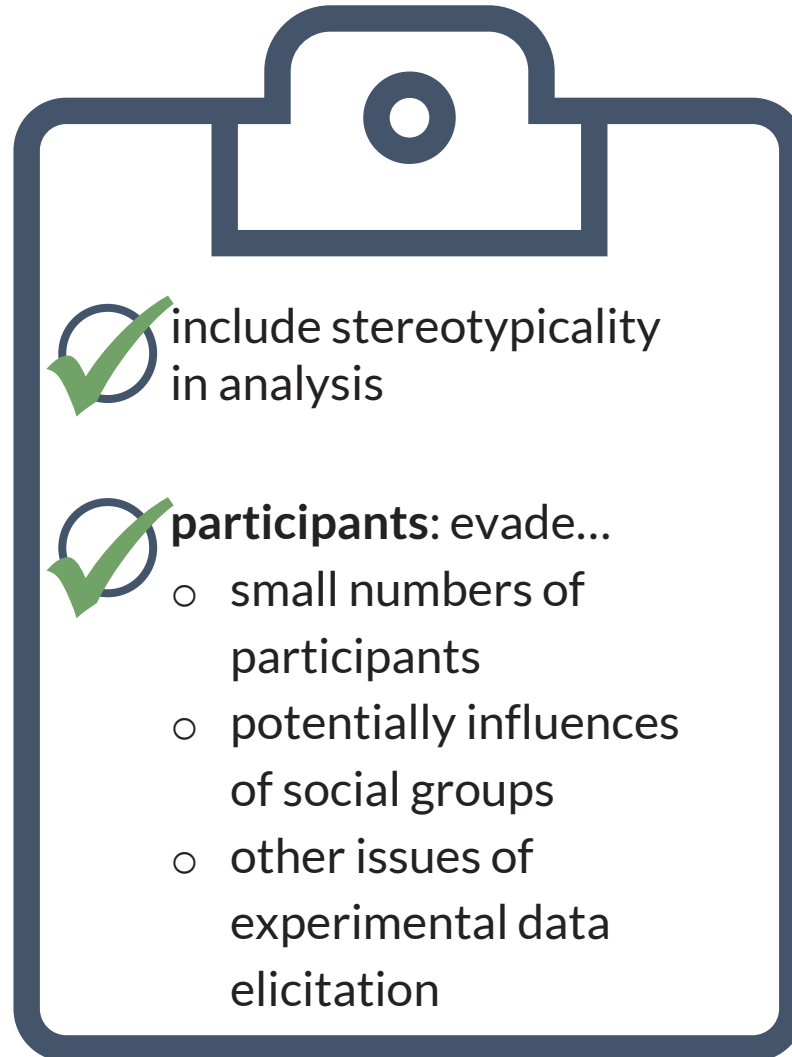
*cosine similarity values ~ stereotypicality ratings*

- if stereotypicality ratings **show a significant effect**, the bias is **modulated by stereotypicality**
- if stereotypicality ratings **show no significant effect**, the bias is **not modulated by stereotypicality**

# Analysis: Stereotypes

	cosine similarities of...	effect of stereotypicality?
singular	masculine generic & masculine explicit	
	masculine generic & feminine explicit	
	masculine explicit & feminine explicit	
plural	masculine generic & masculine explicit	
	masculine generic & feminine explicit	
	masculine explicit & feminine explicit	

# To-do list



# Discussion

- masculine generics and the explicit masculine are semantically most similar
- the explicit feminine is more similar to the explicit masculine than to masculine generics
- masculine generics show a clear bias towards the masculine reading, producing a ‘male bias’ in the language system itself
- the present findings confirm the bias found in previous behavioural studies (e.g. Demarmels, 2017; Garnham et al., 2012; Gygax et al., 2008; Irmen & Kurovskaja, 2010; Irmen & Linner, 2005; Koch, 2021; Misersky et al., 2019; Stahlberg & Sczesny, 2001; Trutkowski, 2018)
- future research – and indeed already on-going research<sup>1</sup> – will shed light on the underlying semantic features of the masculine generic and the explicit forms, providing further insight into the nature of the ‘male bias’

<sup>1</sup>cf. Schmitz et al. (2022)



# Thank you!



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