Simon David Stein and Viktoria Schneider

Effects of English generic singular *they* on the gender processing of L1 German speakers

Abstract: In both German and English, generic masculine pronouns, such as *his*, are often used to include people of all genders (e.g., *On his first day at school, a pupil is usually very nervous*). However, previous studies found that generic masculine forms have a clear male bias. English, as opposed to German, features an increasingly commonly used, supposedly gender-neutral alternative to generic masculine pronouns: singular *they* (e.g., *On their first day at school, a pupil is usually very nervous*). Given that there is no straightforward German alternative, how do German learners of English interpret English singular *they*? Are they aware of its supposed gender-neutrality? We conducted an experiment asking L1 German participants to write a short story about a pupil and provide the pupil's name (cf. Moulton et al. 1978). Each participant received one of two versions of the task, one group starting the story following a sentence with a generically used *his* and the other following a sentence with a generically used *their*. We find a significant (albeit weak) effect, consistent with previous findings, showing that the stimulus version with *they* leads to fewer male protagonists. German learners of English do indeed seem to perceive English singular *they* as more gender-neutral than generic *his*. The results have implications for English language learning of L1 German speakers, and more generally for gender bias in language.

Keywords: English, gender-neutral language, generic masculine, German, L2 transfer, male bias, pronoun interpretation, singular they

1 Introduction

In both German and English, generic masculine pronouns, such as *seinem* 'his' in (1) and *his* in (2), are often used to include people of all genders.

(1) *An seinem ersten Schultag ist ein Schüler für gewöhnlich sehr nervös.*

Simon David Stein, Department of English Language and Linguistics, Heinrich Heine University Düsseldorf, e-mail: simon.stein@uni-duesseldorf.de
Viktoria Schneider, Department of English Language and Linguistics, Heinrich Heine University Düsseldorf, e-mail: viktoria.schneider@uni-duesseldorf.de

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(2) *On his first day at school, a pupil is usually very nervous.*

However, previous studies found that generic masculine forms, both pronouns and role nouns, have a clear male bias (e.g., Martyna 1978; Rothmund and Scheele 2004; Braun et al. 2005; Gabriel et al. 2008; Gygax et al. 2008, 2009; Miller and James 2009; McConnell-Ginet 2015; Schmitz et al. 2023; Schmitz 2024). English, as opposed to German, features an increasingly commonly used, supposedly gender-neutral alternative to generic masculine pronouns: singular *they* (Conrod 2020). This is exemplified with the possessive pronoun *their* in (3).

(3) *On their first day at school, a pupil is usually very nervous.*

But how do German learners of English interpret English singular *they*? Gender biases in the L1 are often observed to be transferred to L2 (Cook 2018; Koster and Loerts 2020; Schoenmakers et al. 2022), but there is no straightforward one-to-one mapping of singular *they* onto a German neutral alternative.[1] Are German speakers aware of the supposed gender-neutrality of singular *they* in English?

Previous research on L1 to L2 transfer of gender found that the interpretation of the gender of a referent is highly dependent on the gender assignment in the L1 (e.g., Cook 2018; Sabourin et al. 2016; Koster and Loerts 2020; Schoenmakers et al. 2022; Sato et al. 2013). For example, Sabourin et al. (2016) found that native speakers of English perform worse in gender assignment in German and Romance languages, which have grammatical gender class systems, than native speakers which are already used to a grammatical class system. For L1 German L2 English speakers, one could hypothesize a transfer of the grammatical gender of generic masculine forms in German to English generics. Broadly speaking, in German, the male form of a role noun (e.g., *Arbeiter* 'worker') or of a pronoun (e.g., *seinem* 'his') can be used to refer to people regardless of referent gender (e.g., Gabriel et al. 2008; Gygax et al. 2008, 2009; Schmitz et al. 2023). In English, this is true for pronouns as well: It is possible to use the masculine pronoun *his* for generic reference (e.g., Baron 1981; Conrod 2020; Hekanaho 2020), as illustrated above in (2). This means that a form with a one-to-one mapping is available (*seinem* → *his*). This generic masculine form is commonly used in German, and English features a direct equivalent.

However, English has had a gender-neutral alternative to the generic masculine for several decades: generic singular *they* (Conrod 2020). Recent studies showed that singular *they* can be interpreted in different ways but can indeed also be interpreted

1 There is a plural interpretation of *they* mapping onto German third-person plural *sie*. While we do not test for plural interpretation in the present study, and the stimulus sentence is unambiguously singular, we consider it an interesting avenue for future studies to investigate to what extent plurality affects gender interpretation.

as gender-neutral (Conrod 2020). Additionally, a computational study using a cognitively grounded learning algorithm indicates that singular *they* is semantically close to other gender-neutral forms, like, for example, *everyone, no one, anyone* (Schmitz, in this book). It is currently unclear to what extent German speakers are aware of this gender-neutral option.

In order to test the gender processing of singular *they* by L1 German speakers, we conducted an online experiment. In the experiment, German participants were asked to write a short story about a pupil and provide the pupil's name (cf. Moulton et al. 1978). Each participant received one of two versions of the writing task, one group starting the story following a sentence with a generically used *his* as in (2) and the other following a sentence with a generically used *their* as in (3). We expected the stimulus version with the generic masculine pronoun *his* to lead to more male pupils as protagonists and to allow for less variation of protagonist genders than generic *their*.

2 Transfer effects of gender biases

2.1 Language transfer

Some studies on the transfer of grammatical features from L1 to L2 have shown that their structure in the L1 influences their use in the L2 (e.g., Cook 2018; Sabourin et al. 2016; Koster and Loerts 2020; Schoenmakers et al. 2022; Sato et al. 2013). In other words, these studies found effects of language transfer from the L1 into the patterns of the L2.

Of particular interest for the present study is the L1 to L2 transfer of gender bias. It has been shown that, for example, L1 speakers of Russian (a language with grammatical gender) can have difficulties processing English gendered pronouns incongruent with the grammatical gender of the corresponding nouns in Russian (Cook 2018). However, this effect was only found for animate nouns, not for inanimate ones. Koster and Loerts (2020) showed that learners of German and Dutch as L2s (respectively) have difficulties with the assignment of gender classes for nouns due to differences in grammatical gender assignment in the two languages. One main finding of a study by Sabourin et al. (2016) was that L1 English speakers perform worse than native speakers in gender assignment in German and in Romance languages, which have grammatical gender class systems.

Sato et al. (2013) found that stereotypicality influence how English L1 speakers assign gender in L2 French. French learners of L2 English transfer a male-dominant bias based on the French gender system. Furthermore, the effect weakens with a

higher proficiency in the L2. French, like German, has a male bias in its gender system. If an effect on gender assignment in L2 English is found for French L1 speakers, it is reasonable to suspect that a similar effect could arise with German L1 speakers.

As we can see, existing research suggests that transfer of gender bias between languages is, in general, possible. Despite this, it is an open question in how far a male bias in the German gender system could be specifically transferred to the interpretation of English generic singular *they*, a pronoun for which, as established above, no direct equivalent is available in German. To illustrate this in more detail, let us take a look at the gender assignment systems of German and English and their generic masculine forms.

2.2 The generic masculine

Before looking at the generic masculine, let us start with a brief overview of gender assignment in general. Grammatical gender is used for noun classes (Hockett 1958). The number of gender classes for nouns is language-dependent (Siemund 2008). The gender assignment of one noun is, in turn, reflected in, for example, articles, adjectives, pronouns, etc. (Corbett 1991). In order to assign a gender class to a noun, different systems are used. For example, the distinction between male and female gender can be related to the referent gender or referent sex (Corbett 1991). Further notional distinctions are, among others, animate and inanimate, human and non-human, and large and small. Gender assignment, as well as which system this assignment uses as basis, is language-dependent. Some languages use perceived real-world distinctions, others use morphological and phonological information, and other languages might use a mixture of both patterns or categorize nouns into gender classes in yet other ways (Corbett 2007). Thus, gender assignment in a language can rely on semantic criteria, syntactic criteria or a mixture of both. In a language that uses semantic criteria, a noun is categorized by a semantic feature, for example, gender, animacy, or humanity. In a syntactic gender assignment system, in contrast, morphological, phonological, and syntactic features determine the gender of a noun, often ignoring the actual gender of a referent (Corbett 2007).

In English, gender is generally semantically assigned, whereas in German, gender is generally morphosyntactically assigned. More precisely, English words like *man*, *woman*, and *hat* receive their gender class via semantic criteria. That is, a man is male, receives the male gender class, and is referred to by the pronoun *he*. A woman is female, receives the female gender class, and is referred to by the pronoun *she*. A hat is an object and is therefore assigned a neuter gender class and referred to by the pronoun *it* (Siemund 2008). In German, on the other hand, gender is (mostly) assigned by morphosyntactic features, and different morphosyntactic items (e.g.,

adjectives) have to agree. For example, the word *Lehrer* 'teacher' is masculine in German. If the referent is male, the referent gender and the gender class agree, as in Example (4).

However, the form *Lehrer* can also refer to teachers in general, no matter whether referents are male or of other genders, as in (5). As this is a generic usage, this particular masculine form is called "generic masculine". Importantly, this form is not only generic, but also gender-neutral, supposedly including referents of all genders (Doleschal 2002; Diewald 2018; Nübling and Kotthoff 2018).

(4) *Der Lehrer steht vor seiner Klasse.*
'The (male) teacher is standing in front of his class.'

(5) *Ein Lehrer sollte immer nett sein.*
'A teacher should always be nice.'

A second, famously cited, example where referent gender does not correlate with grammatical gender is the German word *Mädchen* 'girl'. The suffix *-chen* is a diminutive in German and always triggers the gender class neuter, irrespective of the fact that the referent gender is female (Corbett 1991: 227f.).

For pronouns, a similar male bias is observed in German. The examples in (6) and (7) show that masculine forms of pronouns (*seinem*, *seiner*) are used to refer to referents of any gender.

(6) *An seinem ersten Schultag ist ein Schüler für gewöhnlich sehr nervös.*
'On his first day at school, a pupil is usually very nervous.'

(7) *Ein Lehrer sollte immer nett zu seiner Klasse sein.*
'A teacher should always be nice to his class.'

Given these two different ways of gender assignment, the question arises how gender interpretation and potential gender biases manifest across systems. We know that generic masculine forms are often not interpreted as truly gender-neutral (e.g., Martyna 1978; Rothmund and Scheele 2004; Braun et al. 2005; Gabriel et al. 2008; Gygax et al. 2008, 2009; Miller and James 2009; McConnell-Ginet 2015; Schmitz et al. 2023; Schmitz 2024). It is reasonable to expect that the interpretation of English generic masculine forms (like generic *his*) by L1 German speakers is subject to the same male bias as German generic masculine forms (like generic *seinem*), or even that this bias in English will be enhanced by the corresponding bias in German in an effect of transfer. In other words, the bias in German may be directly carried over to English. However, it is less clear how L1 German speakers would interpret a supposedly more gender-neutral alternative like generic singular *their*, for which no direct equivalent exists in German. On the one hand, given the highly binarily gen-

dered nature of German's morphosyntactically governed gender system, and given the lack of a German equivalent to generic singular *their*, it is possible to expect L1–L2 transfer effects which inhibit gender-neutral interpretations of singular *their* for L1 German speakers. In other words, L1 German speakers could show a male bias not only for generic *his* but also for generic *their*, because they associated generic forms with the masculine and are not aware of the intended gender-neutrality of *their* (e.g., Conrod 2020). On the other hand, it is possible to expect that *their* will be interpreted at least as more gender-neutral than generic *his*. This is because due to potential transfer effects, the interpretation of *his* will be strongly affected by the (male) interpretation of *seinem*, while the interpretation of *they* will not. We arrive at the following hypotheses:

H1: German learners of English will show a male bias for generic *his*.
H2: German learners of English will also show a male bias for generic *their*.
H3: The male bias for generic *their* will be weaker than for generic *his*.

As we can see, interestingly, both the expectation that *they* will feature a male bias for L1 German speakers and the opposite expectation that it will not feature a bias, or at least not feature as strong a bias as *his*, can be justified by transfer effects. Note that the design of the study does not hinge on which expectation we follow: We simply investigate whether L1 Germans speakers interpret the English generic pronoun *their* as more gender-neutral than the English generic masculine pronoun *his*.

3 Method

We conducted a type of experiment that we refer to as the *short story approach*. The short story approach is a tried and tested, highly controlled, and thoroughly disguised approach for eliciting gender bias in language and was pioneered as early as the seventies by Moulton et al. (1978). In a nutshell, this approach requires participants to write a short story following a stimulus sentence that contains a specific pronoun. The gender that participants choose for their protagonist then serves as a proxy to gauge the influence of this pronoun on participants' gender associations.

The online questionnaire was created using SoSci Survey and designed as follows. First, in order to conceal the true purpose of the study, participants were told that the aim of the study was to test how German as a first language affects creative writing in English. Participants were informed that they can only participate if they are adults with German as L1 who have learned English, that the collected data remain anonymous, that they can quit the study at any time without giving reasons

and without any negative consequences. They then gave their informed consent to participate.

The participants received written instructions for the short story task in German. The task asked them to write a short story (about 10 sentences), fitting a specific theme, about a fictional character. The instructions emphasized that the character had to be fictional and that participants were not allowed to write about themselves. The theme was a stimulus sentence that either included the generic masculine pronoun *his* and read *On his first day at school, a pupil is usually very nervous*, or included generic singular *their* and thus read *On their first day at school, a pupil is usually very nervous*. The role noun *pupil* was chosen for two reasons. First, it is one of the rare role nouns that can be assumed to have an approximately equal distribution of male and female referents in most German- and English-speaking countries.[2] We thus hold constant potential gender associations based on real-world distributions or based on stereotypes connected to specific role nouns. Second, we opted for *pupil* because this word does not morphophonologically resemble typical German gendered role nouns, opposed to, for instance, *student*, which resembles the German word *Student* 'student' but also specifically 'male student'. We thus hold constant potential cross-linguistic gender biases introduced by word form.

Following an empty text field where participants typed their story, we asked participants to give their fictional character a name or, if they had already done so in the story itself, to re-type the name. This ensured that, together with the pronouns participants use in their stories, we have sufficient information to infer the intended gender of their protagonists. This question also re-emphasized that participants were not to write about themselves. The question was followed by a demographic section where we asked for participants' age, gender, additional L1s, additional L2s, onset of English acquisition, and time spent abroad in English-speaking countries. Finally, we asked what participants believed was the true purpose of the study. This was crucial because we were interested only in subconscious gender associations, rather than conscious decisions in the choice of protagonist gender that would potentially be subject to a social desirability bias.

We distributed the questionnaire online and randomly assigned participants either the stimulus with the generic masculine pronoun *his* or the stimulus with generic singular *their*. Including only questionnaires where participants reached the final page, our dataset comprised 53 L1 German speakers in total. Of these, we excluded four whose response to our question about the purpose of the study included any suspicion related to gender or pronouns. We excluded an additional participant

2 See, e.g., data by the Federal Statistical Office of Germany: https://www.destatis.de/DE/Presse/Pressemitteilungen/2024/03/PD24_101_211.html, accessed: 07 February 2025.

who did not answer the questions properly and was likely a bot, another one who did not provide a character name and informed us they had not understood the prompt, and another one whose protagonist gender could neither be reliably categorized based on the pronouns in their story nor based on the character name provided ("Maths"). The cleaned dataset comprised 46 participants (39 female, 7 male; age 18–60 with $\bar{x}$ = 27.49 and s_x = 8.94; with the onset of English learning at $\bar{x}$ = 8.37, s_x = 2.44 years), of which 27 drew the stimulus with the pronoun *his* and 19 drew the stimulus with the pronoun *their*.

We analyzed the data statistically, using binomial logistic regression in R (R Core Team 2023).[3] This choice of model was motivated by the type of response variable (a categorical binary outcome PROTAGONIST GENDER with the protagonist being `male` or `female`) and the fact that we wanted to simultaneously control for important covariates.

Let us briefly look at the variables used for the analysis. Our response variable is PROTAGONIST GENDER. After cleaning the data as described above, the coding for this variable turned out to be unambiguous for the remaining participants, as all remaining participants provided both character names and consistent female or male pronouns in their story. PROTAGONIST GENDER can thus take the values `male` or `female` in our dataset.[4] Our predictor of interest is PRONOUN USED IN STIMULUS, either `his` or `their`. As explained above, we expect the generic masculine pronoun *his* to show a male bias in protagonist genders, while generic singular *their* could also show a bias, but potentially a weaker one.

Moving on to the covariates, we include AGE OF PARTICIPANT. It is possible to expect a general male bias in protagonist gender to be weaker for younger participants due to an increased awareness of questions of representation. Next, we control for GENDER OF PARTICIPANT, which in our sample takes the values `female` or `male`. We can expect male participants to more frequently write about male protagonists than female participants, and female participants to more frequently write about female protagonists than male participants. This is due to a bias known as the "self-imagery hypothesis", which is the assumption that people tend to interpret generics to agree with their own gender (MacKay and Fulkerson 1979: 671). Finally, we have three covariates gauging different kinds of language proficiency. PARTICIPANT HAS ADDITIONAL L1, with either `yes` or `no`, specifies whether the participant has any L1s in addition to German. We pooled this variable rather than allowing one category for each individual L1, which, due to our diverse participants, could have caused overfitting

3 The interested reader can view the data, including the short stories, and the scripts with all full models in the supplementary materials at https://osf.io/hbm3n, accessed: 16 July 2023.

4 Note that none of the participants in this sample chose to give their protagonist another gender than male or female.

Tab. 1: Overview of variables used in the analysis of gender bias in the interpretation of generic *his* and generic singular *their*.

Variable name	Description
Response variable	
PROTAGONIST GENDER	Gender of the short story's protagonist
Predictor variables	
PRONOUN USED IN STIMULUS	Specifies whether participants saw a generic masculine *his* or generic singular *their*
AGE OF PARTICIPANT	The age of the participant in years
GENDER OF PARTICIPANT	The gender of the participant
PARTICIPANT HAS ADDITIONAL L1	Specifies whether the participant has another L1 (other than German)
ONSET OF ENGLISH ACQUISITION	The age at which the participant had started learning English in years
TIME IN ENGLISH-SPEAKING COUNTRIES	The total duration of a participant having lived in an English-speaking country in months

issues in the model. ONSET OF ENGLISH ACQUISITION specifies the age at which participants started learning English. TIME IN ENGLISH-SPEAKING COUNTRIES specifies the time in months that participants had spent abroad in one or more English-speaking countries. For these variables, we can expect that the more proficient participants are in terms of additional L1s or in terms of English, the more familiar they will be with gender-neutral pronouns cross-linguistically, or specifically with the intended gender-neutrality of singular *they* in English. This could further reduce the overall male bias in protagonist genders. Table 1 provides a summary of the variables included in the model.

4 Results

We first performed a reality check on the data from the generic masculine stimulus to see whether it produces the male bias known from the literature. Figure 1 plots the distribution of protagonist genders following the stimulus sentence with *his*. We can see that following this supposedly generic masculine pronoun, we find significantly more male protagonists than female protagonists ($\chi^2 = 10.704$, $df = 1$, $p = 0.001$), replicating the known bias from English L1 speakers for our participant sample.

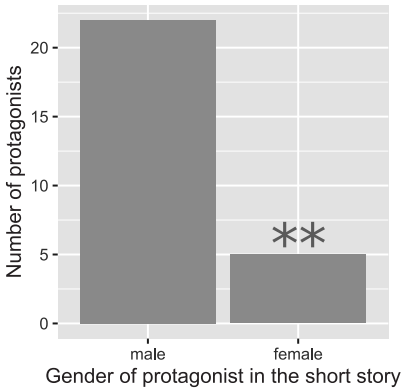

Fig. 1: Distribution of protagonist genders following the stimulus with generic *his*.

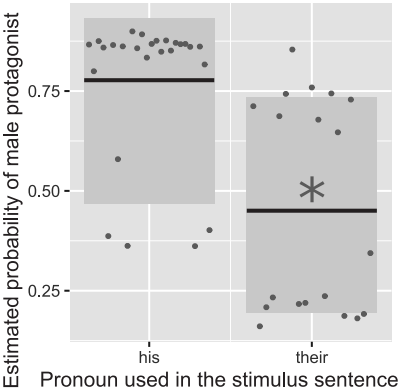

Fig. 2: Effect of generically used pronoun *his* or *their* on the probability of male protagonists.

Tab. 2: Binomial logistic regression model reporting effects on the probability of male PROTAGONIST GENDER.

	Estimate	SE	z	$P_{\|z\|}$
Intercept	2.7171	1.7737	1.53	0.1256
PRONOUN USED IN STIMULUS `their`	-1.4484	0.7256	-2.00	0.0459
AGE OF PARTICIPANT	-0.0610	0.0470	-1.30	0.1936
GENDER OF PARTICIPANT `male`	0.3394	1.0077	0.34	0.7362
PARTICIPANT HAS ADDITIONAL L1 `yes`	0.0697	0.9517	0.07	0.9417
ONSET OF ENGLISH ACQUISITION	0.0064	0.1650	0.04	0.9688
TIME IN ENGLISH-SPEAKING COUNTRIES	0.0530	0.0538	0.99	0.3244

We then modeled all data, including both generic *his* and generic *their*, using binomial logistic regression as described in Section 3. Table 2 reports the effects of all variables on the probability of a protagonist having male gender (rather than female gender). We can see that none of the covariates yields a significant effect, perhaps due to the relatively small sample size and thus, for some of the variables, relatively low amount of data points per category. All the more strikingly, we do find a significant negative effect of PRONOUN on PROTAGONIST GENDER. When the stimulus sentence features generic singular *their* instead of generic masculine *his*, the probability of the protagonist's gender being male is significantly lowered. Note that the p-value of .0459 is close to the conventional threshold for significance of .05. While

this threshold is arbitrary, we think that conservatively-phrased conclusions are always well-advised. Moving away from p-values and quantifying the evidence from a Bayesian perspective, we could, for example, say that we do find evidence for our hypothesis, but only "weak" evidence. We use the Bayes Factor approximated by the difference in BIC values between our model in Table 2 and the same model without PRONOUN (Wagenmakers 2007). We find that the data is more likely under H_1 than under H_0 ($BF_{01} = .79$). Assuming that it is a priori equally plausible that PRONOUN affects and does not affect PROTAGONIST GENDER, the posterior probability of H_1 ($Pr_{H_1}|D = .55$) is then labeled "weak" evidence, according to the Raftery (1995) classification scheme. We think that attempts at replication and falsification of this effect in the near future would be welcome to substantiate its stability.

To visualize the result, Figure 2 plots the effect of PRONOUN on the probability of male protagonists. The lower bar for *their* shows that the stimulus version with this pronoun leads to significantly fewer male protagonists than the stimulus version with the pronoun *his*. Following the stimulus sentence with *his*, we can see that the model estimates the probability of a protagonist being male at above 75 %, while following the stimulus sentence with *their*, this probability is estimated to be slightly below 50 %. In an ideal world, this nearly equal probability of female and male protagonists, plus a demographically reasonable probability of other gender identities, is what we would expect from a truly gender-neutral pronoun. In our non-ideal world, the data still offer two takeaways: First, that similarly to L1 English speakers, generic masculine *his* is not truly gender-neutral for L1 German speakers either, and second, that for these speakers generic *their* does a better job at being neutral than does generic *his*.

5 Discussion

We have investigated the following hypotheses about how L1 German speakers interpret English generic singular *their* with regard to gender neutrality:
H1: German learners of English will show a male bias for generic *his*.
H2: German learners of English will also show a male bias for generic *their*.
H3: The male bias for generic *their* will be weaker than for generic *his*.

Compared to generic masculine *his*, for which we were able to replicate the male bias found in previous research (H1), the results have shown that L1 German speakers interpret generic singular *they* as more neutral (H3). These results are encouraging in the context of English language learning of L1 German speakers, but they also have implications for gender bias in language more generally.

Let us first discuss our reality check (H1), i.e., the successful replication of the male bias associated with the generic masculine (in this case, the pronoun *his*). This finding is in line with other studies that found masculine generics (pronouns or role nouns) to be associated with male referents rather than referents of other genders (e.g., Martyna 1978; Rothmund and Scheele 2004; Braun et al. 2005; Gabriel et al. 2008; Gygax et al. 2008, 2009; Miller and James 2009; McConnell-Ginet 2015; Schmitz et al. 2023; Schmitz 2024). The fact that we find crosslinguistic support for this finding with L1 German speakers may hint at an L1–L2 gender bias transfer. Of course, it is hard to disentangle how much of this male bias results from the participants' knowledge of English, a language in which this bias exists, and how much of it results from their transferred knowledge of German, a language in which this bias also exists. For L1 German speakers, the bias in the latter may strengthen the bias in the former, but this remains an open empirical question. In this study, we did not find an effect of English proficiency on the probability of PROTAGONIST GENDER (as operationalized by ONSET OF ENGLISH ACQUISITION and TIME SPENT IN ENGLISH-SPEAKING COUNTRIES), which could have been indicative of the direction of this interplay between the two languages and their biases. Even so, future studies should attempt to test more systematically for proficiency effects. These studies could also try to replicate the effects with L1 English speakers as a control group.

One argument that is often raised against studies claiming to have found masculine generics to be male-biased is that this bias may not be associated with language, but with language-external factors. It may be the case that the masculine interpretation of English generics results from an across-the-board male bias in the thinking of language users that does not necessarily involve accessing linguistic knowledge. This is what Silveira (1980) calls a general "people = male" bias. Henley (1989: 72) adds that this might be an instance of a larger thought bias pattern, "the generic = specific" bias. Rothmund and Scheele (2004) suggest that this stereotypical view is a heuristic strategy. If no context information is available and gender-specific hints are lacking, people are likely to associate males because "the typical representative of the category HUMAN has the characteristic MALE" (Rothmund and Scheele 2004: 50, our translation). While the people = male bias may exist for our participants, the setup of our study allowed us to show that it alone cannot account for the associations of our participants, but that language must play a role here. This is because we directly compared the generic masculine pronoun that showed the male bias (*his*) to another pronoun that did not (*their*). Given that this pronoun was the only difference between the stimuli, we can confidently state that at least part of the male bias we found is directly related to language, rather than merely to a general bias unaffected by linguistic stimuli.

Moving on from the reality check and turning to the answer to our research question (H2 and H3), interestingly, the male bias decreases with the use of a gender-

neutral pronoun *their* in English (i.e., we find support for H3). This suggests that generic *their* can truly be interpreted more neutral by L1 German speakers, similar to L1 English speakers. If this is correct, this would be good news for singular *they* as a candidate for reducing gender bias that even works crosslinguistically.

In terms of transfer effects, we discussed the possibility (see Section 2.1) that transfer can affect the strength of the bias of generic singular *their* compared to generic masculine *his* in both directions. On the one hand, L1 German speakers may associate generics in general with the masculine and, consequently, with male referents, making even generic singular *they* vulnerable to bias. On the other hand, due to the direct mapping of *seinem* to *his*, but the lack of a German equivalent for generic singular *they*, *his* may be biased more strongly than *their* for L1 German speakers. The latter assumption would be able to better explain at least partly the difference in gender-neutrality we found between *his* and *their*.

We can think of one additional explanation for this finding to consider, which is, similar to the case of *his* discussed above, the proficiency of the participants in our experiment (cf. Sato et al. 2013). A higher proficiency in the L2 weakens the effect of a transfer from a participant's L1 language. As explained above, in our case, since German features a male bias in the interpretation of its generic forms, L1 German speakers could be expected to feature a bias not only in the English generic masculine, but also for generic *their*. However, when these speakers are highly proficient in English, this bias could be blocked, as these speakers are more familiar with the intended neutrality of *their*. While we did not find an effect of the variation of English proficiency in our data, it may be that the overall level of proficiency of our participants was high enough to lead to a more gender-neutral interpretation of *their*.

On a general methodological note, despite the relative small sample size, we were able to find a significant effect of PRONOUN USED IN STIMULUS ON PROTAGONIST GENDER. To investigate the stability of that effect, we hope that the present study can serve as a template for future studies. The short story approach can make it challenging to recruit a large number of participants since people are tasked to produce a piece of creative writing, requiring more effort than other types of questionnaire (e.g., the average multiple choice survey), which we speculate may have led to a lower return rate. However, we think that the short story approach is also a very elegant and underused paradigm. It offers a high degree of experimental control and a thorough disguise of the study's purpose, while still being able to access subconscious gender associations. In short, it is as implicit as one can get without using real-time methods (reaction times, brain imaging, etc.). In addition, the rich creative writing data we collected can be re-used for other types of study, for instance, in second-language learning contexts or literary and cultural studies.

6 Conclusion

With this study we have provided a template[5] to test for crosslinguistic biases in the gender interpretation of generics, reviving a time-tested, implicit but easy-to-implement method of eliciting gender bias (cf. Moulton et al. 1978). Using a short story writing task to test whether L1 German speakers interpret generic singular *they* as more gender-neutral than generic masculine *his*, we found a significant (but weak) effect in support of this hypothesis. Directly comparing a generic masculine form with a more gender-neutral alternative allowed us to attribute at least parts of the bias of the generic masculine to its linguistic form itself, rather than to a general, non-linguistic people = male bias. We have discussed different directions in which such an effect can be interpreted to be influenced by L1–L2 transfer effects, which for L1 German speakers may strengthen the male bias of generic masculine *his*, and either enhances or reduces the difference in bias strength of generic masculine *his* compared to generic singular *they*. We have also suggested that future studies should pay close attention to proficiency as an additional factor modulating the transfer of gender bias. Finally, we have argued in favor of the short story approach as a method that allows for implicit testing of linguistic gender bias in an elegant way and yields rich data that can also be used for other purposes. We hope to spark further research in this direction that tests more alternative forms in more languages with larger datasets, and we are excited to observe which journey generic singular *they* and similar alternatives (for example, neopronouns like *ze*/*hir*, *fae*/*faer*, or *ey*/*em*) will take.

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5 Also see again the supplementary materials at https://osf.io/hbm3n, accessed: 16 July 2023.

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