Can gender-fair language reduce biased representation of gender?

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1 Introduction

In French and other languages with sex-based gender, the masculine and feminine plural are used asymmetrically when referring to groups of humans, with mixed groups of men and women requiring the masculine form. This asymmetry has intersected with heated social debates about gender equality. Two gender-fair alternatives to the generic use of the masculine are the use of a double-gender form (1a) and of an innovative form called inclusive writing (‘*écriture inclusive’*) (1b).

(1) a. *Les caissiers et caissières sont en grève.*
‘The cashiers$_{masc}$ and cashiers$_{fem}$ are on strike.’
b. *Les caissier·ère·s sont en grève.*
‘The cashiers $_{masc.fem}$ are on strike.’

Previous experimental studies – mainly in French and German – have found that gender-fair forms yield a stronger representation of women in mental representations than masculine forms (Brauer & Landry, 2008; Braun et al., 1998; Gabriel & Mellenberger, 2004; Gygax & Gabriel, 2008; Horvath et al., 2016; Kollmayer et al., 2018; Stahlberg et al., 2001; Stahlberg & Sczesny, 2001). Our study addresses two questions: First, how does French inclusive writing fare compare to the double-gender form? Second, is the effect of linguistic form modulated by gender stereotype?

2 General method

French participants read a short text on a professional gathering and estimated the percentage of women present in the gathering, using a response slider. Each participant was tested in a single trial. We deliberately used this complete between-participants design such as to avoid the emergence of response strategies.

The participants first read the text, shown in (1) at their own pace. After a button press, the text disappeared and participants were asked to reply to two attention check questions, and next to estimate the percentages of women and men in the fictional assembly. To do so, they moved an indicator on a horizontal slider, where the indicator initially appeared in the middle. There were two versions of the slider, according to whether the left and right endpoints referred to 100% men and 100%-women, respectively (men-women version), or the reverse (women-men version), as indicated by pictograms of a man and a woman.

(2) *Le rassemblement régional des PROFESSION NAME a eu lieu cette semaine à Amiens. La localisation centrale de cette ville a été particulièrement appréciée. Les PROFESSION NAME ont aussi adoré l'apéro offert à l'hôtel de ville le premier jour.*
‘The regional gathering of PROFESSION NAME took place this week in Amiens. The central location of this city was particularly appreciated. The PROFESSION NAME also loved the aperitif offered at City Hall on the first day.’

Participants were randomly assigned to a linguistic form, a stereotype (Exp. 2 only), and a slider direction. Within each group, participants were randomly assigned to one of six professions with the relevant stereotype.

Results were analysed in linear mixed-effects models using the *lme4* package (Bates et al., 2015) in *R*, with the relevant contrast-coded fixed factors and their interactions, and a random intercept for Profession. Statistical significance was assessed by means of the Anova function in the *Car* package (Fox & Weisberg, 2019). Restricted analyses with corrections for multiple comparison (mvt method) were carried out with the *emmeans* package (Lenth, 2020).

Both of the following experiments were preregistered on OSF (design, number of participants, analysis plan). For convenience, we report the results of the models without Slider direction and its interactions, as they never affected the estimated %-women and omitting these terms did not change any of the results.

3 Experiment 1

We focused on neutral-stereotyped professions, e.g. musician, and compared three linguistic forms, i.e. masculine plural (e.g., *musiciens*), double-gender (e.g., *musiciens et musiciennes*), and inclusive writing (e.g., *musicien·ne·s*).

3.1 Method

Six gender-neutral professions whose French names have grammatical gender marking were chosen from the French part of a norming study (Misersky et al., 2013). The estimated proportions of women in these professions are between .47 and .51 (M = .49, SD = .01). One hundred and fifty-three native French speakers living in France, 67 women and 86 men aged between 22 and 39 years (M = 30, SD = 2.7), participated. The mean number of participants per condition was 25 (min = 24, max = 26).

3.2 Results

Boxplots of the estimated percentages of women as a function of linguistic form are shown in Figure 1.

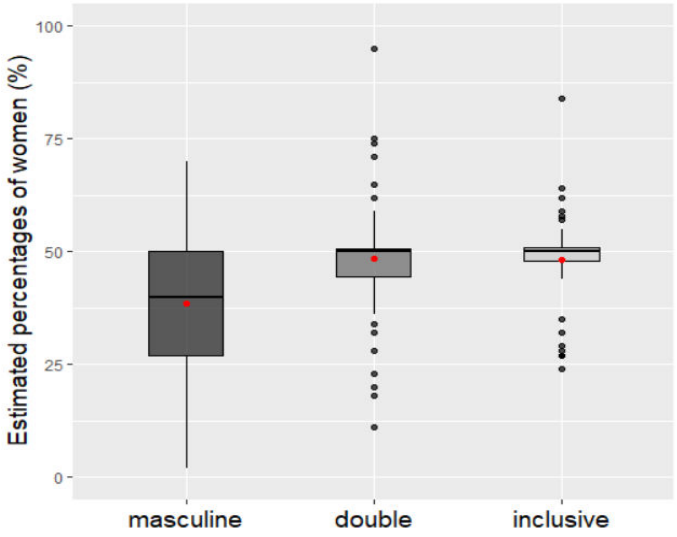

Figure 1. Boxplots of estimated percentages of women as a function of linguistic form. Means are indicated by red dots.

The results of the regression model are shown in Table 1.

Table 1. Results of linear mixed-effects regression

	β	*SE*	*t*	χ^2	*Df*	*p*
Form				18.54	2	< .0001
double	3.41	1.53	2.23			
inclusive	3.11	1.52	2.04			

Restricted analyses showed that compared to the masculine plural form, higher estimates of %-women were obtained for the double-gender form (β = 9.92, SE = 2.64, t(146) = 3.76, p < .001) and the inclusive form (β = 9.63, SE = 2.63, t(146) = 3.67, p < .001). By contrast, there was no difference between the double-gender and inclusive forms (t < 1).

4 Experiment 2

As in Experiment 1, we compared the masculine form to the double-gender and inclusive writing forms, but we used male- and female-stereotyped professions. This design allowed us to examine whether the effect of linguistic form is modulated by stereotype.

4.1 Method

Six male- and six female-stereotyped professions whose French names have grammatical gender marking (e.g., *électriciens – électriciennes* 'electricians$_{masc/fem}$', *esthéticiens – esthéticiennes* 'beauticians$_{masc/fem}$') were chosen from the French part of the same norming study as used in Experiment 1 (Misersky et al., 2013). All professions were selected from among those with mean estimated proportions of men or of women, respectively, above .70 (male-stereotyped, M_{men} = .81 SD = .03; female-stereotyped: M_{women} = .78, SD = .05). Three hundred and five native French speakers living in France, 158 women, 145 men and two of other gender, aged between 20 and 40 years (M = 28, SD = 5.3), participated. The mean number of participants per condition was 25 (min = 24, max = 28).

4.2 Results

Boxplots of estimated percentages of women as a function of stereotype and linguistic form are shown in Figure 2. The results of the regression model, shown in Table 5, revealed effects of Stereotype and Linguistic form, but no interaction. Restricted analyses showed that compared to the masculine form, higher estimates of %-women were obtained for the double-gender form double-gender form (β = 7.16, SE = 2.55, t(290) = 2.81, p < .02) and the inclusive form (β = 9.44, SE = 2.57, t(290) = 3.67, p < .001). By contrast, there was no difference between the double-gender and inclusive forms (t < 1).

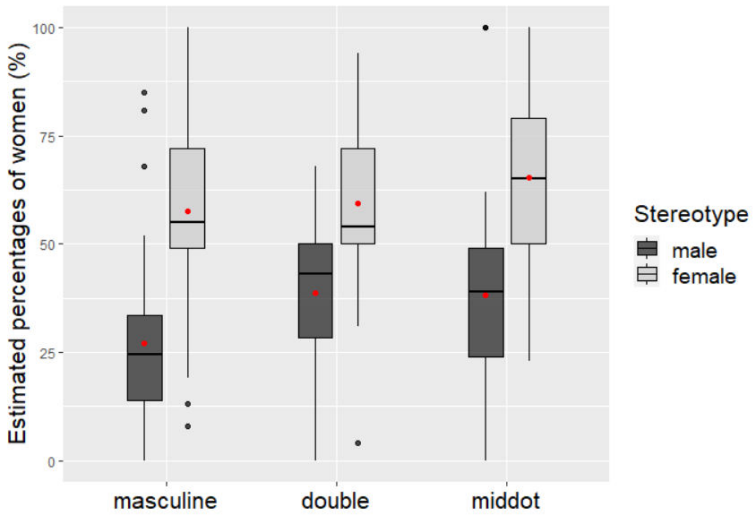

Figure 2. Boxplots of estimated percentages of women as a function of linguistic form and stereotype. Means are indicated by red dots.

Table 2. Results of linear regression

	β	SE	t	χ^2	Df	p
Stereotype(male)	-13.2	1.73	-7.64	58.4	1	< .0001
Form				14.82	2	< .001
double	1.62	1.48	1.10			
inclusive	3.91	1.49	2.62			
Stereotype × Form				3.82	2	0.15
male:double	2.66	1.48	1.80			
male:inclusive	-0.38	1.49	-0.26			

5 Discussion

In both experiments, we observed lower estimates of %-women for the masculine form than for the double-gender and inclusive forms, with no difference between the latter two. Experiment 2 additionally revealed an effect of stereotype, with lower estimates for male- compared to female-stereotyped professions, but this effect did not interact with that of linguistic form.

Thus, double-gender and inclusive forms increase estimations of the percentage of women to the same extent, and this increase is not larger (or, for that matter, smaller) when women represent the minority gender. Yet, even though there was no interaction between linguistic form and stereotype in Experiment 2, the numerical pattern does suggest that the double-gender form increased the estimations of the percentage of women more for male-stereotyped professions than for female-stereotyped ones. It is possible that there is a real interaction but that our experiment was underpowered.

Only two previous studies have examined the question of an interaction between linguistic form and stereotype, comparing the masculine to a double-gender form. For French, Brauer & Landry (2008) observed no interaction either. For German, by contrast, Braun et al. (1998) did report the expected interaction; that is, the double-gender form increased the percentage of estimated women for male- but not for female-stereotyped professional groups. In a post-hoc analysis that leaves out the data for the inclusive writing form, our results from Experiment 2 show the same interaction. Further research should shed more light on this issue.

Our results add to the evidence that the use of gender-fair forms increases the presence of women in mental representations. As to the double-gender form, future research could examine whether reversing the order, putting the feminine before the masculine, might further increase the presence of women in mental representations. This would be congruent with research suggesting that the order of words in a binomial phrase concurs with differential cognitive accessibility and relevance to a context (Kesebir, 2017; Tachihara & Goldberg, 2020).

Little is known about whether the representations yielded by gender-fair forms adequately reflect the proportion of men and women – real or perceived – in specific societal groups or in the society as a whole. To address this question, we carried out post-hoc analyses to compare our results to a benchmark defined by Misersky's norming data. For this, we subtracted for each profession and each participant the normed estimation of %-women from the participant's estimation, and constructed intercept-only models with this difference score as dependent measure and a random intercept for Profession. Thus, a positive estimate for the intercept in these models would indicate an overestimation of the presence of women compared to the benchmark and a negative estimate an underestimation.

For the gender-neutral stereotyped professions in Experiment 1, we found that the masculine form yielded an underrepresentation of women compared to the benchmark (β = -10.66, SE = 2.73, t = -3.91, $p < .02$), while those for the double-gender and inclusive forms did not differ from the benchmark values (double: β = -0.80, $|t| < 1$; inclusive: β = -1.01, $|t| < 1$). Thus, these results suggest that the use of the masculine plural induces a male bias of an estimated 11 percent point, while that of the alternative forms induces an adequate representation of the proportion of women. For the professions with a male- or a female-gendered stereotype in Experiment 2, the results were different, though. For the male-stereotyped professions the double-gender and inclusive forms yielded an overrepresentation of women (double-gender: β = 19.26, SE = 2.02, t = 9.52, $p < .0001$; inclusive: β = 19.18, SE = 3.00, t = 6.40, $p < .003$), with the masculine form trending in the same direction (β = 7.47, SE = 3.19, t = 2.34, $p < .07$). For the female-stereotyped professions, conversely, all three forms yielded an underrepresentation of women (masculine: β = -20.24, SE = 3.63, t = -5.57, $p < .003$; double-gender: β = -17.89, SE = 2.97, t = -6.02, $p < .002$; inclusive: β = -12.39, SE = 2.83, t = -4.37, $p < .0001$). Thus, these latter results suggest that none of the linguistic forms induced an adequate representation of the proportion of women for either male- or female-stereotypes professions. Yet, a possible alternative explanation of our pattern of results is that participants in our experiment were more reluctant to indicate extreme values than those in Misersky's norming study. This could be the case, for instance, because we tested them on a single trial, whereas the participants in the norming study gave estimates for more than 200 professions.

4 Conclusion

To conclude, we showed that the generic use of the masculine plural and gender-fair alternatives differentially impact how people mentally represent and estimate gender ratios. In addition to providing insights into the processing of these different linguistic forms, our results add important data to fuel public debate around gender-fair language.

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