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How does whether a gendered language is spoken at home impact an individual's gender ideology?

Introduction and Research Question

Humans use language as a tool to absorb and to express their thoughts and perception of the world. The use of language in everyday life for humans to share ideas, thoughts and feelings with others shows the role of language in shaping how people view the world. This relation of language and thought is studied by the U.S. linguists Edward Sapir and Benjamin Lee Whorf. In their linguistic relativity hypothesis, they proposed that the language spoken by a person could influence his or her perception and thought. To extend this idea, I explore how language affects the speakers' perception of women in a society by using a measure of whether various languages are gendered, defined as when "all nouns in a language are grouped into classes, there is grammatical agreement between nouns and their dependent words or elements (e.g., articles, adjectives, verbs), and the class membership of nouns shows a considerable semantic correlation with sex (masculine, feminine and, or neuter)" (Gygax et al. 2019). This paper aims to answer the main question of: **How does whether a gendered language is spoken at home impact an individual's gender ideology?** Further, the paper addresses sub research questions through its control and interaction models such as: **Whether gendered language has more of an effect on ideology for women? Whether gendered language has more of an effect on ideology for higher education?**

Based on the literature on gendered language and its role in the treatment of women that argue gender prejudice occurs more in societies of gendered languages rather than genderless languages (DeFranza et al. 2020; Gygax et al. 2019), I hypothesize that gendered languages would contribute to an inegalitarian gender ideology. The language structure centered around gender could reinforce gender conception and potentially enhance any gender stereotypes a society has and result in a less egalitarian gender ideology. Additionally, for the specific research questions, I hypothesize that the gendered language would have less effect on ideology for women as the inegalitarian ideology disadvantages women and that gendered language would have less effect on ideology with higher education, as higher education would diffuse the inegalitarian gender ideology.

Data and Methods

To explore the question of the relationship between gendered language and gender ideology, I use the sixth wave of World Values Survey (WVS) data, collected through 2010 to 2014.[1] Its raw data includes responses by 86,272 individuals, diverse in age and country, making it a representative sample of measuring the values of the world.

For the independent variable, I constructed a binary variable called "gender_lang" to indicate if the language normally spoken at home (V247) is a gendered language. Sorting the language by its frequency in the data sample, top 25 frequent languages were selected and classified. Out of 25, 22 languages were matched up with a gender tag, where 11 were genderless (English, Chinese, Japanese, Turkish, Georgian, Mandarin, Armenian, Malay, Estonian, Cantonese, Azerbaijani) and 11 were gendered (Arabic, Spanish; Castilian, Russian, German, Dutch; Flemish, Portuguese, Romanian, Swedish, Slovenian, Polish, Hindi

[1] "WVS Database," accessed January 29, 2020, http://www.worldvaluessurvey.org/wvs.jsp

Given these criteria, 70.6% of the 86,272 individuals were labelled, 24.1% as speaking a genderless and 46.5% as speaking a gendered language. Those individuals whose language that could not be classified were dropped from the analysis.

For the dependent variable, I have identified statements related to gender role[2] on which the respondents had to indicate their positions: V45, V47-48 and V50-54. I recoded each variable so that each was scaled into 0-10, where 10 represented the most egalitarian gender ideology and 0 would be the least egalitarian. This requires reverse-coding two items, V48 and V54, which had been coded such that higher score signified more inegalitarian ideology. When using t-tests for differences in means between those speaking gendered and nongendered languages for each dependent variable, V48 and V54 were the only values that did not show a significant difference. The dependent variables with statistically significant difference all had a higher means for genderless language compared to the mean for gendered language. This means that the gendered language speakers are shown to have a significantly more conservative view on women, since more gendered-language respondents scored lower in these scaled values than genderless-language respondents.

Table 1: Differences in Means for each Dependent Variable Components

	Questions	P-value of t-test	Mean for Genderless Language	Mean for Gendered Language
V45	"When jobs are scarce, men should have more right to a job than women."	7.41e-07	5.511	5.323
V47	"If a woman earns more money than her husband, it's almost certain to cause problems."	2.07e-05	5.965	5.814
V48	"Having a job is the best way for a woman to be an independent person."	0.375	6.930	6.960
V50	"When a mother works for pay, the children suffer."	<2.2e-16	5.483	4.626
V51	"On the whole, men make better political leaders than women do."	<2.2e-16	5.166439	4.730
V52	"A university education is more important for a boy than for a girl."	2.27e-10	6.815	6.656

[2] Refer to the table below for specific statements

V53	“On the whole, men make better business executives than women do”	< 2.2e-16	5.621	5.268
V54	"Being a housewife is just as fulfilling as working for pay"	0.084	6.157	6.114
gender_ ideology	Combined Factor	< 2.2e-16	5.975	5.641

Combining these individual gender ideology factors to an accumulative gender ideology indicator, “gender_ideology”, the selected 8 factors above were averaged. This averaged indicator, showed statistical significance in their difference of mean between speakers of gendered and genderless language. Although respondents speaking both kinds of languages generally leaned towards an egalitarian view in the combined gender ideology dummy variable, within the 5 to 6 range out of 10, the mean of gendered language speakers was around 0.334 lower than genderless language speakers.

With the gender language dummy variable as the independent variable and the averaged attitudinal variable as the dependent variable, I use OLS (Ordinary Least Squares) regression, additive terms, and interaction terms between variables to explore the sub-research questions. In doing so, I introduce control variables of “female”, a dummy variable for the gender of the respondent where 0 is male and 1 is female, and “education_cat”, a dummy variable for education category for Primary, Secondary, University level which includes any partial completion of such education category. Further, the previously mentioned control variable of “female” and another dummy variable “male” of similar nature are explored as interaction variables in laying out the distinct effects of gender language on different gender.

Results

To analyze this data, I use nested OLS regression models predicting gender ideology score from additive term of the female variable, additive terms of the education variable, and

interaction terms of gender. Specifically, I utilize the following 6 models to address the sub research questions: 1) Base case: Predicting Gender ideology based on genderness of language, 2) Base case and control for gender, 3) Base case and control for education category, 4) Base case and interaction of genderness of language and gender, 5) Base case and interaction of genderness of language and gender (female) with control for education category, and 6) Base case and interaction of genderness of language and gender (male) with control for education category.

Model 1 is illustrated in table 2, where the gender ideology by the genderness of language spoken at home with gender as control, which are equally exogenous to gender ideology. Before adding any control variables to the model including just the gender of the language, there is a statistically significant negative relationship between gendered language and egalitarian gender ideology, with a coefficient of -0.335. This means that averaged gender ideology score for genderless language is 5.975 (the intercept) and 5.640 (the intercept plus -.335) for gendered language.

Table 2: Nested OLS Regression Models Predicting Gender Ideology from Genderness of Language Spoken at Home and Controls of Female

	Dependent variable:	
	Gender Ideology	
	(1)	(2)
Gendered Language	-0.335***	-0.327***
	(0.019)	(0.018)
Female		0.826***
		(0.017)
Constant	5.975***	5.529***
	(0.015)	(0.017)
Observations	51,024	50,996
R^2	0.006	0.049
Adjusted R^2	0.006	0.049
Residual Std. Error	1.985 (df = 51022)	1.942 (df = 50993)
F Statistic	326.336*** (df = 1; 51022)	1,316.696*** (df = 2; 50993)
Note:		*p<0.1; **p<0.05;** p<0.01*

For model 2, when I control for gender, on average, females are 0.826 point more egalitarian than males, on average. There continues to be a statistically relevant positive relationship between gendered language and gender ideology with the female indicator controlled, with a coefficient of -0.327. The causal effect of genderness of language is the approximately the same whether we control for gender, probably because gender is uncorrelated with gendered languages, since societies speaking both kinds of languages do not drastically differ in their sex ratio.

Then, model 3, predicting gender ideology from the genderness of language spoken at home, adding education as control, was conducted and shown in table 3. With a control of education, there continues to be a statistically significant negative relationship between gendered language and gender ideology, with a coefficient of -0.200. However, the estimated effect of gendered language is reduced by over 1/3 after the control for education. Gendered language is exogenous to education level, given that people are born into a particular language community. Thus, education level is intervening between gendered language and gender ideology in the causal order. Education is mediating some of the effect of gendered language on gender ideology. We observe the magnitude of the coefficient decreasing from 0.335 to 0.200 with the control. The effect of the gendered language on gender ideology is partly indirect through education level and -0.200 would be the best estimate of the direct effect of the genderness language to gender ideology. As for the effect of education, we observe that as one's education level gets higher, gender ideology is more egalitarian. Therefore, for instance, university level education, the highest listed education level, would lead to a predicted gender ideology 1.752 points higher than seen for those with no education, indicating a more egalitarian gender ideology.

Table 3: Nested OLS Regression Models Predicting Gender Ideology from Genderness of Language Spoken at Home and Controls of Education

	Dependent variable:	
	Gender Ideology	
	(1)	(2)
Gendered Language	-0.335***	-0.200***
	(0.019)	(0.019)
Primary		0.958***
		(0.045)
Secondary		1.406***
		(0.041)
University		1.752***
		(0.043)
Constant	5.975***	4.508***
	(0.015)	(0.042)
Observations	51,024	50,467
R^2	0.006	0.045
Adjusted R^2	0.006	0.045
Residual Std. Error	1.985 (df = 51022)	1.946 (df = 50462)
F Statistic	326.336*** (df = 1; 51022)	596.651*** (df = 4; 50462)
Note:		*p<0.1;* ***p<0.05;*** p<0.01

This suggests that there might be higher level of education in societies that have genderless languages. When I conducted a crosstabulation of this data, this turns out to be true, as shown in table 4. There is a higher distribution of education among those who speak genderless than gendered languages, and this is true for both genders. There is a general concentration in some secondary or university education in both groups. Additionally, we observe that there is an even higher proportion of genderless language speaker with some secondary or university education than gendered language speaker for both genders. When seeing specifically at the university level education, this gap is more eminent in female than male. Females are 5.4% more likely to attain some university education (0.054 = 0.318 - 0.264) compared to males who are 4.9% more likely (0.049 = 0.337-0.288) when they speak a genderless language at home. This might suggest that genderness of language actually affects how much the society encourages education, and more so in females than males.

Table 4: Distribution of Education between Gender					
Gender	Type of Language	None	Primary	Secondary	University
Female	Genderless Language	0.026	0.111	0.545	0.318
	Gendered Language	0.077	0.179	0.481	0.264
Male	Genderless Language	0.013	0.099	0.551	0.337
	Gendered Language	0.048	0.173	0.492	0.288

In exploring the claim that the genderness of language might actually affect how much the society encourages education, and more so in females than males, the interaction term of female variable was used along with the independent variable of genderness of language to predict the gender ideology score when education is controlled in model 5 as shown in table 5.

Table 5: Nested OLS Regression Models Predicting Gender Ideology from Genderness of Language Spoken at Home & Gender and Control of Education

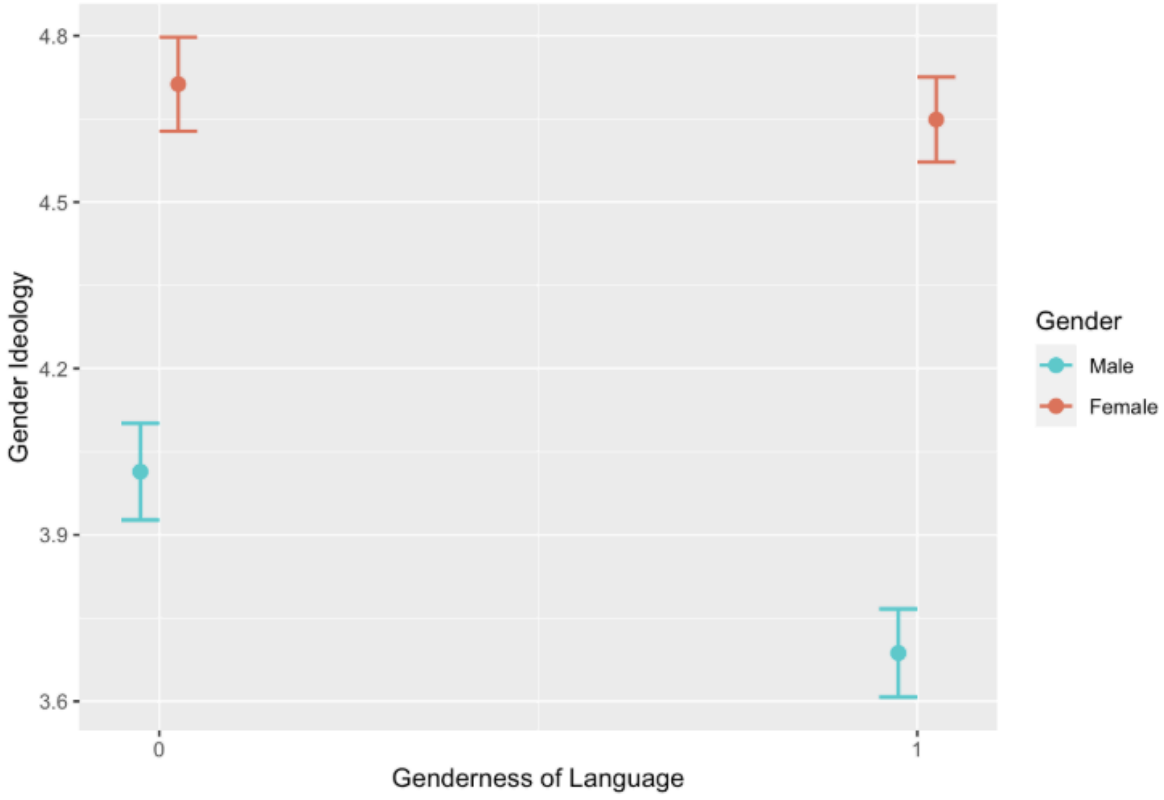
	Dependent variable:		
	Gender Ideology		
	(1)	(2)	(3)
Gendered Language	-0.458***	-0.327***	-0.064***
	(0.027)	(0.026)	(0.025)
Female	0.665***	0.699***	
	(0.029)	(0.029)	
Male			-0.699***
			(0.029)
Primary		1.059***	1.059***
		(0.044)	(0.044)
Secondary		1.523***	1.523***
		(0.040)	(0.040)
University		1.883***	1.883***
		(0.042)	(0.042)
Gendered Language:Female	0.245***	0.263***	
	(0.036)	(0.036)	
Gendered Language:Male			-0.263***
			(0.036)
Constant	5.616***	4.014***	4.713***
	(0.022)	(0.045)	(0.043)
Observations	50,996	50,452	50,452
R^2	0.050	0.094	0.094
Adjusted R^2	0.050	0.094	0.094
Residual Std. Error	1.941 (df = 50992)	1.896 (df = 50445)	1.896 (df = 50445)
F Statistic	893.715*** (df = 3; 50992)	870.662*** (df = 6; 50445)	870.662*** (df = 6; 50445)
Note:			*p<0.1; **p<0.05;** p<0.01*

Based on model 5, holding education constant, a female who speaks a genderless language at home is 0.699 more egalitarian in gender ideology than a male who speaks a genderless language. Speaking a gendered language increases the positive effect of being female by 0.263. Compared to model 4, where there is no control for education, in model 5, there is a decrease in the coefficient of gendered language. This decrease shows the lasting mediating effect of the education variable, when interacting with female variable, as shown in model 3. In model 4, a female who speaks a genderless language at home is 0.665 more egalitarian in gender ideology than a male who speaks a genderless language. Speaking a gendered language increases the positive effect of being female by 0.245. Thus, we can compute the total effect of speaking a gendered language is -0.213 (=-0.458 + 0.245) in female and -0.458 in male in model 4 and that the net effect of speaking a gendered language is -0.064 (= -0.327 + 0.263) in female and -0.327 in male when education is controlled in model 5. Although -0.064 is a very miniscule difference, as shown in model 6, the coefficient of gendered language is in fact statistically significant. This means that speaking a gendered language for female is also statistically significant when education is controlled. However, the drop in the effect of speaking a gendered language for female when controlled for education, leading to a net effect close to 0, shows the extent that education decreases effect of gendered, whereas such the difference between total and net effect is smaller for males.

When model 5 is graphed, that distinction between the genders is shown. Although there is an overall higher gender ideology score in female compared to men, steeper negative slope of the male compared to the female model shows that the effect of gendered language, in making people less egalitarian, is stronger in men when education is controlled. Education is mediating the part of effect for both men and women, such that what is left is -0.064 in women and -0.327 in men. Further, the difference of scores between gender increases in the gendered language compared to genderless language. This increasing gender gap in gendered

language shows that the gender difference in ideology is larger among those speaking a gendered language.

Figure 1: Predicted Gender Ideology by Genderness of Langauge with Control of Education



Conclusion

In conclusion, there is sufficient evidence to support the main hypothesis that speaking a gendered language does in fact cause a more inegalitarian view on women. Further, gendered language has less of an effect on ideology for higher education throughout. Education mediates the effect of speaking a gendered language at home, and higher education leads to a more egalitarian gender ideology. In addition, we find that women in general show a more egalitarian view and those with more education have a more egalitarian view.

Gendered language has more of an effect on ideology for males than females. This phenomenon is illustrated when gender interacts with gendered language and not when

gender is controlled. When interaction between genderness of language and gender controlled for education, education mediates the part of effect for both men and women, explaining almost all the net effect in women and not for men. Furthermore, we see an interesting finding such that speaking a gendered language has a larger negative impact on men's compared to women's egalitarianism and that the gender difference is larger among those who speak a gendered language.

Citation:

DeFranza, D., Mishra, H., & Mishra, A. (2020). How language shapes prejudice against women: An examination across 45 world languages. *Journal of Personality and Social Psychology, 119*(1), 7-22. http://dx.doi.org/10.1037/pspa0000188

Gygax PM, Elmiger D, Zufferey S, Garnham A, Sczesny S, von Stockhausen L, Braun F and Oakhill J (2019) A Language Index of Grammatical Gender Dimensions to Study the Impact of Grammatical Gender on the Way We Perceive Women and Men. *Front. Psychol.* 10:1604. doi: 10.3389/fpsyg.2019.01604