Gender in Language and Gender in Employment

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Abstract

Women lag behind men in many domains. Feminists have proposed that sex-based grammatical gender systems in languages reinforce traditional conceptions of gender roles, which in turn contribute to disadvantaging women. This article evaluates the empirical plausibility of this claim in the context of the labour market outcomes of women. Based on a sample of over 100 countries, the analysis shows that places where the majority language is gender-intensive have lower participation rates of women in the labour force. Individual level estimates further underscore this finding and indicate a higher prevalence of gender-discriminatory attitudes among speakers of gender-intensive languages.

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1. INTRODUCTION

In spite of significant improvements based on economic development, women still lag behind men in their degree of labour market participation in many places in the world (e.g. UNDP, 2010). The persistence of traditional views on gender roles has been a significant countervailing force for progress in important dimensions of women's empowerment (Akerlof and Kranton, 2000; Duflo, 2005). In particular, beliefs about the appropriate role of women in society affect the labour market attachment of women (e.g. Fortin, 2005). That culture matters has also been demonstrated for the case of second generation immigrant women, by linking their fertility and labour market outcomes to those of women in their countries of ancestry, assuming that both share the same cultural background (e.g. Fernández and Fogli, 2009). These approaches explain the differences in outcomes by differences in self-reported cultural beliefs or ancestral cultures, as proxied by home country outcomes of women. What remains largely unexplained, however, is why we find differences in cultural gender biases to begin with.

As Fernández (2008) notes, "the rigorous study of culture and economics is in its infancy" and the question of how cultures propagate and change has yet to be fully understood. A recent article by Alesina *et al.* (2011) makes a first attempt in accounting for the origins of gender roles by tracing them back to traditional agricultural practices. The authors show that societies that traditionally practiced plough agriculture have lower female labour force participation and higher prevalence of attitudes favouring gender inequality today. The present article aims to advance this line of research by investigating the role of language gender systems as a source for the persistence of gender-biased cultures and thereby ultimately as an explanation for gender inequalities in labour market outcomes.

It is estimated that there are nearly 7000 languages in the world today (Boroditsky, 2011). One of the many ways in which these languages differ is their gender systems. A language possesses a gender system if it has classes of nouns which require specific inflectional agreement with other elements in the sentence (e.g. Corbett, 1991). Differences in gender are typically associated with distinctions in biological sex. The pervasiveness of sex-based gender systems varies across languages. In some languages, gender is evident in almost every phrase, while in other languages it is entirely absent (Corbett, 2008a). Finnish is an example of a language without a gender system. In English, pronouns in the third person are

the only evidence for gender[1], while in Hebrew gender is reflected also in the second person pronouns as well as in several other forms of agreement (e.g. nouns, verbs). As a result, there is a varying reference to gender in the use of these languages, a fact that has attracted a great deal of feminist concern.

There is a longstanding view among feminist scholars that gender systems in language promote gender inequalities (e.g. Spender, 1985; MacKinnon, 1989). Male dominance requires the belief that men and women are different from each other in important ways. That belief is perpetuated by the constant requirement among speakers of gendered languages to make explicit sex-based distinctions (Frye, 1983). Moreover, certain language gender structures are believed to subordinate women and to render them "invisible" (e.g. by using the masculine plural form of pronouns as a device of generic reference to humans in some language).[2] These views are broadly supported by an influential line of thought in the humanities suggesting that languages significantly shape our representation of the world (e.g. von Humboldt, 1836 (translated in: von Humboldt, 1999); Whorf, 1957).

Even though feminist criticism of gendered languages has been voluminous and influential, not much is known about whether gender systems in languages do in fact affect the gaps in outcomes across genders. That notwithstanding, numerous reforms to make languages more gender-neutral have been initiated or proposed, with the hope that these reforms will lead to more gender-equal outcomes. In Sweden, for example, the promotion of new gender-neutral terms and ways of communicating has recently been actively pursued not only by feminist movements, but also by the Swedish Language Council (Miles, 2011). Some feminists have even proposed the introduction of a new language as a path to gender equality (e.g. Elgin, 1985). Given the costliness of such reforms, it is important to study the empirical plausibility of the underlying assumption: is it really the case that linguistic gender systems are linked with gender inequalities in outcomes? This article presents the first attempt in that direction, by studying the implications of linguistic gender systems in the context of labour force participation.

The article uses a sample of over 100 countries to show that places with gender-intensive majority languages have lower participation rates of women in the labour force.

[1] When the referent of the pronoun is of male biological gender, English prescribes the use of the pronoun "he", while it requires the pronoun "she" when the speaker is talking about someone of female biological gender. Compare, for instance: "Barack Obama was elected in 2008. *He* will run again for office in 2012." and "Michele Obama is the first lady since 2008. *She* hopes that Obama will run again in 2012".

[2] See Saul (2010) for an overview of feminist critiques of gendered languages.

Based on the World Values Surveys, it documents a negative effect of the gender-intensity of the language spoken at home on the employment probability of women. It does not find an effect on men's employment probability. Furthermore, the possession of a more gender-intensive language is associated with a prevalence of more discriminatory attitudes over women's equal access to jobs. Overall, these results are consistent with the claims of feminists on adverse effects of gendered languages on women's outcomes. They furnish some support for initiatives to make languages more gender-neutral on grounds of efficiency.

There is evidence from psychology for the existence of cognitive effects of linguistic gender systems: studies have shown that speakers of languages with sex-based grammatical gender are likely to attribute stereotypical masculine or feminine traits to nouns in the respective categories (Boroditsky *et al.*, 2002). Beyond projecting gender features onto the world, speakers of gender-intensive languages also come to attain their own gender identity earlier than those from less-gendered language backgrounds (Guiora *et al.*, 1982). However, these studies have not considered whether women's actual outcomes are affected.

There are only two other grammatical features which have so far been studied by economists. The linguistic practice of pronoun drop has been used to instrument for cultural emphasis on autonomy versus embeddedness (Licht *et al.*, 2007) and for family ties (Alesina and Giuliano, 2007). More recently, Chen (2011) studied the effect of being required to speak in a grammatically distinct way about future events on future-oriented actions, including saving and health behaviours of speakers, demonstrating a significant relation between the two. The current article presents a further contribution to the newly emerging literature on language structures and economic behaviours.

The following section outlines the empirical approach and data. Section 3 presents the results, and Section 4 concludes.

2. EMPIRICAL STRATEGY AND DATA

2.1 Measurement of gender-intensity of languages

The subject of this paper is the influence of the linguistic manifestation of sex-based distinction amongst persons on economic outcomes. An apt way to measure the gender-intensity of a language is with reference to its personal pronoun system. Based on the World Atlas of Language Structures (Siewierska, 2008), languages are categorised into three groups: 1. those with no gender distinction in pronouns, 2. those with gender distinction in third-

person pronouns only, and 3. those with gender distinction in third-person but also the first and/or the second person. For ease of exposition, these will be referred to as 1. gender-neutral, 2. mildly gendered and 3. strongly gendered languages. In all regressions the independent variables of interest are dummies for mildly gendered and strongly gendered languages (Lang gender1 and Lang gender2), with the gender-neutral languages being the excluded category.

While the World Atlas is the main source of data, a small number of missing values, where available, were filled through consultation of various web-based linguistic sources. Table 1 presents the language gender data for selected languages. For instance, Finnish has no gender distinction in its pronouns - thus its gender appears as zero in the Table. English, on the other hand, is an example of a mildly gendered language, as its third person pronouns distinguish across genders. However, it has no further distinction in the first and/or the second person. An example of a language in the latter category is Hebrew, encoded as two in the Table.

The effects of gender-intensity of languages are analysed at the level of countries, as well as at the level of individuals. Next, empirical strategies and data used in each case are presented.

2.2 Country level analysis

The dependent variable in the cross-country analysis is the share of women in the labour force in 2000. Language gender dummies are defined with reference to the language spoken as "mother tongue" by the majority population (source: Alesina *et al.*, 2003). The relationship between the female share of labour force and language gender dummies is examined in a regression framework which includes a set of important controls.

Given that the respective gender category is assigned to the language of the majority population, the share of the population comprising the linguistic majority is accounted for. Women's labour force participation is expected to depend on economic development, captured by the logarithm of GDP per capita and its squared term.[3] Government size, measured as the government share of GDP, is controlled for to reflect the possibility that

[3] Previous studies have suggested a U-shaped relationship between economic development and women's share of the labour force (e.g. Çağatay and Özler, 1995; Goldin, 1995). To allow for various forms of nonlinearities, models including cubic and quartic terms of the logarithm of GDP per capita were also estimated, with no effect on the results (available on request).

larger governments may stimulate women's labour force participation. To account for potentially differential effects of greater exposure to the world economy on men and women, openness, measured as the sum of exports and imports in GDP, is included in the list of controls.

Production structure, and in particular oil production has been shown to reduce the share of women in the labour force (Ross, 2008). Accordingly, oil rents per capita are accounted for. Conversely, democracies may have more women in the labour force. The control for democracy is defined based on polity scores of 0 (least democratic) to 10 (most democratic) (Marshall and Jaggers, 2009). Moreover, the regressions include a measure of country size (logarithm of population). Urban and rural areas may have differential employment patterns of women. To reflect that, urban share of population is also included in the list of controls. Protestant, Catholic, Muslim, Jewish Hindu and Buddhist shares of populations are controlled for to reflect the effects of religious traditions on gender roles. To represent the effect of communist policies on women's employment, a dummy for countries' communist past is included. Finally, dummy variables for developed Western countries (the OECD countries excluding Japan and Korea), Latin America, Sub-Saharan Africa, East Asia, and North Africa and the Middle East are added.

The cross-country dataset, assembled from different sources, covers up to 108 countries in 2000. As Table 2 shows, some variables come from standard sources widely used in macro-level empirical studies (Heston *et al.*, 2006; UNESCO, 2007; United Nations, 2007). In other cases, datasets compiled by researchers based on standard sources and used in published articles are used (Alesina *et al.*, 2003; Barro, 2007; Ross, 2008; Rose and Spiegel, 2009). The Table also presents summary statistics. Women's representation in the labour force across countries ranges from 17.21 (Oman) to 52.33 percent (Cambodia) with the average women's labour force participation being around 40 percent. Around 39 and 31 percent of languages are mildly and strongly gendered respectively, with the rest being gender neutral.

The relationship between language gender systems and women's labour force participation is tested using OLS estimations. Still, the effect that potential endogeneity might have on the results is considered. Places that are different for a variety of reasons may differ both in the gender systems of their languages and in women's labour force participation. First, there may be cognitive differences associated with different language structures, correlated with both language gender systems and economic outcomes. Second, given the differences in the degree of prevalence of language gender systems across different parts of

the world, there is a concern over confounding geographic factors. Controls to minimise the distorting effect of these possibilities are included in robustness checks. In spite of this, a possibility for omitted variable bias is hard to rule out entirely. In particular, there may be unobserved cultural elements potentially correlated with both language gender systems and women's labour force participation. Therefore, a 2SLS estimation is carried out, using dummies for eight language families as instruments for language gender dummies. These are the language families that have more than one language represented in the sample.

Grouping languages in the same family signifies that they have a common ancestor, a proto-language. The intuition behind the use of this instrument is the possibility that some proto-language structures might have prompted the emergence of sex-based gender in descendant languages. For example, the proto-Indo-European languages had a noun class system based on animate/inanimate opposition (Luraghi, 2009). Around 55 percent of countries in the sample speak an Indo-European language and only around 12 percent of those languages are gender-neutral.

These countries are geographically rather dispersed, covering parts of Europe, Americas, Australia, but also the Middle East and Asia. The spread of language families is linked to prehistoric times. For example, according to Diamond and Bellwood (2003), the Indo-European language family distributed before 1492 A.D. from Ireland east to the Indian subcontinent and western China. Inclusion of region dummies, as defined above, to a certain extent minimises the concerns over the instruments affecting women's labour force participation through channels other than the language. In addition, an overidentification test to formally validate the exclusion restriction is carried out.

2.3 Individual level analysis

Some of the discussed sources of endogeneity of language gender systems should be of lesser concern when individual-level labour market outcomes are being considered. This is done using the World Values Surveys, a collection of nationally-representative individual-level surveys on a variety of attitudes and preferences. The surveys also include information on standard demographic characteristics, such as gender and labour market status.

The dependent variable of main interest is the employment status of respondents. It is a dummy that equals one if the respondent is full-time, part-time or self-employed and zero if the respondent is a housewife or unemployed. The analysis excludes the retired and students,

and is restricted to the population aged 18-65.[4] Further, the intensive margin, involving part-time employment status is considered as a dependent variable. It is a dummy that equals one if the respondent is employed part-time and zero if the respondent is full-time or self-employed. The hypothesis of feminists regarding linguistic gender systems predicts that these systems may negatively affect the employment of women, but not that of men. Accordingly employment regressions are carried out separately for genders.

In addition to the individual-level analysis of labour market participation, the World Values Surveys allow considering the attitudes on gender roles as an additional dependent variable. Of relevance to the issue of women's employment are the respondents' views on the statement: "When jobs are scarce, men should have more right to a job than women". A dummy variable is defined equal to one for agreement, and zero for disagreement. The assumption about the effect of linguistic gender systems can be associated with traditional gender role attitudes among women as well as men. Consequently, the gender identity of both women and men may be negatively affected when women work (Akerlof and Kranton, 2000).

Language gender dummies are defined with reference to the language spoken at home by the respondents. As a result, the article is restricted to the last three waves of Surveys (carried out in the period from 1994-2007), where information about the language spoken at home was included. The data from different waves are pooled across countries. The correlation between the three dependent variables and language gender dummies is examined in a regression framework which includes country dummies. Consequently, the analysis is restricted to up to 48 countries where multiple languages with varying gender intensities are identified.[5] The regressions also include year dummies, dummies for the size of respondent's residential location as well as the same set of region dummies as in the country-level analysis. To further isolate the effect of language gender systems, a range of individual level characteristics of respondents are included as controls.

While the home language is plausibly of most significance, other languages spoken may matter as well. In particular, recent studies in social psychology have demonstrated that

[4] Given the differences in education and retirement systems across countries, there may be concerns over selection effects. To minimise those, estimations based on the population aged 23-60 were also carried out. The results were quantitatively identical (available on request).

[5] The countries in the sample are Albania, Andorra, Australia, Bangladesh, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Canada, Chile, Cyprus, Egypt, Ethiopia, France, Former Yugoslav Rep of Macedonia, Ghana, Guatemala, India, Indonesia, Iran, Iraq, Jordan, Kyrgyzstan, Malaysia, Mali, Mexico, Morocco, Nigeria, Pakistan, Philippines, Poland, Puerto Rico, Rep of Moldova, Saudi Arabia, Serbia and Montenegro (and successor Serbia), South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, Trinidad and Tobago, United Kingdom, United States, Uruguay, Venezuela, Viet Nam, Zambia.

a single subject's attitudes may vary depending on the languages in which those attitudes are elicited (Danziger and Ward, 2010; Ogunnaike *et al.*, 2010). The World Values Surveys identifies the language in which the interview was conducted. Accordingly, a dummy that equals one if the interview is conducted in the language used at home by the respondent is included. Another dummy included equals one if the interview language is of lower gender intensity than the language spoken at home by the respondent. Dummies for Protestant, Catholic, Muslim, Jewish, Hindu, Buddhist and other religious denominations are included. Those without religious denomination are the excluded category. The regressions control for standard demographic characteristics including age, marital status, number of children, race, health, and education level. Income dummies, based on the scales identified in the Surveys are also included.

3. RESULTS

3.1 Country level estimates

Baseline results. Column (1) of Table 3 presents the estimates of language gender dummies on women's share of labour force on the full sample of countries. The coefficients on language gender dummies are statistically significant. They are also economically meaningful. Countries with mildly gendered majority languages have around 2.3 percentage point less women in the labour force than countries with gender-neutral majority languages. For countries with strongly gendered languages the difference with countries with gender-neutral languages is larger. They have around 4.4 percentage point less women in the labour force.

Language gender dummies explain a sizeable proportion of differences in women's labour force participation across countries. Their inclusion in the model is associated with increase in the R-squared by 0.0169 (0.8219 - 0.8050). Therefore, they account for 1.7 percent of the total variation in women's labour force participation and 8.7 percent of the residual variation in women's labour force participation unaccounted for by the control variables ((0.8219-0.8050)/(1-0.8050)=0.086667).

Estimated coefficients for control variables are generally as expected. The results indicate a positive association between women's labour force participation and the share of the largest linguistic group in the population, which can be viewed as a measure of linguistic homogeneity. This is broadly consistent with observations on positive economic outcomes in

places with homogenous populations (e.g. Easterly and Levine, 1997), and is similar to the finding of a negative effect of ethnic fractionalisation on female labour force participation reported in Feldmann (2007). As in Ross (2008), the coefficient on oil rents per capita is negative, however very small in size. Places with larger Catholic share of population have lower female representation in the labour force. In contrast, the Jewish share of population is positively associated with women's labour force participation. Finally, there is also evidence that countries with communist past have higher participation of women in the labour force. The coefficients on the remaining controls are not significantly different from zero.

The documented association between linguistic gender systems and women's labour force participation may be driven by certain observations in the sample. Several changes to the sample are considered. Arabic is among the highly-gendered languages in the sample. Some of the countries with very low shares of women in the labour force are Arabic-speaking. However, exclusion of Arabic-speaking countries leaves the results largely unaffected (presented in column (2) of Table 3). Column (3) of the Table drops countries where the majority population speaks gender-neutral languages of the Uralic family. These are Estonia, Finland and Hungary, where women's share of labour force is approaching to half. The significance of language gender dummies remains unaffected. Communist traditions have resulted in high rates of women's labour force participation in countries with communist past. The results reported in column (4) are based on a sample that excludes the formerly communist countries where the majority population speaks a gender-neutral language. The coefficients on language gender dummies are significant and larger in size.

To obtain the estimates in the last two columns of the Table, I follow a more formal approach to detect potentially influential observations. According to Donald and Maddala (1993), examination of studentised residuals is the most appropriate method to identify influential observations, even when assessing the influence of observations on individual estimated coefficients. On the basis of studentised residuals, 6 countries are identified as being potentially influential observations. When the model is re-estimated with these countries omitted, the coefficients preserve their significance (column (5)). Donald and Maddala (1993) further recommend the use of leverage in conjunction with studentised residuals in order to detect outliers. Cook's distance is an overall measure of influence that combines information on the residual and leverage into a single statistic. It is applied here, resulting in fourteen countries identified as outliers and dropped from the sample. The significance of the results reported in column (6) remains robust to this change in the sample. However, the magnitude of the effect of language gender dummies is smaller.

In summary, the data provide evidence that places with gender intensive languages have lower participation of women in the labour force. Next, I provide additional robustness checks to further confirm these findings.

Robustness checks. If linguistic structures shape cognition, other linguistic attributes beyond the gender systems could matter as well. If so, it is possible that the estimated effect of language gender systems is reflecting broader cognitive differences associated with different language structures, which may drive the labour market behaviour.

Linguistic gender systems are frequently, but not always, linked to biological sex. Just as with sex-based gender systems, non-sex based language gender systems group nouns according to the form of agreement they demand with other elements in the sentence. The difference with sex-based gender systems is that biological sex does not form the "semantic core" of these systems (Corbett, 2008b). For example, non-sex-based gender systems may be based on human/non-human distinctions (consequently, nouns denoting human males and human females are found in the same gender in these languages). Only 9 countries in the sample have such gender systems. In 6 of the corresponding languages sex is still reflected in the personal pronoun systems (e.g. Danish, Swedish). However, sex is not part of the semantic core behind agreement of nouns with verbs, adjectives, determiners, numerals, etc. One way to single out the effect of sex-based linguistic elements from other linguistic structures is therefore to control for these languages with similar but non-sex-based gender structures. Inclusion of a dummy for languages with non-sex-based gender systems in estimations leaves the results unaffected (second column of Table 4). The coefficient on the dummy itself is insignificant.

Obligatory future-time reference in languages has been shown to significantly affect future-oriented actions, including saving and health behaviours of their speakers (Chen, 2011). The suggested explanation is that being required to speak differently about future events leads speakers to treat the future as more distant, and to take fewer future-oriented actions. Intertemporal preference may have implications for labour market behaviour as well. Chen (2011) categorises the future-time reference of a language as "strong" if it requires the use of the future tense when speaking about future events, and "weak" otherwise. Inclusion of this term in the estimations is an attempt to isolate the effect of linguistic gender systems, assuming that the two grammatical features may be potentially related.[6] The results are reported in the third column of Table 4. The estimated coefficients on language gender

[6] The data comes from Chen (2011). Missing values for 12 languages in the sample are filled based on various web-based linguistic sources.

dummies largely preserve their size and significance. The coefficient on future time-reference dummy is insignificant.

An additional source of concern in interpreting the results is the varying degree of prevalence of language gender systems in different parts of the world. For example, many of the countries where strongly-gendered languages are spoken are situated close to the southern Mediterranean shore. As a result, the effect of certain correlated spatial factors may be attributed to language gender systems. To address this concern, distance from the equator measured as the absolute value of latitude in degrees divided by ninety, is added as a control. As the results reported in the fourth column of Table 4 demonstrate, its coefficient is positive and significant. However, its inclusion does not affect the estimated coefficients on language gender dummies.

Previous studies have considered the distance from the equator as a poxy for geography (e.g. Rodrik *et al.*, 2004) as well as for Western European influence (Hall and Jones, 1999). Next, direct measures to capture both dimensions are considered. Climatic and location factors are added as controls for geography. The climatic factors are share of population in tropical climate zones and average number of frost days per unit of population, and the location factors are share of population within 100km of the coast or an ocean-navigable river and a dummy for country's landlocked status (Sources: Gallup *et al.*, 1999; Masters and McMillan, 2001). The results are reported in the fifth column of Table 4. Countries with larger shares of populations close to coastal areas have higher share of women in the labour force. The coefficients on language gender dummies remain robust to inclusion of these additional controls.

Hall and Jones (1999) claim that the distance from equator proxies for the Western European influence, since Western Europeans were more likely to settle in sparsely populated and climatically similar areas. The model is next augmented with more direct measures of Western European influence, including dummies for former British and French colonies, as well as dummies for English common law and French civil law traditions (La Porta *et al.*, 1998). As the results demonstrate, former French colonies have higher women's labour force participation rate (column 6 of Table 4). The coefficients on language gender dummies are not affected.

In spite of the robustness of the results to the inclusion of these additional controls, the possibility of unobserved differences other than language gender systems driving labour force participation of women cannot be completely ruled out. Importantly, there may be unobserved cultural elements correlated with the presence of linguistic gender systems as

well as women's labour force participation. Therefore, to consistently estimate the impact of language gender systems on women's labour force participation, a source of exogenous variation in language gender systems is needed. The grouping of languages into families is exploited here to identify the effect of language gender systems. Languages belonging to the same family typically share a common ancestor, a proto-language. Variations in sex-based gender in languages may be related to variations in proto-language structures which might have given rise to sex-based gender in descendant languages. At the same time, as discussed earlier, the pre-historic origins of language families, and the fact that they are often geographically rather dispersed is encouraging for the validity of this approach (i.e. exclusion restriction). 2SLS estimation is carried out, using dummies for eight language families as instruments. These are the language families that have more than one language represented in the sample.

The last column of Table 4 reports the results of 2SLS estimations. The coefficients on language gender dummies preserve their signs and statistical significance. Their magnitude is slightly larger as compared to OLS estimates. The instruments are jointly highly significant in the first stage, as demonstrated by F-statistics reported in the bottom part of the Table. An overidentification test to detect whether the instruments have a direct effect on women's labour force participation is also carried out. As shown in the Table, the p-value indicates no evidence for a direct effect.

3.2 Individual level estimates

Table 5 presents the results of the individual level analysis of language gender systems and labour market outcomes, based on the World Values Surveys. First, I consider models where the dependent variable is the full-time employment status of the respondent. Consistent with country level estimates, the coefficients on language gender dummies estimated based on the women's sample have negative signs. However, only the coefficient on the mildly gendered language dummy is statistically significant. The difference in employment probabilities of women who speak a mildly gendered language from that of women who speak a gender-neutral language is 0.1 percentage points. According to the results, Muslim and Hindu women are less likely to be employed as compared to women who do not belong to any religious denomination. Other demographic characteristics that have a statistically significant effect on women's employment probability are age, marital status, number of children, health and education status. They have by and large the expected signs.

The hypothesis about the effect of linguistic gender systems predicts a negative effect only on the employment of women, but not that of men. However, no difference across sexes of the effect of gender systems in language would be expected, if they were capturing the effect of linguistic elements, other than sex-based gender systems, with broad effects on cognition. The estimates of language gender dummies on men's probability of employment are insignificant. Many of the standard demographic characteristics have explanatory power over men's employment status as well.

In a next step, I consider the intensive margin, involving part-time employment status as a dependent variable. The coefficients on language gender dummies estimated based on the women's sample have positive signs. Again, only the coefficient on the mildly gendered language dummy is statistically significant. Employment of women who speak a mildly gendered language is around 0.08 percentage points more likely to be on a part-time basis as compared to employment of women who speak a gender-neutral language. No effect of language gender dummies on men's part-time employment status is found. Interestingly, in this case there is a significant positive coefficient on the dummy, indicating that the interview language is of lower gender intensity than the language spoken at home by the respondent. The regressions also include a dummy that equals one, if the interview is conducted in the language used at home by the respondent. Therefore, one way to interpret that coefficient is to suggest that the probability of being employed part-time increases with a decrease in gender intensity of a language spoken by a man.

The World Values Surveys allow us to consider the attitudes on gender roles, in addition to labour market participation. The dependent variable considered here reflects the differences in individuals' beliefs about whether women should have equal access to jobs, which is likely to affect the observed differences in female labour force participation. The results reported in the last column of Table 5 demonstrate a positive and highly significant effect of gendered languages on the probability of having gender discriminatory attitudes. Speakers of both mildly and strongly gendered languages are more likely to support men's privileged rights for jobs as compared to speakers of gender-neutral languages.

As expected, women are less likely to have gender discriminatory attitudes. The gender of the interview language matters as well, and in the same direction as the gender of the home language. The probability of expressing gender discriminatory attitudes decreases with the decrease in gender intensity of the language in which the interview was conducted. The significance of this effect is consistent with recent studies in social psychology, which have demonstrated that the language used to elicit particular attitudes affects the content of

these attitudes (Danziger and Ward, 2010; Ogunnaike *et al.*, 2010). Representatives of certain religious denominations are more likely to have discriminatory attitudes than those not belonging to religious denominations. Older and married people, as well as those with more children are more likely to support women's unequal access to jobs, as are less educated people.

Linguistic gender systems could be associated with traditional gender role attitudes among women as well as men. As a result, women will work less due to loss of their own gender identity. Likewise, women's employment will be negatively affected by its threat on men's gender identity. Interaction terms of sex and language gender dummies, when included in the regressions, are insignificant, and do not affect the coefficients on language gender dummies.[7] If the belief-based variable in question forms the foundation of women's objective outcomes, it is reasonable to conclude that linguistic features affect women's employment because of losses in gender identity of both women and men.

4. CONCLUSION

Economic development alone has proved insufficient for considerable progress in important dimensions of women's empowerment. A deeper explanation of women's deprivation will therefore have to include, besides economic factors, also social and cultural ones (Sen, 1990). A large and influential corpus of feminist literature has emphasized the role of sex-based gender systems in languages in disadvantaging women. This article represents the first attempt to test the empirical plausibility of that claim in the context of labour market outcomes of women.

Using a country-level dataset of 108 countries in the year 2000, I showed that places where the majority language is gender-intensive have lower participation rates of women in the labour force. A number of robustness checks were completed to confirm this result. Using individual level data from up to 48 countries in the World Values Surveys, the article documented an effect of gender-intensive languages on women's employment probability. Furthermore, it explored a belief-based variable behind women's objective outcomes. The individual-level results suggested that speakers of gender-intensive languages are more likely to hold the view that women should not have equal access to jobs.

These results support the propositions that gendered languages have an adverse effect

[7] Results are available on request.

on gender equality. Moreover, they suggest that existing gender stereotypes and gaps in labour market outcomes will not go away any time soon, even if opportunities become equal for women and men. The results thereby furnish support for initiatives to make languages more gender-neutral on grounds of efficiency.

Admittedly, more work needs to be done in order to obtain better estimates. In particular, the possibility of linguistic gender systems picking up the effect of deeper gender-biased cultural elements is hard to rule out completely in the current setting. Intra-language comparisons are a promising path to single out the effect of language gender systems from other confounding factors. Use of gender-neutral language has been promoted in many places. In the context of labour market, for example, practices of job advertisements written explicitly to be inclusive of both sexes (e.g. through the use of "/" to include terms and parts of speech applicable to each gender) have become increasingly common. Whether similar practices have an effect on women's labour supply is yet to be explored. Experimental work holds promises in this research area.

If linguistic structures shape our thoughts, then other grammatical features beyond gender systems may matter as well. There is a rich heterogeneity across different languages which has remained almost completely overlooked by economists. Furthermore, studies in social psychology and linguistics provide important insights on the cognitive effects of different language systems. These results can potentially be redirected towards explaining aspects of the preferences, beliefs and values that matter for economic outcomes. Studies by Alesina and Giuliano (2007), Licht *et al.* (2007) and Chen (2011) make first steps in this direction. Identification of other linguistic factors that are of importance for economic outcomes is a promising direction of future research.

Table 1 Data on language gender and female labour force participation across countries

Country	Majority lang	Lang gender	Female participation	Country	Majority lang	Lang gender	Female participation
Albania	Albanian	1	41.27	Libya	Arabic	2	23.37
Algeria	Arabic	2	27.58	Lithuania	Lithuanian	1	48.07
Argentina	Spanish	2	33.26	Madagascar	Malagasy	0	44.50
Armenia	Armenian	0	49.02	Malawi	Chichewa	0	49.04
Australia	English	1	43.85	Malaysia	Malay	0	37.63
Austria	German	1	41.35	Mali	Bambara	0	46.14
Azerbaijan	Azerbaijani	0	44.58	Mauritania	Arabic	2	43.93
Bahrain	Arabic	2	21.65	Mexico	Spanish	2	33.79
Bangladesh	Bengali	0	42.93	Mongolia	Khalkha	0	47.55
Belarus	Belarusian	1	49.13	Morocco	Arabic	2	34.74
Belgium	Dutch	1	40.98	Nepal	Nepali	0	39.37
Bolivia	Spanish	2	37.78	Netherlands	Dutch	1	40.70
Brazil	Portuguese	1	35.47	New Zealand	English	1	45.79
Bulgaria	Bulgarian	1	48	Nicaragua	Spanish	2	36.20
Cambodia	Khmer	0	52.33	Niger	Hausa	2	43.23
Canada	English	1	45.92	Nigeria	Yoruba	0	36.27
Chile	Spanish	2	33.61	Norway	Norwegian	1	46.61
China	Mandarin	1	45.13	Oman	Arabic	2	17.21
Colombia	Spanish	2	39.05	Pakistan	Punjabi	0	28.85
Congo	Kongo	1	43.11	Panama	Spanish	2	35.32

Costa Rica	Spanish	2	31.53	Philippines	Tagalog	0	37.91
Croatia	Croatian	1	44.44	Poland	Polish	1	46.44
Cuba	Spanish	2	39.57	Portugal	Portuguese	1	43.98
Czech Rep	Czech	1	47.16	Rep of Korea	Korean	1	41.37
Denmark	Danish	1	46.65	Rep of Moldova	Romanian	1	48.92
Dominican Rep	Spanish	2	30.82	Romania	Romanian	1	44.74
Ecuador	Spanish	2	28.04	Russian Fed	Russian	1	49.15
Egypt	Arabic	2	30.48	Saudi Arabia	Arabic	2	17.74
El Salvador	Spanish	2	36.33	Senegal	Wolof	0	43.15
Eritrea	Tigrinya	2	47.44	Slovakia	Slovak	1	47.77
Estonia	Estonian	0	49.51	Slovenia	Slovene	1	46.40
Ethiopia	Oromo	1	41.39	South Africa	Zulu	1	38.48
Finland	Finnish	0	48.09	Spain	Spanish	2	37.40
France	French	1	45.26	Sri Lanka	Sinhala	1	35.45
Georgia	Georgian	0	46.84	Sudan	Arabic	2	29.49
Greece	Greek	1	37.77	Sweden	Swedish	1	47.96
Guatemala	Spanish	2	29.12	Switzerland	German	1	40.35
Guinea	Fula	0	47.16	Syria	Arabic	2	26.94
Guyana	English	1	35.17	Tajikistan	Tajik	0	44.94
Honduras	Spanish	2	31.91	Thailand	Thai	0	47.11
Hungary	Hungarian	0	44.54	FYR Macedonia	Macedonian	1	42.19
India	Hindi	0	32.30	Togo	Ewe	0	39.98
Iran	Persian	0	26.97	Tunisia	Arabic	2	31.94

Ireland	English	1	35.02	Turkey	Turkish	0	38.16
Israel	Hebrew	2	41.44	Turkmenistan	Turkmen	0	45.96
Italy	Italian	1	38.61	Ukraine	Ukrainian	1	48.88
Jamaica	English	1	47.49	United Kingdom	English	1	43.83
Japan	Japanese	1	41.49	United States	English	1	46.39
Jordan	Arabic	2	23.87	Uruguay	Spanish	2	42.01
Kazakhstan	Kazakh	0	47.26	Uzbekistan	Uzbek	0	46.87
Kuwait	Arabic	2	21.48	Venezuela	Spanish	2	34.81
Kyrgyzstan	Kyrgyz	0	47.37	Viet Nam	Vietnamese	0	48.74
Laos	Lao	0	46.73	Yemen	Arabic	2	28.62
Latvia	Latvian	1	49.72	Zimbabwe	Shona	0	44.24

Table 2 Country level descriptive statistics

Variable	Source	Mean	Std. dev.	Min	Max
Female participation	Ross (2008)	40.11	7.86	17.21	52.33
Lang gender1	Siewierska (2008)	0.39	0.49	0	1
Lang gender2	Siewierska (2008)	0.31	0.47	0	1
Ling major sh	Alesina *et al.* (2003)	77.26	21.33	21.35	100
Ln income	Heston *et al.* (2006)	8.67	1.08	6.24	10.44
Gov size	Heston *et al.* (2006)	22.30	10.24	3.79	71.05
Openness	Rose and Spiegel (2009)	83.85	40.36	20.18	228.88
Oil rents	Ross (2008)	361.73	1182.33	0	9960.77
Democracy	Rose and Spiegel (2009)	5.87	3.89	0	10
Ln population	Heston *et al.* (2006)	16.42	1.41	13.36	20.96
Urban sh	UNESCO (2007); United Nations (2007)	57.31	21.29	13.70	97.10
Protestant sh	Barro (2007)	9.30	17.79	0	89.70
Catholic sh	Barro (2007)	27.92	34.96	0	94.30
Muslim sh	Barro (2007)	26.35	37.20	0	99.10
Jewish sh	Barro (2007)	0.87	7.41	0	77.10
Hindu sh	Barro (2007)	2.29	10.92	0	77.10
Buddhist sh	Barro (2007)	4.35	15.61	0	85.30
Communist	Barro (2007)	0.31	0.47	0	1

The list of countries in the sample is provided in Table 1.

Table 3 Country level OLS estimates on different samples

	(1)	(2)	(3)	(4)	(5)	(6)
Lang gender 1	-2.324*	-2.4711**	-3.1219**	-3.9085**	-2.1724**	-1.7916*
	(1.2088)	(1.2023)	(1.4077)	(1.8194)	(1.0472)	(1.0702)
Lang gender 2	-4.386***	-4.2659**	-4.5593***	-5.1323**	-2.8991*	-3.2504**
	(1.6687)	(2.0244)	(1.6815)	(2.0292)	(1.5144)	(1.5847)
Ling major sh	0.0447*	0.0475*	0.0518**	0.0561**	0.0446**	0.0361*
	(0.024)	(0.0242)	(0.0247)	(0.0278)	(0.0209)	(0.0212)
Ln income	-7.2374	-11.7376	-7.0285	-5.7639	-7.9186	-0.3432
	(9.1217)	(8.8955)	(9.2059)	(10.8771)	(7.8876)	(9.5193)
Ln income sq	0.4018	0.6769	0.4043	0.3171	0.4438	-0.0393
	(0.5495)	(0.5383)	(0.5545)	(0.6446)	(0.4752)	(0.5706)
Gov size	0.0064	0.0321	0.0132	0.0282	-0.0179	-0.0549
	(0.0478)	(0.0522)	(0.0484)	(0.0563)	(0.0414)	(0.0474)
Openness	-0.0056	-0.009	-0.0017	-0.0048	-0.0107	-0.0079
	(0.0122)	(0.0116)	(0.0127)	(0.015)	(0.0104)	(0.011)
Oil rents	-0.001**	0.0002	-0.0011**	-0.001**	-0.002***	-0.0018***
	(0.0005)	(0.0011)	(0.0005)	(0.0005)	(0.0006)	(0.0006)
Democracy	0.2846	0.2293	0.321*	0.3724	0.1573	0.131
	(0.1801)	(0.1815)	(0.1827)	(0.2314)	(0.1604)	(0.1565)
Ln population	-0.0704	-0.2894	0.0275	-0.1185	-0.0512	0.0867
	(0.3775)	(0.3759)	(0.3856)	(0.4575)	(0.3236)	(0.3427)
Urban sh	0.0188	0.0344	0.0153	0.0277	0.0278	0.0277
	(0.0369)	(0.0389)	(0.0375)	(0.0429)	(0.0317)	(0.0335)
Protestant sh	0.0102	-0.0057	0.0219	0.0065	0.0125	0.0493
	(0.0326)	(0.0328)	(0.0354)	(0.0367)	(0.0307)	(0.031)
Catholic sh	-0.0524**	-0.0519***	-0.0495**	-0.0569**	-0.05***	-0.0302
	(0.0204)	(0.019)	(0.0209)	(0.0234)	(0.019)	(0.0193)
Muslim sh	-0.0242	-0.0332	-0.0258	-0.0279	-0.01	-0.0011
	(0.0227)	(0.0227)	(0.0233)	(0.0287)	(0.0202)	(0.0206)
Jewish sh	0.1275**	0.0952	0.121*	0.1164	0.1471***	2.2441*
	(0.0613)	(0.0668)	(0.0625)	(0.0704)	(0.0521)	(1.1724)
Hindu sh	-0.0721	-0.0666	-0.0708	-0.0792	-0.0701*	-0.0218
	(0.0467)	(0.0461)	(0.0471)	(0.0517)	(0.0413)	(0.1227)
Buddhist sh	0.0483	0.0449	0.0481	0.0342	0.038	0.0674
	(0.0395)	(0.0379)	(0.0399)	(0.0511)	(0.0347)	(0.0474)

Communist	4.5345***	3.7585**	4.8114***	4.7505**	4.0994***	3.6608**
	(1.7203)	(1.6829)	(1.7398)	(2.0322)	(1.4682)	(1.4538)
Constant	73.4557*	94.8962**	69.1913*	67.2725	77.4486**	46.5481
	(39.9276)	(39.1604)	(40.3794)	(47.9862)	(34.3566)	(40.9463)
Region effects	Yes	Yes	Yes	Yes	Yes	Yes
No of obs	108	94	105	94	102	94
R-sq	0.8219	0.7438	0.8219	0.8082	0.8695	0.8937

(1) full sample; (2) excludes Arabic-speaking countries; (3) excludes Estonia, Finland and Hungary; (4) excludes formerly-Communist countries speaking gender-neutral languages; (5) removes influential observations based on studentised residuals; (6) removes influential observations based on Cook's distance; * denotes significance at 10 percent level, ** at 5 percent level, *** at 1 percent level.

Table 4 Country level robustness checks

	OLS	OLS	OLS	OLS	OLS	2SLS
Lang gender 1	-2.387*	-2.3621*	-2.1616*	-2.4959*	-2.3116*	-2.5429*
	(1.2062)	(1.2134)	(1.1951)	(1.2776)	(1.194)	(1.4505)
Lang gender 2	-4.1857**	-4.4754***	-4.7068***	-4.8245***	-4.5094***	-5.0745**
	(1.6714)	(1.6779)	(1.6544)	(1.7484)	(1.6311)	(2.0587)
Non-sex-based	2.043					
gender	(1.6558)					
Future time-ref		0.8312				
		(1.1439)				
Dist from equator			8.6254*			
			(4.6743)			
Tropical pop sh				0.0022		
				(0.0188)		
Avg num frost days				0.1148		
				(0.0982)		
Pop sh 100 km coast				0.037**		
				(0.0181)		
Landlocked				1.7039		
				(1.2609)		
British colony					-0.4885	
					(1.5336)	
French colony					3.3704**	
					(1.5279)	
English common law					-0.2748	
					(2.1252)	
French civil law					0.0354	
					(2.0871)	
Ling major sh	0.0469*	0.0437*	0.0422*	0.0384	0.039	0.0461**
	(0.024)	(0.0241)	(0.0237)	(0.0251)	(0.0241)	(0.0213)
Ln income	-9.4538	-7.5249	-5.7479	-3.7416	-7.0145	-7.923
	(9.2692)	(9.156)	(9.03)	(9.6918)	(9.1572)	(8.2136)
Ln income sq	0.5282	0.4228	0.2951	0.1627	0.4225	0.4438
	(0.5573)	(0.5518)	(0.5449)	(0.5887)	(0.5535)	(0.4927)
Gov size	0.012	0.0038	0.0095	0.0131	0.0391	0.0113
	(0.0479)	(0.0481)	(0.0472)	(0.0509)	(0.0504)	(0.0428)

Openness	-0.0065	-0.0035	-0.0026	-0.0092	-0.0058	-0.0065
	(0.0122)	(0.0126)	(0.0122)	(0.0142)	(0.0124)	(0.0111)
Oil rents	-0.001**	-0.001**	-0.0009*	-0.0009*	-0.0008*	-0.001***
	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0004)
Democracy	0.3212*	0.2797	0.2002	0.1607	0.3393*	0.2697
	(0.182)	(0.1807)	(0.1834)	(0.1926)	(0.1862)	(0.1689)
Ln population	-0.0406	-0.0442	-0.0651	-0.0235	0.0569	-0.092
	(0.3771)	(0.3802)	(0.3722)	(0.4017)	(0.3764)	(0.3452)
Urban sh	0.0172	0.0178	0.0131	0.0368	0.0034	0.021
	(0.0368)	(0.0371)	(0.0365)	(0.0392)	(0.0366)	(0.0336)
Protestant sh	0.0017	0.0162	0.0028	0.0077	0.0068	0.008
	(0.0332)	(0.0338)	(0.0324)	(0.0337)	(0.0353)	(0.029)
Catholic sh	-0.0545***	-0.053**	-0.0441**	-0.0474**	-0.0595***	-0.0507***
	(0.0204)	(0.0204)	(0.0206)	(0.0212)	(0.0205)	(0.0193)
Muslim sh	-0.0213	-0.0238	-0.0216	-0.0156	-0.0317	-0.0245
	(0.0228)	(0.0228)	(0.0224)	(0.0234)	(0.0225)	(0.0215)
Jewish sh	0.1269**	0.1266**	0.1479**	0.1463**	0.1336**	0.1282**
	(0.0611)	(0.0615)	(0.0615)	(0.0666)	(0.0628)	(0.0562)
Hindu sh	-0.0756	-0.0752	-0.0657	-0.0382	-0.0799	-0.0731*
	(0.0467)	(0.047)	(0.0462)	(0.0518)	(0.0492)	(0.0414)
Buddhist sh	0.0462	0.048	0.0652	0.0758*	0.0202	0.0481
	(0.0394)	(0.0396)	(0.04)	(0.0432)	(0.0412)	(0.035)
Communist	4.4739**	4.7659***	4.0031**	3.9636**	4.0054**	4.46***
	(1.7157)	(1.7543)	(1.7204)	(1.7623)	(1.8)	(1.5378)
Constant	82.4179**	73.0247*	64.8197	55.7456	68.8101*	76.5693**
	(40.4613)	(40.0446)	(39.6452)	(42.9631)	(40.0744)	(36.2743)
Region effects	Yes	Yes	Yes	Yes	Yes	Yes
No of obs	108	108	108	106	108	108
R-sq	0.8251	0.8230	0.8289	0.8242	0.8386	0.8215
F-stat for excluded instruments						8.69; 7.84
Overidentification test p-value (χ-sq)						0.37

* denotes significance at 10 percent level; ** at 5 percent level; *** at 1 percent level.

Table 5 Individual level probit estimates

	Full-time employment		Part-time employment		Discrim attitudes
	Women	Men	Women	Men	
Lang gender 1	-0.1022*	0.011	0.0766**	0.0289	0.0953***
	(0.0615)	(0.0134)	(0.0355)	(0.019)	(0.0341)
Lang gender 2	-0.1692	0.0156	0.0428	-0.0109	0.1263***
	(0.1404)	(0.0166)	(0.0699)	(0.0136)	(0.0461)
Woman					-0.1479***
					(0.0159)
Int lang same	0.0476	0.0176	-0.0206	0.0022	-0.0644***
	(0.0473)	(0.0201)	(0.0331)	(0.009)	(0.0248)
Int lang less gender	0.0834	0.0162	-0.0272	0.0417*	-0.1046**
	(0.0962)	(0.0235)	(0.0586)	(0.0217)	(0.0518)
Protestant	-0.0016	0.01	0.0336**	-0.0021	0.0641***
	(0.0337)	(0.0122)	(0.0152)	(0.0132)	(0.0174)
Catholic	-0.0149	-0.0065	0.0238*	-0.0064	0.0401**
	(0.026)	(0.0095)	(0.0136)	(0.0103)	(0.0166)
Muslim	-0.1341***	-0.0087	0.0619**	0.0285*	0.1212***
	(0.0341)	(0.0117)	(0.0285)	(0.0164)	(0.0203)
Jewish	-0.0334	-0.0266	-0.023	0.0127	0.0166
	(0.0671)	(0.0323)	(0.0391)	(0.0403)	(0.0613)
Hindu	-0.1256***	0.0028	-0.0027	-0.0067	0.1168**
	(0.0449)	(0.0166)	(0.0374)	(0.0165)	(0.0483)
Buddhist	0.0136	-0.0142	-0.0484	0.0099	0.0038
	(0.0295)	(0.0239)	(0.0352)	(0.0242)	(0.0191)
Other relig	0.0334	0.015	0.0165	-0.0056	0.0217
	(0.0245)	(0.0097)	(0.0225)	(0.0112)	(0.0176)
Age	0.0022**	0.001**	-0.0009**	-0.0008**	0.0019***
	(0.0011)	(0.0005)	(0.0004)	(0.0003)	(0.0005)
Married	-0.0925***	0.1429***	-0.0224	-0.054***	0.0326**
	(0.0295)	(0.0138)	(0.0151)	(0.0092)	(0.0128)
Divorced	0.0726***	0.0458***	-0.0557***	-0.025***	-0.0167
	(0.0274)	(0.0068)	(0.0179)	(0.0095)	(0.0161)
No children	-0.028***	-0.0028	0.0097*	-0.0001	0.0075***
	(0.0056)	(0.0018)	(0.0058)	(0.0027)	(0.0026)
White	-0.0272	0.0068	-0.0187	-0.0108	0.0058

	(0.0393)	(0.0109)	(0.0197)	(0.0087)	(0.024)
Good health	0.0145	0.0168***	-0.0038	-0.0011	-0.0156
	(0.0117)	(0.0064)	(0.0119)	(0.006)	(0.0118)
Poor health	-0.0944***	-0.0372***	-0.006	0.0296**	0.0008
	(0.0209)	(0.0138)	(0.028)	(0.012)	(0.0191)
Educ lower	-0.3537***	-0.0644***	-0.0294	-0.0111	0.1857***
	(0.0312)	(0.0118)	(0.0206)	(0.0113)	(0.0128)
Educ middle	-0.2189***	-0.0518***	-0.0255**	-0.0155**	0.1005***
	(0.0241)	(0.0078)	(0.0116)	(0.0077)	(0.0101)
Income dummies	Yes	Yes	Yes	Yes	Yes
Town size dummies	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
No of obs	22202	20397	11263	17748	42439
No of countries	47	48	46	47	48
Pseudo R-sq	0.2341	0.1727	0.0797	0.0682	0.2766
Log pseudo-likelihood	-11784.05	-6512.49	-5129.51	-5198.04	-21229.35

Standard errors are clustered at the country level; Marginal effects calculated at the means are reported; * denotes significance at 10 percent level, ** at 5 percent level, *** at 1 percent level.

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