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RESEARCH NOTE

Linguistic gender marking and its international business ramifications

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Abstract
We analyze the impact of language-based gender distinctions within languages' grammatical structures on women's corporate presence. Using four different data sets, we find that countries where the dominant language marks gender more intensely have significantly lower female participation on boards of directors and in senior management, as well as smaller female-led corporate teams. We also find that the gender marking of the language used in the headquarters' home country impacts female presence on the subsidiary boards of multinational companies, independently of gender marking in the language of the host country. Our findings suggest that linguistic gender marking offers a superior alternative to the commonly used aggregate values-based measures of culture, and that its research usage should be expanded accordingly. Underpinning this proposed expansion is the very stable nature of language-based gender distinctions, which are inherited from the distant past, and the direct influence of language on cognition via the shaping of the mental representation of social reality. The findings also reinforce the need to view language design as a vital strategic, as well as operational, tool for multinational companies.
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Keywords: language; gender marking; culture; logistic regression; grammatical structure

INTRODUCTION

Darwin (1859) considered language a form of memory that stores information in a genome-like mode. Grammar, according to cognitive science research (Boroditsky, Schmidt, & Phillips, 2003), impacts a speakers' cognitive framework and mental representation of social reality. Gender is among the most stable grammatical features (Wichmann & Holman, 2009), and comparing languages is valuable for understanding their social role (Corbett, 2011). Such research should have significant value for international business (IB), where national variations are of focal interest but where the study of linguistics has mostly been relegated to a subset of culture. Culture-based research currently relies on aggregate values-based measures of culture (e.g., Hofstede, 1980, 1998; Hofstede, Hofstede, & Minkov, 2010; House, Hanges, Javidan, Dorfman, & Gupta, 2004), making it susceptible to endogeneity problems, and contemporaneous to gender outcomes. In contrast, a language's grammatical structure is a stable feature inherited from the distant past, unbiased by present social, political and economic forces.

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LITERATURE AND HYPOTHESES

The Value-Belief Theory (Triandis, 1995) suggests that values and beliefs held by a culture's members influence behavior and its legitimacy (Barnouw, 1979; Freytag & Thurik, 2007); for instance, culture has been shown to influence economic behavior (Stevenson & Lundström, 2001; Mueller & Thomas, 2001). The study of gender is embedded in cultural research (Boserup, 1970; Fernandez, 2010).

To generativist linguists, languages are part of human biology, fundamentally equal in structure with only minor local differences (Chomsky, 1980), but a new scholarly stream considers languages to be as institutions that are part of a society's cultural heritage, therefore differing and evolving in complexity (Sampson, Gill, & Trudgill, 2009) together with culture, history and geography (Christiansen & Kirby, 2003; Evans & Levinson, 2009). Language is more than a transmission device because it shapes and influences thought (Whorf, 1956).

The imprint of inherited cultural values in a language's grammar is rooted in the impact of language on cognition, forcing speakers to encode selectively and shaping their mental representation of social reality, which yields outcomes that include attitudes towards saving and health-related behavior (Chen, 2013). A fundamental way in which societies vary is the extent to which they prescribe and proscribe different gender roles (Adams & Flynn, 2005; Burke & Mattis, 2000). Santacreu-Vasut, Shoham, and Gay (2013) show how language gender marking influences gender quotas in politics, while Givati and Troiano (2012) explore the impact of gender marking in pronouns on maternity leave laws. Linguistic expression of gender may capture values shown to produce persistent gender outcomes, for example, corporate board presence (Wright, Baxter, & Birkelund, 1995). Grosvold and Brammer (2011) find female board representation higher in cultures with low gender differentiation.

Female/male distinctions in a language are very stable features of grammar (Wichmann & Holman, 2009), which are inherited from the distant past. Linguistic research (Johansson, 2005) suggests that evolutionary pressures related to tool making, reproduction and the division of labor explain languages' origins. Language variations in gender marking may therefore reflect cultural variations in gender roles, which are reinforced by the cognitive impact of grammar on the speakers' representation of reality (Boroditsky et al., 2003). Thus:

Hypothesis 1: Female/male distinctions in a country's dominant language will have a negative effect on females' presence on corporate boards.

The literature suggests that females' labor market outcomes and professional advancement depend on family obligations that reduce human capital investment and limit career progress (Miller, 2011). Hofstede (1980) expects cultures with high femininity ratings to produce higher ratios of female executives. Emrich, Denmark, and Den Hartog (2004) claim that societies with high scores on GLOBE's Gender Egalitarianism will have more females in authority positions. Where gender differentiation is low, females are likely to assume senior posts (Javidan & House, 2001). Moore and Shackman (1996) found that culture impacts women in managerial positions. The size of the teams a manager leads is a key expression of managerial level (Lambert, Larcker, & Weigelt, 1991). Thus:

Hypothesis 2: Female/male distinctions in a country's dominant language will have a negative effect on the size of female-managed teams.

As a formal way to control and coordinate processes, language has a major impact on the MNE (Welch, Welch, & Piekkari, 2005). Luo and Shenkar (2006) view the MNE as a multilingual community with a strong impact of the HQ (headquarter) language. Language also has an impact on HQ-subsidiary relations (Gupta, 1987; Tenzer, Pudelko, & Harzing, 2014) and language diversity can highlight differences between locations in an MNE (Hinds, Neeley, & Cramton, 2014). Wu, Lawler, and Yi (2008) claim that an MNE home-country's cultural attitude concerning female roles has a strong impact on the use of criteria that discriminate against women in a subsidiary. Brock, Shenkar, Shoham, and Siscovick (2008) show a relationship between hierarchical preferences in a HQ's home culture and its probability of assigning expatriates to subsidiaries; we expect a similar impact of HQ home country gender marking on female representation at the subsidiary level, independent of the gender marking host country. Thus:

Hypothesis 3: Female/male distinctions in a dominant language of an MNE's home country will have a negative effect on females' presence on a subsidiary's boards.

METHOD

To measure the presence and intensity of female/male distinctions we use the four grammatical structure variables explicitly related to gender in the World Atlas

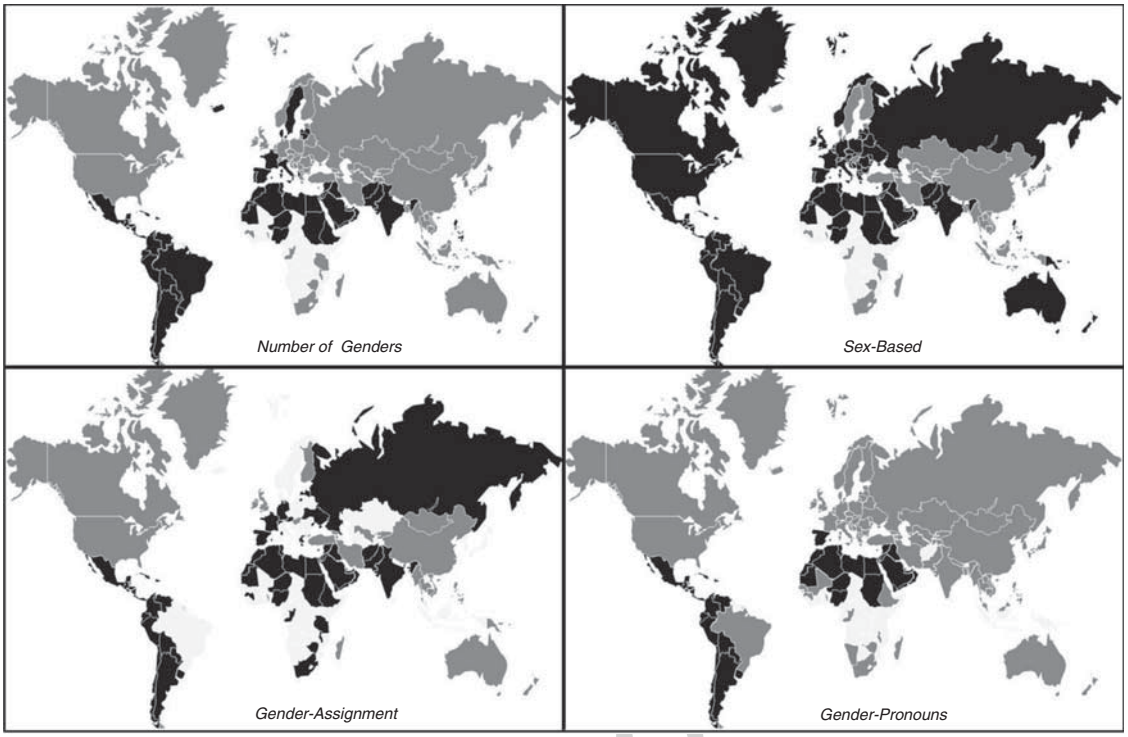

Figure 1 Intensity indices.
Note: Black countries Dummy = 1.

of Linguistic Structures (WALS; Dryer & Haspelmath, 2011). Following Encyclopedia Britannica (2010), we define the dominant language of a country as the one with the highest percentage of speakers. A language's gender system may or may not be linked to biological sex; for example, Danish and Swedish make distinctions that are not. This leads us to build the Sex-Based Intensity Index (SBII), a dummy variable = 1 for languages with a sex-based gender system.

Gender systems can and do vary in the number of types of nouns that have different agreements (how many different genders exist). While French has two genders "feminine/masculine," English includes "neuter" as a third. Other languages with multiple genders lack sex-related distinctions. We hence build a Number Gender Intensity Index (NGII), a dummy variable = 1 for two-gender languages.

A gender assignment system provides a set of rules to help speakers connect between nouns and defined genders. Assignment may or may not depend exclusively on the meaning of the noun (semantic assignment). For example, "table" is neuter in English since the language assigns gender only on semantic grounds. However, it is feminine in French which assigns gender to nouns that do not have a biological gender. To capture these differences, we build the Gender Assignment Intensity Index (GAII), a dummy variable = 1 for languages whose gender assignment system is both semantic and formal.

Finally, languages differ in the extent to which they distinguish gender in pronouns, for example, in English the pronominal system uses a sex-based gender system with three singular pronouns, "she," "he" and "it." Some languages have a sex-based gender system but lack sex-based pronouns. Hence, we build the Gender Pronouns Intensity Index (GPII), a dummy variable = 1 for languages with gender distinction in third, first and/or second person pronouns.

The maps in Figure 1 show the intensity indices distribution for each country's dominant language.

The four variables reflect different features of grammatical gender and capture different aspects of the usage intensity of male/female distinction. We form an aggregate index for each language as the sum of its individual indices. Our Gender Intensity Index (GII) is calculated as GII = NGII + SBII + GAII +GPII where GII $\in${0;1;2;3;4}.

For English, GII = 1 because the grammatical system of gender does depend on female/male distinctions (SBII = 1). It has three genders (NGII = 0), assigns gender only to nouns with an actual

Table 1 Data set extract

Country	Language	NGII	SBII	GAII	GPII	GII	GII_{v1}	GII_{v2}
Argentina	Spanish	1	1	1	1	4	3	3
Armenia	Armenian	0	0	0	0	0	0	0
Australia	English	0	1	0	0	1	1	1
Austria	German	0	1	1	0	2	2	1
Azerbaijan	Azerbaijani	0	0	n/a	0	n/a	n/a	0

Table 2 Correlation matrix

	NGII	SBII	GAII	GPII	GII	GII_{v1}	GII_{v2}	GEASIS
SBII	0.50***							
GAII	0.64***	0.54***						
GPII	0.76***	0.42***	0.59***					
GII	0.91***	0.78***	0.82***	0.86***				
GII_{v1}	0.89***	0.83***	0.84***	0.74***	0.97***			
GII_{v2}	0.90***	0.75***	0.68***	0.86****	0.97***	0.93***		
GEASIS	−0.05***	0.16***	−0.04***	−0.09***	0.01***	0.02***	0.005	
MAS	−0.14***	0.06***	0.04***	−0.04***	−0.05***	0.002	−0.07***	0.09***

***p-value < 0.01.

biological gender (GAII = 0) and distinguishes gender only in third person singular pronouns (GPII = 0).

We construct two additional aggregate sub-indices, GII_{v1} and GII_{v2}, as follows:

$$GII_{v1} = NGII + SBII + GAII \text{ and } GII_{v2} = NGII + SBII + GPII$$

GII_{v1} is a robustness check because information pertaining to its individual components comes from the same researcher, Corbett. GII_{v2} is built to overcome sample size limitations of our GII index since we lack information on *GAII* grammatical variable for many countries. Table 1 presents a data set extract that includes the seven indices.

We use four individual variables and three indices since (a) they contain different and complementary information; for example, only 34% of languages have SBII = 1 and GPII = 1; and (b) because using different variables allows a bigger sample and different samples, as robustness checks.

Table 2 shows the correlation between our seven indices is positive but imperfect, confirming that languages vary in gender marking intensity for different grammatical features, justifying index construction. Also noticeable is a very high correlation between GII and GII_{v1}, GII_{v2}, which was built as robustness check. The correlation between the grammatical gender structure variables and Hofstede/GLOBE scores is very low, which may be a result of endogeneity in the latter.

Table 3 shows intensity indices across linguistic families and within the Indo-European subfamily. N^C denotes the number of countries for which the dominant language belongs to the family and N^L denotes the number of different languages in the family. Linguistic structures are shown to vary widely across and within families. Thus, grammatical gender structures capture more than geographical or historical forces.

FINDINGS

Female Board Presence

To test for female presence on the boards of large, globally exposed firms, we analyze two data sets collected in different years for different firms. The GMI 2012 Ratings of Women on Boards (http://library.constantcontact.com/download/get/file/1102561686275-86/GMIRatings_WOB_032012.pdf) has data on 4300 firms in 45 countries; our data includes 41 of those. The data covers 2009–2011, and we use an average of 3 years per country in our analysis. We use GII_{v2} because it allows us to maximize the sample size. Table 4 presents the mean percentage of females on boards and committees in countries with low gender marking in the dominant language, captured by $GII_{v2} = \{0, 1\}$ and in countries with high gender marking in the dominant language, captured by $GII_{v2} = \{2, 3\}$.

Table 3 Indices variation

	N^C	N^L	NGII	SBII	GAII	GPII
Family						
Indo-European	67	34	0.48	0.91	0.79	0.30
Afro-Asiatic	23	5	1	1	1	0.95
Niger-Congo	10	10	0	0	0.86	0
Altaic	7	7	0	0	0	0
Austronesian	7	7	0.2	0.2	0	0
Indo-European						
Romance	25	5	0.92	1	1	0.79
Germanic	16	7	0.13	0.88	0.36	0
Slavic	12	10	0	1	1	0
Iranian	3	3	0.33	0.33	0.5	0

Table 4 Percentage of females on boards

	$GII_{v2} = 0, 1$	$GII_{v2} = 2, 3$	*p*-value
Boards	11.32	7.29	0.036
At least 1	61.98	47.78	0.044
At least 3	11.80	6.21	0.097
Audit committee	12.51	6.74	0.019
Governance/nominating committee	10.73	6.40	0.041
Remuneration committee	0.42	0.35	0.392

As shown in Table 4, the average percentage of female presence on boards and committees is higher in countries with low gender marking than in those with high marking. In five of the six, the percentage is significant. We obtain similar results with data from the European Professional Women's Network Rankings of Board, Woman Monitor 2008 for female board presence in the top 300 European companies in 17 countries. In Europe, which is a relatively homogeneous, integrated institutional environment, gender marking linguistic variables exhibit significant, high correlations. This supports Hypothesis 1.

Size of Female Managed Teams

To test the likelihood of a female manager leading a large team when speaking a language with high gender marking, we use the last three waves of the World Value Survey (1994–2007) (http://www.worldvaluessurvey.org/). Our dependent variable is a dummy variable $=1(0)$ if a female manages a team larger (smaller) than 10 employees. Table 5 presents odd ratios of logit regressions; these ratios capture how often a female leads a large team. An odd ratio smaller (bigger) than 1 implies that a factor predicts a decrease (increase) in behavior likelihood.

On the basis of Miller (2011), we control for marital status, education, age and number of children. Following Sen (1999), we control for income. Robust standard errors are clustered at the country level to capture that females living in the same country may share unobservable elements. We also control for survey wave. We do robustness checks for distance from the equator (Hall & Jones, 1999) and control for Spanish/British colonization (Acemoglu, Johnson, & Robinson, 2001). Following Weber (1930), we control for religion, with unchanged results. We do not display coefficients of control variables to focus on gender grammatical variables.

Table 5 shows that the indices have coefficients that are significant and lower than 1, suggesting gender intensity lowers the probability that a female will manage a large team. We perform similar regressions using measures that capture gender role as defined by GLOBE (House et al., 2004) and Hofstede (1980). Gender egalitarianism (GEASIS), the degree to which an organization or a society minimizes gender role differences while promoting gender

Table 5 Logit regressions of management of large teams and language gender marking

	1	2	3	4	5	6	7	8	9	10	11	12	13
NGII		0.34*** (0.10)											
SBII			0.71 (0.30)										
GPII				0.28*** (0.08)									
GAII					0.33*** (0.07)								
GII						0.66*** (0.05)					0.60*** (0.04)	0.55*** (0.05)	0.54*** (0.07)
GII_{v1}							0.61*** (0.07)						
MAS									1.02** (0.01)		1.01 (0.01)		1.01 (0.01)
GEASIS										0.65 (0.32)		1.38 (0.50)	1.24 (0.86)
Observations	3512	3284	3284	3249	2170	2167	2170	3 243	2182	2170	1632	1716	1427
Pseudo R^2	0.036	0.068	0.042	0.063	0.098	0.101	0.097	0.064	0.084	0.043	0.130	0.124	0.132
χ^2	49	113	45	84	79	133	111	80	58	35	150	134	116

***p-value < 0.01, **p-value < 0.05.
Note: Robust SE clustered at country level are in parenthesis.

equality (Emrich et al., 2004), is inserted for comparison. We also analyze the impact of Hoftstede's Masculinity measure (MAS).

Column 1 shows the baseline regression using the set of controls. The R^2 increases the most when adding GII. MAS coefficient is significant, but equal to 1, which means that MAS does not correlate with a likelihood of managing a large team. The GEASIS is insignificant. Columns 11–13 show that once we include both GII and MAS or/and GEASIS, the latter becomes insignificant while GII remains significant and lower than 1. This strongly supports Hypothesis 2.

Females on MNE Boards

We study a sample of MNEs in the micro finance industry (MFI), using MIX Market data (www.mixmarket.org) to analyze a sample of MFI multinational companies (excluding NGOs) for 2010 (only year with data regarding female on boards). This allows us to investigate the impact of gender intensity of the language spoken in the HQ country on female presence on subsidiary boards, even after taking into account host country language gender intensity. We construct four dummy variables for the possible configurations of home-host language gender intensity: low–low (L–L), low–high (L–H), high–low (H–L) and high–high (H–H). L–L = 1 if the dominant languages spoken in both countries have a GIIv2 < 2. L–H = 1 if the host country language has GIIv2 < 2 and the home country GIIv2 > = 2. We construct H–L and H–H similarly. This allows us to analyze the impact of HQ language gender intensity while considering subsidiary's language. Table 6 shows regressions with female percentage on a subsidiary's board as a dependent variable.

Our control variables include MFI log size measure as the number of active borrowers, non-profit status dummy variable and whether the MFI is mature. Given the link with economic development (Rajan & Zingales, 1998), we control for *per capita* income and financial development. Results are robust to further control for colonization (Spanish/British), geography (distance from equator), religion and continent dummies.

Column 2 (3) shows that the impact of low (high) gender marking at HQ is always positive (negative) for female board presence in a subsidiary regardless of subsidiary language gender intensity, supporting Hypothesis 3. Further, Columns 4–11 show language markers outperforming GEASIS and MAS.

Table 6 OLS regressions of presence of female in subsidiary corporate boards

	1	2	3	4	5	6	7	8	9	10	11
L–L		0.17**				0.18***	0.18***	0.19**			
		(0.05)				(0.06)	(0.06)	(0.07)			
H–H			−0.15**						−0.15*	−0.18***	−0.19**
			(0.07)						(0.08)	(0.06)	(0.09)
L–H			−0.20***						−0.22***	−0.18***	−0.18**
			(0.04)						(0.07)	(0.05)	(0.08)
H–L		0.16**				0.17**	0.18**	0.18**			
		(0.06)				(0.08)	(0.06)	(0.07)			
GEASIS				−0.11		0.03		−0.026	0.05		−0.07
				(0.12)		(0.16)		(0.16)	(0.18)		(0.20)
MAS					0.003**		0.001	0.001		0.001	0.001
					(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Observations	97	76	76	85	93	68	73	66	68	73	66
R^2	0.06	0.15	0.15	0.05	0.10	0.13	0.20	0.18	0.14	0.20	0.18

***p-value < 0.01, **p-value < 0.05, *p-value < 0.1.
Note: Robust SE are presented in parenthesis.

CONCLUSION

This research note confirms that gender intensity in a language's grammar is associated with lower female presence on firms' boards, in MNE subsidiary boards and in leadership positions. The findings suggest that language is not merely a derivative of culture, and that it should be considered an IB variable in its own right. The findings have ramifications for theories in which culture plays a role, for example, internationalization, where linguistic differences are a singular component of "psychic distance" (Johanson & Vahlne, 1977), and transaction cost economics (Williamson, 1975), where language may be viewed as a special transaction barrier, uniquely positioned to impact inter-party communications and hence governance choices. Grammatical features of language have been shown here to be viable substitutes for aggregate values-based measures of culture, which should deflect criticism of national variation as based on "soft" measures or changeable over time, challenging the convergence thesis (Webber, 1969). Finally, on the practical side, rather than wait for the European Commission 2012 draft (mandating 40% of board seats to be filled by women) to be ratified, companies would do well to take action now, for instance, by offering gender-sensitivity training for executives hailing from high gender marking nations to host nations that are low on the measure.

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