




More Than Words: Do Gendered Linguistic Structures Widen the Gender Gap in Entrepreneurial Activity?

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Leveraging linguistic relativity theory which suggests that language systems structure thought and action, we investigate the relationship between gendered linguistic structures and the persistent gender gap in early-stage entrepreneurial activity. We use country-level data from 105 countries in 2001–2015 with 55 different languages, and incorporate 32 controls covering a broad range of factors previously associated with entrepreneurial activity. We find that in countries where the dominant language’s structure incorporates sex-based systems and gender-differentiated pronouns, there is a greater gender gap in entrepreneurial activity. Our results suggest that gendered linguistic structures reinforce gender stereotypes and discourage women’s entry into entrepreneurship.

Introduction

Despite considerable cross-national variation in entrepreneurial activity (Reynolds, 2010), there are limited theoretical explanations of the underlying sources and processes (Baker, Gedajlovic, & Lubatkin, 2005), particularly why women are less likely than men to be entrepreneurs (Hughes, Jennings, Brush, Carter, & Welter, 2012; Verheul, van Stel, & Thurik, 2006). Women’s lower propensity to engage in entrepreneurship is attributed to individual (e.g., fear of failure) and environmental (e.g., occupational segregation, gender equality) characteristics (Elam, 2008; Klyver, Nielsen, & Evald, 2013), with recent

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reviews calling for multi-country panel data research to investigate new theories and factors that might explain the gender gap (Ahl, 2006; Engelen, Heinemann, & Brettel, 2009; Jennings & Brush, 2013).

Institutional theory offers tremendous possibilities for entrepreneurship (Bruton, Ahlstrom, & Li, 2010) beyond the early cross-cultural focus (Hayton, George, & Zahra, 2002). One overlooked institutional factor is language (Terjesen, Hessels, & Li, 2016) as differences in labor market dynamics across nations and cultures may be attributable to linguistic structures (Gay, Hicks, Santacreu-Vasut, Shoham, 2015; Gumperz & Levinson, 1996; Santacreu-Vasut, Shenkar, & Shoham, 2014; Santacreu-Vasut, Shoham, & Gay, 2013) that are stable over time (Johansson, 2005). Language is particularly germane to entrepreneurship given prior evidence of cross-cultural variation in cognitive scripts associated with venture-creation decisions (Mitchell, Smith, Seawright, & Morse, 2000) that may reflect underlying linguistic structures.

Languages have systematically different grammatical resources, and train individuals, from childhood onward, to use specific forms of expression that guide conceptualization and thinking (Lucy, 1997). In this study, we investigate: do gendered linguistic structures widen the gender gap in entrepreneurial activity? We utilize linguistic relativity theory (Sapir, 1921; Whorf, 1956), which describes how the structures of language shape the thoughts of its speakers. We test our hypothesis on a sample of 105 countries representing 55 languages, using four distinct gendered linguistic structures: number of genders, sex-based systems, gender assignment, and gender-differentiated pronouns. Controlling for 32 factors previously identified as drivers of male and female entrepreneurial activity (Bosma, 2014; Klyver et al., 2013; Reynolds, 2010), we find that countries in which the dominant language's structure requires sex-based systems and gender-differentiated pronouns have significantly lower levels of female entrepreneurial activity relative to male entrepreneurial activity.

Theoretical Background

Linguistics is the scientific study of language form (i.e., grammar, structure), meaning (semantics), and context. Management research historically investigates language signs (e.g., Brannen, 2004) and metaphors (e.g., Nicholson & Anderson, 2005). The recent revival of research investigating outcomes of linguistic structure (e.g., Chen, 2013; Givati & Troiano, 2012; Santacreu-Vasut et al., 2013) has roots in ancient philosophy by Aristotle, contending that linguistic structures shape thought and action.

Linguistic relativity theory (Lucy, 1997; Sapir, 1921, 1951; Whorf, 1956) outlines how structural differences in language systems are reflected in nonlinguistic cognitive differences, and emphasizes the distinct role of language structure in coding individuals' experience and influencing speakers' thoughts. Linguistic relativity theory is consistent with institutional scholar Douglass North's (2005, p. 39) observation that "the fundamental building blocks of a culture begin with language whose categories and vocabulary reflect the cumulative experience of a society." Political, economic, and other cultural institutions change more frequently and are secondary to the linguistic regime. Recent reviews indicate that language is the mechanism through which individuals understand and make decisions (Boroditsky, 2010, 2011; Gumperz & Levinson, 1996). We explore gendered linguistic structures because gender is one of the most stable grammatical features of language (Wichmann & Holman, 2009) that generates and propagates gendered identities and patterns of social interaction, and might significantly widen the gender gap in entrepreneurship.

Gendered Linguistic Structures

Every language spoken in today's world makes some gender distinction (Prewitt-Freilino, Caswell, & Laakso, 2012; WALS, 2016). Four of the most common gendered linguistic structures are number of genders, sex-based systems, gender assignment, and gender-differentiated pronouns. *Number of genders* captures how many different genders exist in a language in terms of the number of nouns with different agreements. For instance, Spanish has two genders: feminine and masculine, while English also has a neuter gender, and Finnish has no genders. *Sex-based* describes whether a language gender system is linked to biological sex or not. Approximately three-fourths of the world's languages, including English, have a sex-based system; an example of a non-sex-based system is Finnish (Corbett, 2016). *Gender assignment* captures whether a language assigns both semantic and formal genders to nouns or not. In a semantic and formal assignment system like Spanish, masculine and feminine gender are assigned to neutral or inanimate objects, for example, "kitchen" in English is neuter (as is the Finnish equivalent: keittiö); the Spanish equivalent "cocina" is feminine. *Gender-differentiated pronouns* captures the intensity of gender distinctions in independent personal pronouns as either high or moderate/low/none. As an example, English is low as it only utilizes gender-differentiated pronouns in the third-person singular for he (derived forms: him, his, and himself) and she (derived forms: her, hers, and herself). Spanish is high as it requires gender-differentiated pronouns for the third person singular (he = él, she = ella) as well as for first, second, and third person plural (we = nosotros, nosotras; you = vosotros, vosotras; they = ellos, ellas). Finnish has no gender-differentiated pronouns, instead using hän, which has no gender distinction and requires the listener to use context such as the subject's name in order to determine whether the subject is male or female.

When applying linguistic relativity theory to gendered linguistic structures, the basic premise is that when a language highlights gender differences, individuals who speak the language are more likely to distinguish between males and females in their phrases, sentences, and dialogue (Siewierska, 2016). Linguistic structure asymmetries convey power such that the way a language is gendered may create and reinforce gender stereotypes and inequalities (Cameron, 1998; Prewitt-Freilino et al., 2012).

Adherence to gendered linguistic structures is required to communicate with others in a language and is acquired at a young age. For instance, a child whose first language has either no or weak gender marking (e.g., Finnish) acquires gender identity later than his/her counterparts with moderate (e.g., English) or strong (e.g., Hebrew) gender-marked languages (Guiora, Beit-Hallahmi, Fried, & Yoder, 1982). Children develop their language abilities, including how to manage different gendered linguistic structures, concurrently with other cognitive abilities and competencies, such as how to assign and associate gender (Mills, 2012). For example, speakers will learn to judge and categorize inanimate and abstract nouns as having a gender (Boroditsky, Schmidt, & Phillips, 2003). The early and persistent gendering of linguistic structures significantly impacts normative cultural values (Santacreu-Vasut et al., 2014). Gendered language can also perpetuate stereotypes of male and female activities, including whether these are positive and normal. For example, Sendén, Sikström, and Lindholm (2015) find that English-language Reuters news uses "he" pronouns nine times more frequently and also far more positively than "she" pronouns, and that Reuters uses "she" far more frequently in combination with words denoting gender. Gendered verbiage does not favor masculinity over femininity per se, rather gendered verbiage supports whatever stereotypes are characteristic of the society.

Gendered linguistic structures create and maintain structural differences throughout society, including labor market dynamics. That is, in environments where the linguistic structures are gender neutral, individuals may not have gendered prejudices about certain professions and positions (van der Velde, Tyrowicz, & Siwinska, 2015). By contrast, in a society where the dominant language requires extensive gender distinctions, individuals may have more biased perceptions of labor market possibilities. A growing body of empirical evidence reveals that countries in which the dominant language has more gendered linguistic structures have lower levels of female labor force participation (Mavisakalyan, 2011), shorter maternity leaves, and greater tolerance for gender-based discrimination (Givati & Troiano, 2012). These countries also have fewer females board directors, senior managers, and leaders of corporate teams (Santacreu-Vasut et al., 2014); higher wage gaps between men and women (Gay et al., 2015; van der Velde et al.); and greater marginalization of women in certain professions (Coates, 2015).

We argue that gendered linguistic structures will also affect a previously unexamined aspect of the labor market: the vast gender gap between male and female prevalence rates for early-stage entrepreneurial activity. A large body of research indicates that the comparatively small share of female entrepreneurs across countries is not fully explained by previously examined factors (Elam, 2008; Jennings & Brush, 2013; Kelley, Singer, & Herrington, 2016; Th  baud, 2015; World Bank, 2015). Consistent with the main tenets of linguistic relativity theory, we believe that individuals who speak languages with gendered linguistic structures are more likely to accept traditional gender roles (Hicks, Santacreu-Vasut, & Shoham, 2015; Santacreu-Vasut et al., 2014). The most traditional roles, across nearly every society, is that men provide for themselves and their family with wages earned through work outside the household, including as entrepreneurs, while women take care of the household work. Entrepreneurship is predominantly described and understood in masculine terms (Ahl, 2006) and as a male behavior (Gupta, Turban, Wasti, & Sikdar, 2009). Indeed, even the government policy discourse on entrepreneurship in countries such as Sweden and the United States “tends to reproduce women’s secondary position in society rather than improve it” (Ahl & Nelson, 2015, p. 274). When a certain type of work is presented in masculine terms, an individual may develop the perception that this work is gendered. For example, an individual may perceive that entrepreneurship is a “male” profession. Linguistic relativity theory then suggests that individuals will take actions based on these perceptions such that males will be more likely to pursue activities that are considered masculine and females will be more likely to pursue activities that are considered feminine. Furthermore, the gender gap in entrepreneurship will be higher in countries where the dominant language has more gendered linguistic structures as individuals must constantly consider and mark gender. Taken together, we expect:

Hypothesis 1: The tendency for men to be more likely than women to be involved in early-stage entrepreneurship activity will be even higher in countries in which the dominant language has gendered linguistic structures.

Data and Methodology

We match country-level data from the World Bank, World Values Survey (WVS), Global Entrepreneurship Monitor (GEM), Adult Population Survey (APS), the GEM National Expert Survey (NES), and World Atlas of Language Structures (WALS). We

include all available data from GEM for 2001–2015, comprising 109 countries and 728 observations.¹ To test our research question on this unbalanced longitudinal time-series panel, we use random-effects time series regression with a robust estimator to control for autocorrelation (Bergh, 1995). We use Stata’s `xtregar` command to handle autocorrelation associated without time-series data, and set the country as the identification variable to estimate our empirical model. We include the `re` (random-effects) option and create conservative estimations of standard errors for all coefficients in the model (Wooldridge, 2003). The technique creates estimations of longitudinal panel time series regression models which produce a matrix-weighted average between and within results. Time dummies control for contemporaneous correlations in the model.

Dependent Variable

We use GEM APS’s Total Early Stage Entrepreneurial Activity (a binary variable that captures whether an individual aged 18–64 is engaged in entrepreneurial activities for less than 42 months) to calculate the percent of men and women involved in early stage entrepreneurial activity in each country for each respective year the country participated in the GEM protocol (see Reynolds et al., 2005). The dependent variable, *Gender gap in entrepreneurial activity*, is the percentage of men involved in early-stage entrepreneurial activity divided by the percentage of women involved in early-stage entrepreneurial activity and varies yearly. A higher (lower) value indicates a lower (higher) share of female entrepreneurs relative to male entrepreneurs, while a value of one indicates parity.

Independent Variables

We use the WALS to code the independent variables, following Gay et al. (2015), Givati and Troiano (2012), Siewierska (2016), and Santacreu-Vasut et al. (2014) to identify languages with gendered linguistic structures. We use four dummy variables to capture gender distinctions in a country’s dominant language: number of genders, sex-based gender system, gender assignment in language, and gender-differentiated pronouns. All four gendered linguistic structure variables are used in Santacreu-Vasut et al. and Gay et al., and are described in the theoretical background. Number of genders is coded 1 = two genders and 0 = all other possibilities. Sex-based gender system is coded as 1 = gender system is linked to biological sex and 0 = no or not applicable. Gender assignment is coded as = 1 if the language assigns both semantic and formal genders to nouns and 0 = otherwise. And finally gender-differentiated pronouns are coded high = 1 and moderate, low, or no = 0. Although the languages with the most gendered structures score 1 along all these metrics, we test each marker independently, and later sum all four into an additive index for a robustness test. All independent variables for language are stable across the years.

1. As not all of our sample’s countries participated in the years for which data were collected from GEM APS, GEM NES, and WVS, we follow Reynolds (2010) to use multiple imputation for countries not surveyed in WVS but surveyed in GEM. Likewise, for years in which countries did not participate in GEM’s APS or NES (i.e., a country could participate every other year), we use multiple imputation to estimate missing data. Our approach requires each country to have at least two years of data in GEM APS and NES. The larger sample is an important trade-off when studying variance around the world (Thai & Turkina, 2013); this framework provided a panel sample size that is large enough and of sufficient variation to be representative of the world.

Control Variables

We incorporate 32 controls to capture a range of variables previously found to influence both male and female entrepreneurial activity rates. Formal economic structures such as national gross domestic product (*GDP per capita*), GDP growth, unemployment (Cowling & Bygrave, 2006), and labor force participation rate (Reynolds & Curtin, 2010) affect entrepreneurial activity; hence, we control for *GDP per capita purchasing power parity (PPP)*, *GDP growth rate*, *percent female unemployment*, *percent male unemployment*, *percent female labor force participation*, and *percent male labor force participation*. As informal structures such as gender inequality impact women's entrepreneurial participation rates (Baughn, Chua, & Neupert, 2006; Klyver et al., 2013) and are associated with gendered linguistic structures (Prewitt-Freilino et al., 2012), we include a *gender inequality index*. The WVS's cultural dimensions of authority (traditional versus secular rational values) and well-being (survival versus self-expressive values) significantly impact individuals' engagement in entrepreneurship (Reynolds, 2010), and thus we control for *well-being* and *authority*. We also control for the *year* (15 year dummies) and *total population*.

Prior research using GEM data identifies a range of country prevalence rates associated with entrepreneurial activity (Bosma, 2014), and thus we control for the following nine dimensions with GEM APS data: percent of *business angels* in a population, percent of people with *entrepreneurial intentions* in a population, percent of people who believe they have the appropriate *start-up skills* necessary to start a business in a population, percent of people who *perceive opportunities* for an entrepreneurial venture in a population, percent of people who *know an entrepreneur* in a population, percent of people who report that *entrepreneurship is a desirable career choice* in a population, percent of the population who report that the *media provides attention for entrepreneurship*, and percent of the population who report that *high status of successful entrepreneurs* in their society.

Extant research also identifies a range of entrepreneurial ecosystem factors that impact the venturing environment (Bosma, 2014; Levie & Autio, 2008), and thus we use the following GEM NES framework condition measures: *financial environment* in terms of access to entrepreneurial finance; *government policy and support* for entrepreneurship; *government policy and taxes* for entrepreneurship; *government programs* for entrepreneurship; *entrepreneurial education* in primary and secondary schools, universities, and continuing management education; *R&D transfer* in the form of policies and access conducive to R&D transfer for new growth firms; *commercial infrastructure access* for new entrepreneurs; *internal market dynamics* associated with change and openness; *internal market burdens* in terms of entry regulations to start a business; *physical infrastructure and services* for new firms in terms of utilities and communication; and *cultural, social norms supportive* to venturing activity as a viable career choice (see Appendix B). GEM NES scales' reliability is supported in Reynolds et al. (2005). GEM NES items are based on a five-point Likert scale (1 = low to 5 = high) and aggregated for each year a country participated to generate an average.

Finally, we include a dummy variable for countries with *multiple languages* (1 = one official language, 0 = multiple official languages). Appendix A contains all independent variables and cases counts for each country.

Results

Table 1 shows the descriptive statistics and correlations except for dummy years (summary statistics are available from the authors). To examine whether multivariate multicollinearity is an issue, we calculate variance inflation factors (VIFs). All VIFs were

Table 1

Descriptive Statistics and Bivariate Correlations

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. GDP (PPP)	23,983.235	18,274.306	1									
2. % GDP growth	3.894	4.332	-.170**	1								
3. % Female labor force	51.506	11.837	.126**	.015	1							
4. % Female unemployment	9.447	6.624	-.326**	-.112**	-.357**	1						
5. % Male labor force	71.196	8.153	.126**	.236**	.236**	.760**	1					
6. % Male unemployment	7.788	5.205	-.215**	-.144**	-.262**	-.166**	-.350**	1				
7. Total population	7,371,210.426	205,415,550.294	-.021	.186**	-.001	-.173**	.173**	-.123**	1			
8. % Business angels	4.945	4.048	-.266**	.051	.177**	-.033	.243**	-.060	.093*	1		
9. % Entrepreneurial intentions	18.728	14.995	-.480**	.107**	.095*	.119**	.309**	-.019	.090**	.665**	1	
10. % Start-up skills	49.049	15.590	-.393**	.002	.040	.191**	.263**	.026	-.076*	.519**	.676**	1
11. % Fear of failure	33.748	9.053	.108**	-.058	-.096**	.015	-.080*	.039	.008	-.190**	-.280**	-.432**
12. % Perceive opportunities	39.425	16.650	-.115**	.140**	.218**	-.091*	.327**	-.215**	-.027	.532*	.575**	.633**
13. % Know an entrepreneur	39.726	12.019	-.251**	.174**	.196**	-.050	.258**	-.095*	.112**	.554**	.468**	.547**
14. % Entrepreneurship is a desirable career choice	64.223	14.020	-.370**	.108**	-.047	.225**	.243**	.046	.035	.302*	.575**	.591**
15. % Media attention for entrepreneurship	60.388	14.227	-.113**	.183**	.235**	-.124**	.362**	-.219**	.138**	.259**	.389**	.314**
16. % High status of successful entrepreneurs	69.409	10.576	-.039	.022	.042	.042	.168**	-.109**	.026	.251**	.323**	.360**
17. Financial environment	2.754	0.705	.211**	.006	.010	-.194**	-.025	-.174**	.033	-.072	-.168**	-.228**
18. Government policy & support	2.734	0.695	.186**	-.003	.028	-.138**	.020	-.115**	.011	.004	-.094*	-.213**
19. Government policy & taxes	2.536	0.765	.288**	.026	.064	-.189**	.099**	-.164**	-.042	.047	-.110**	-.187**
20. Government programs	2.768	0.696	.288**	-.025	.054	-.206**	-.005	-.142**	-.050	.056	-.158**	-.192**
21. Entrepreneurial education	2.470	0.652	.122**	.111**	.044	-.136**	.022	-.100**	-.062	-.023	-.075*	-.057
22. R&D transfer	2.544	0.593	.310**	-.004	.024	-.206**	-.021	.129**	.011	-.125**	-.253**	-.289**
23. Commercial infrastructure access	3.274	0.713	.192**	.002	.004	-.144**	-.024	-.075*	-.059	-.049	-.157**	-.108**
24. Internal market dynamics	3.146	0.830	-.103**	.055	-.037	-.038	.026	-.013	.187**	.039	.052	-.118**
25. Internal market burdens	2.761	0.602	.214**	.001	.080*	-.208**	.045	-.158**	-.035	.001	-.136**	-.132**
26. Physical infrastructure and services	3.992	0.922	.204**	-.032	-.008	-.185**	.027	-.119**	.000	-.025	-.152**	-.175**
27. Cultural, social norms supportive	2.983	0.761	.057	.032	.066	-.161**	.190**	-.138**	.087*	.148**	.100**	.036
28. Gender inequality index	0.283	0.169	-.590**	.159**	-.169**	.225**	.316**	.011	.161**	.425**	.675**	.578**
29. Authority	0.257	0.457	.411**	-.073*	.067	-.164**	-.302**	.056	-.015	-.305**	-.503**	-.563**
30. Well-being	0.168	0.342	-.409**	.127**	-.233**	.181**	.079*	.123**	.107**	.234**	.422**	.134**
31. Number of genders: Two	0.379	0.486	-.239**	.019	-.170**	.093*	.203**	-.045	.012	.089*	.291**	.280**
32. Sex-based gender system: Yes	0.721	0.449	-.036	-.071	-.085*	.097**	.006	.074*	-.101**	-.017	.032	.347**
33. Gender assignment: High	0.407	0.492	-.214**	.045	-.117**	.188**	.138**	.055	-.008	.119**	.241**	.238**

Table 1

Continued

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
34. Gender-differentiated pronouns: High	0.241	0.428	-.298**	.044	-.186**	.126**	.250**	-.046	-.088*	.162**	.375**	.420**
35. Gender gap in early-stage entr. activity	1.92	1.24	.119**	-.049	-.181**	.037	-.068**	-.001**	-.047*	-.192**	-.163**	-.192**
Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
12. % Perceive opportunities	-.287**	1										
13. % Know an entrepreneur	-.193**	.583**	1									
14. % Entrepreneurship is a desirable career choice	-.150**	.437**		1								
15. % Media attention for entrepreneurship	-.148**	.462**		.353**								
16. % High status for successful entrepreneurs	-.065	.429**		.427**	1							
17. Financial environment	.107**	-.050		-.249**	-.068	1						
18. Government policy & support	.129**	-.013		.124**	-.011	.667**	1					
19. Government policy & taxes	.086*	.054		.153**	-.015	.575**	.695**	1				
20. Government programs	.066	.001		.153**	-.115**	.668**	.738**	.707**				
21. Entrepreneurial education	.038	.070		.127**	-.060	.602**	.579**	.544**	1			
22. R&D transfer	.143**	-.114**		-.101**	-.117**	.731**	.692**	.656**	.620**	1		
23. Commercial infrastructure access	.083*	.022		-.293**	-.062	.672**	.594**	.595**	.641**	.710**	1	
24. Internal market dynamics	.193**	.047		-.045	-.047	.413**	.447**	.344**	.435**	.412**	.407**	
25. Internal market burdens	.090*	.042		-.235**	-.048	.688**	.676**	.680**	.620**	.738**	.738**	.383**
26. Physical infrastructure and services	.121**	-.026		-.085*	-.118**	.620**	.614**	.641**	.562**	.696**	.701**	.500**
27. Cultural, social norms supportive	.093*	.185**		-.108**	.072	.629**	.591**	.587**	.637**	.619**	.591**	.485**
28. Gender inequality index	-.215**	.424**		.518**	.267**	.629**	-.147**	-.184**	-.122**	-.313**	-.193**	.057
29. Authority	.206**	-.422**		-.443**	-.257**	.110**	.038	.090*	.032	.194**	.083*	.025
30. Well-being	.054	.047		.290**	.131**	-.114**	-.034	-.064	-.096**	-.199**	-.140**	.156**
31. Number of genders: Two	-.040	.260**		.280**	.040	-.192**	.117**	-.124**	-.068	-.147**	-.091*	-.113**
32. Sex-based gender system: Yes	-.086*	.084*		-.027	-.238**	-.133**	-.175**	-.141**	-.029	-.103**	.044	-.207**
33. Gender assignment: High	-.012	.152**		-.075*	.029	-.178**	-.030	.000	-.051	-.060	-.009	-.156**
34. Gender-differentiated pronouns: High	-.145**	.289**		.318**	.055	-.207**	-.116**	-.076*	-.065	-.137**	-.087*	-.152**
35. Gender gap in early-stage entr. activity	.090**	-.160**		-.067**	0.036	0.003	-.175	.011	-.042	.001	-.011	.025

Variable	25	26	27	28	29	30	31	32	33	34
26. Physical infrastructure and services	.690**	1								
27. Cultural, social norms supportive	.662**	.585**	1							
28. Gender inequality index	-.185**	-.199**	.090*	1						
29. Authority	.088*	.130**	-.131**	-.685**	1					
30. Well-being	-.173**	-.128**	-.009	.523**	-.056	1				
31. Number of genders: Two	-.109**	-.064	-.064	.331**	-.260**	.111**	1			
32. Sex-based: Yes	-.023	-.092*	-.092*	.023	-.080*	-.169**	.315**	1		
33. Gender assignment: High	-.049	-.032	.016	.346**	-.186**	.160**	.492**	.323**	1	
34. Gender-differentiated pronouns: High	-.104**	-.044	.039	.428**	-.397**	.176**	.627**	.276**	.681**	1
35. Gender gap in early-stage Enrr. Activity	.001	-.015	.025**	.095**	.147**	.063**	.004	.017**	.014	.016**

** $p < .01$, * $p < .05$.

lower than three, which is under the critical value threshold of 10 (Hsieh, Lavori, Cohen, & Feussner, 2003; Neter, Wasserman, & Kutner, 1989) and are available from the authors. Consequently, multicollinearity does not appear to influence our results.

Our sample's set of languages includes 38% with two genders, 72% with sex-based systems, 40% with gender assignment, and 24% with high levels of gender-differentiated pronouns. The average gender gap of 1.9 indicates that men are 1.9 times more likely than women to start a venture.

Table 2 reports the results for our controls (model 1), and the independent main effects of gendered linguistic structures (model 2). An increase in the gender gap in early-stage entrepreneurial activity is significantly associated with both sex-based systems ($\beta = 0.451, p = .049$) and gender-differentiated pronouns ($\beta = 0.520, p = .054$), but is not significant for number of genders ($\beta = 0.048, p = .848$) and gender assignment ($\beta = -.291, p = 0.274$). Overall, men participate 2.1 (95% confidence interval [1.9, 2.3]) times more than women when their language uses a sex-based system. Conversely, when the dominant language does not utilize a sex-based gender system, men participate 1.6 (95% confidence interval [1.3, 2.0]) times more than women. Men participate 2.4 (95% confidence interval [1.9, 2.9]) times more than women in entrepreneurial activity when the language uses a high level of gender-differentiated pronouns versus 1.8 (95% confidence interval [1.6, 2.1]) times higher than no/low/moderate gender-differentiated pronouns. Taken together, sex-based systems and gender-differentiated pronouns are associated with significantly higher gender gaps in entrepreneurial activity. The R^2 change between Models 1 and 2 is .04, and between Models 1 and 3 is .05.

Robustness Checks

We test the sensitivity of our main results by creating an additive index variable from the sum of the scores of the four gendered linguistic structure dummies. Using this measure, 19% of our sample have no gendered linguistic structures (score = 0), 35% have weak gendered linguistic structures (score = 1), 17% have moderate gendered linguistic structures (score = 2), 5% have high gendered linguistic structures (score = 3), and 22% have very high gendered linguistic structures (score = 4). This additive index illustrates how an increase in gendered linguistic structures corresponds to a greater gender gap in entrepreneurial activity (see Table 2's model 3; $\beta = 0.135, p = .045$). That is, for each one-unit increase in the additive scale, there is a corresponding .135 increase in the gender gap in entrepreneurial activity. Our sample's average additive index variable is about 2; the highest level is 4. For countries with an additive index of 2 for gendered linguistic structures, men participate 2 (95% confidence interval [1.8, 2.2]) times more than women in entrepreneurial activity. At the highest level (additive score = 4), men are 2.3 (95% confidence interval [1.9, 2.6]) times more likely than women to become entrepreneurs.

Discussion

We show that gendered linguistic structure accounts for approximately 4% of previously unexplained variance in the gender gap in early-stage entrepreneurial activity. Our study provides seminal evidence of the relevance of linguistic relativity theory in entrepreneurship, and the importance of considering gendered linguistic structure when developing theory about gender differences in entrepreneurial activity. That is, gendered language may shape thought and action concerning entrepreneurial activity undertaken by men and women. Our

Table 2

Results of Random Effects Panel Regression Analysis for the Effect of Gender Marking in Language on the Gender Gap in Early-Stage Entrepreneurial Activity

Variable	Control model (A)			Main effects model (G)			Robustness additive model (3)		
	Coefficient	SE	p	Coefficient	SE	p	Coefficient	SE	p
GDP (PPP)	6.20E-07	5.75E-07	.281	6.34E-06	4.02E-06	.115	5.53E-06	3.95E-06	.161
% GDP growth	-0.002	0.002	.365	-0.001	0.013	.952	-0.0003672	0.0124384	.976
% Female labor force	0.003	0.001	.002	-0.004	0.006	.5	-0.004	0.006	.507
% Female unemployment	0.001	0.002	.99	0.011	0.013	.39	0.006	0.013	.624
% Male labor force	0.002	0.001	.065	0.003	0.008	.738	0.003	0.008	.736
% Male unemployment	0.001	0.002	.892	-0.011	0.017	.529	-0.005	0.016	.761
Total population	1.27E-11	5.54E-11	.819	-6.13E-11	3.72E-10	.869	-1.23E-10	3.71E-10	.739
% Business angels	0.004	0.003	.149	-0.037	0.019	.054	-0.037	0.019	.054
% Entrepreneurial intentions	-0.002	0.001	.037	0.004	0.007	.592	0.002	0.007	.719
% Start-up skills	0.001	0.002	.897	-0.017	0.008	.028	-0.015	0.008	.05
% Fear of failure	-0.002	0.001	.048	-0.001	0.007	.902	0.001	0.007	.877
% Perceive opportunities	0.001	0.001	.454	0.002	0.006	.75	0.004	0.006	.532
% Know an entrepreneur	0.003	0.001	.004	-0.013	0.007	.067	-0.016	0.007	.022
% Entrepreneurship is a desirable career choice	0.001	0.001	.186	-0.002	0.006	.7	-0.001	0.006	.819
% Media-attention for entrepreneurship	0.001	0.001	.217	-0.001	0.005	.789	-0.002	0.005	.756
% High status for successful entrepreneurs	-0.004	0.001	0	0.015	0.006	.02	0.015	0.006	.021
Financial environment	-0.009	0.015	.548	0.099	0.109	.363	0.098	0.106	.356
Government policy & support	0.006	0.017	.723	0.015	0.117	.88	-0.004	0.115	.975
Government policy Sc taxes	-0.023	0.015	.121	0.116	0.104	.264	0.082	0.102	.42
Government programs	0.005	0.018	.789	-0.166	0.122	.174	-0.13	0.12	.279
Entrepreneurial education	0.001	0.017	.962	-0.04	0.115	.728	-0.032	0.114	.781
R&D transfer	-0.016	0.021	.446	0.008	0.147	.957	0.009	0.146	.953
Commercial infrastructure access	-0.006	0.016	.71	-0.031	0.112	.783	-0.027	0.112	.811
Internal market dynamics	-0.014	0.012	.253	0.151	0.083	.068	0.142	0.082	.084
Internal market burdens	-0.018	0.019	.337	0.075	0.134	.574	0.077	0.131	.556
Physical infrastructure and services	-0.003	0.012	.813	0.055	0.086	.526	0.042	0.085	.618
Cultural, social norms supportive	0.028	0.016	.08	-0.063	0.111	.569	-0.058	0.11	.598

Table 2

Continued

Variable	Control model (A)			Main effects model (G)			Robustness additive model (3)		
	Coefficient	SE	p	Coefficient	SE	p	Coefficient	SE	p
Gender inequality* index									
Authority	0.156	0.144	.281	0.679	0.975	.487	0.432	0.958	.652
Well-being	−0.09	0.042	.032	0.032	0.281	.909	−0.079	0.273	.771
	0.019	0.049	.698	0.289	0.325	.375	0.353	0.32	.27
2001	−0.185	0.062	.003	0.698	0.433	.107	0.709	0.428	.098
2002	−0.195	0.059	.001	0.784	0.412	.057	0.802	0.407	.049
2003	−0.192	0.061	.002	0.917	0.423	.03	0.932	0.418	.026
2004	−0.164	0.06	.006	0.723	0.416	.082	0.731	0.412	.076
2005	−0.133	0.059	.023	0.734	0.408	.072	0.742	0.404	.066
2006	−0.147	0.057	.01	0.962	0.398	.016	0.959	0.394	.015
2007	−0.12	0.056	.032	0.471	0.389	.226	0.471	0.384	.221
2008	−0.145	0.056	.01	0.585	0.388	.132	0.59	0.383	.124
2009	−0.165	0.056	.003	0.732	0.391	.061	0.737	0.386	.056
2010	−0.117	0.056	.037	0.553	0.389	.155	0.556	0.385	.148
2011	−0.106	0.056	.058	0.402	0.39	.304	0.415	0.387	.283
2012	−0.114	0.056	.042	0.644	0.387	.096	0.633	0.384	.099
2013	−0.104	0.055	.058	0.4	0.382	.294	0.382	0.377	.312
2014	−0.063	0.054	.245	0.31	0.374	.407	0.303	0.371	.414
2015	(omitted)			(omitted)			(omitted)		
Multiple languages: Dummy	0.039	0.034	.261	0.088	0.244	.719	−0.01	0.23	.434
Number of genders: Two				0.048	0.251	.848			
Sex-based gender system: Yes				0.451	0.238	.049			
Gender assignment: High				−0.291	0.266	.274			
Gender-differentiated pronouns: High				0.52	0.327	.054			
Additive index: Gendered linguistic structures									
Intercept	0.612	0.185	.001	0.614	1.274	.63	0.135	0.067	.045
Wald X ²	95.96			105.24			0.771	1.262	.541
df	46			50			47		
p value	<0.001			<0.001			<0.001		

Table 2
Continued

Variable	Control model (A)			Main effects model (G)			Robustness additive model (3)		
	Coefficient	SE	p	Coefficient	SE	p	Coefficient	SE	p
R ² within	0.07			0.16			0.1		
R ² between	0.41			0.48			0.43		
R ² overall	0.3			0.34			0.35		
R ² Δ				0.04			0.05		
N	728			728			728		
Countries	109			109			109		

findings are consistent with prior work linking gendered linguistic structures to decreases in female labor force participation (Santacreu-Vasut et al., 2014), and provide new evidence to suggest that gendered linguistic structures reinforce gender stereotypes and discourage women's entry into entrepreneurship. Consequently, gendered linguistic structures may advance our understanding of persistent gender differences in entrepreneurial activity across countries and time. One implication for policy is that governments should consider explicitly incorporating female verbiage in messages aimed at promoting entrepreneurship.

We chose four gendered linguistic structures that are most frequently identified in extant research as factors affecting individual and organizational behavior, finding significant support for sex-based systems and gendered pronouns. The nonfindings regarding number of genders may be due to the fact that there are relatively few differences in number of genders, and the fact that a few languages are changing the number of genders. The nonfindings of gender assignment may be due to the fact that women are less likely to be in the labor force (Gay et al., 2015), thus explaining our negative but nonsignificant coefficient narrowing the gender gap by entering into entrepreneurship.

Before highlighting potential future research directions, we wish to acknowledge three key limitations of our study. First, although linguistic relativity theory predicts that language causes thoughts and behaviors, our tests only model the difference between national level male and female entrepreneurial activity, albeit controlling for a range of cultural, economic, and ecosystem factors. Second, our findings only support the effects of two gendered linguistic structures: sex-based systems and gender-differentiated pronouns. Third, our study only examines early-stage entrepreneurship.

Our study highlights a number of promising directions for future research. From a policy perspective, future research could examine whether policy changes such as those under way in Norway and Sweden to create more genderless languages have an impact on men's and women's entrepreneurial activity. Moreover, future research could investigate the impact of other linguistic structures such as strong/weak future tense, possessive marking, and motion coding. The potential for future tense emerges from research reporting that speakers of languages with weak future time reference perceive the future as closer, and display more future-oriented behavior such as greater savings, more wealth at retirement, less smoking, safer sex, and less obesity (Chen, 2013), while strong future time speakers reduce the psychological importance of the future (Liang, Marquis, Renneboog, & Sun, 2014). Taken together with findings that individuals who focus on the future have higher levels of autonomy, opportunities, and recognition (Shipp, Edwards, & Lambert, 2009), weak future tense language speakers may be more likely to pursue entrepreneurial activity. Moreover, as women tend to live in the present whereas men are future-oriented (Cottle, 1976), there may be gender differences. On a related point, future-oriented entrepreneurs may be pursuing opportunities, in contrast to those who see entrepreneurship as "no better choice." We, therefore, suggest future research which explores the relationship between linguistic structures and opportunity and necessity-based entrepreneurship. Transnational entrepreneurship research (Drori, Honig, & Wright, 2009) could be extended to examine whether individuals, particularly women, who speak two or more languages leverage distinct linguistic structures.

Conclusions

Using a comprehensive global data set, we examine whether gendered linguistic structures widen the gender gap in entrepreneurial activity between men and women. We find that sex-based systems and gender-differentiated pronouns are associated with a decreased probability of women engaging in early-stage entrepreneurial activity when

compared to men. The present research expands our knowledge of psycholinguistic processes affecting venturing activity, stressing the need to incorporate linguistic structures into the study of cross-cultural entrepreneurship.

Appendix A: Language Sample Frequencies for Gendered Linguistic Structures²

	# Of genders		Sex-based system		Gender assignment		Gender-diff. pronouns	
	1.00		1.00		1.00		1.00	
Language	Count	Count	Count	Count	Count	Count	Count	Count
Akan	3	0	3	0	3	0	3	0
Albanian	0	1	1	0	0	18	1	0
Arabic	0	18	0	18	0	18	0	18
Bemba	3	0	0	3	3	0	0	3
Bengali	1	0	1	0	1	0	1	0
Bislama	1	0	0	1	0	1	1	0
Bulgarian	1	0	1	0	1	0	1	0
Cantonese	5	0	5	0	5	0	5	0
Chichewa	2	0	2	0	2	0	2	0
Czech	3	0	0	3	3	0	3	0
Danish	0	13	13	0	13	0	13	0
Dutch	32	0	0	32	32	0	32	0
English	92	0	0	92	92	0	92	0
Estonian	4	0	4	0	4	0	4	0
Finnish	15	0	15	0	0	15	15	0
French	0	17	0	17	0	17	17	0
Georgian	1	0	1	0	0	1	1	0
German	29	0	0	29	0	29	29	0
Greek	13	0	0	13	0	13	13	0
Hausa	0	3	0	3	3	0	0	3
Hebrew	10	0	10	0	0	10	0	10
Hindi	0	8	0	8	8	0	8	0
Hungarian	14	0	14	0	14	0	14	0
Icelandic	9	0	0	9	9	0	9	0
Italian	0	14	0	14	14	0	14	0
Japanese	14	0	14	0	14	0	14	0
Javanese	4	0	4	0	0	4	4	0
Kazakh	3	0	3	0	3	0	3	0
Korean	9	0	9	0	9	0	9	0
Latvian	0	10	0	10	0	10	10	0
Lithuanian	0	4	0	4	4	0	4	0
Luganda	7	0	7	0	7	0	7	0
Luxembourgish	3	0	0	3	3	0	3	0
Macedonian	5	0	0	5	0	5	5	0
Malay	8	0	8	0	8	0	8	0

2. Gendered linguistic structures calculated using World Atlas Language Studies (WALS) based on prior research by Gay et al. (2015), Givati and Troiano (2012), Siewierska (2016), and Santacreu-Vasut et al. (2014).

Appendix A

Continued

	# Of genders		Sex-based system		Gender assignment		Gender-diff. pronouns	
	1.00		1.00		1.00		1.00	
Language	Count	Count	Count	Count	Count	Count	Count	Count
Mandarin	22	0	22	0	0	22	22	0
Ndonga	1	0	0	1	1	0	0	1
Norwegian	15	0	0	15	15	0	15	0
Oromo (Harar)	0	1	0	1	1	0	1	0
Persian	8	0	8	0	8	0	8	0
Polish	8	0	0	8	0	8	8	0
Portuguese	0	30	0	30	30	0	30	0
Romanian	9	0	0	9	9	0	9	0
Russian	10	0	0	10	0	10	10	0
Serbian-Croatian	25	0	0	25	25	0	25	0
Slovak	19	0	0	19	19	0	19	0
Spanish	0	140	0	140	140	0	0	140
Swedish	0	13	13	0	0	4	13	0
Tagalog	0	4	0	4	4	0	4	0
Thai	9	0	9	0	9	0	9	0
Tswana	4	0	4	0	4	0	4	0
Turkish	7	0	7	0	0	7	7	0
Vietnamese	3	0	3	0	3	0	3	0
Xiamen	7	0	7	0	0	7	7	0
Zulu	14	0	14	0	0	14	14	0

Appendix B: GEM NES Items Used to Calculate Entrepreneurial Ecosystem Dimensions

Financial Environment; Cronbach's alpha = 0.78	
A01	In my country, there is sufficient equity funding available for new and growing firms
A02	In my country, there is sufficient debt funding available for new and growing firms
A03	In my country, there are sufficient government subsidies available for new and growing firms
A04	In my country, there is sufficient funding available from private individuals (other than founders) for new and growing firms
A05	In my country, there is sufficient venture capitalist funding available for new and growing firms
A06	In my country, there is sufficient funding available through initial public offerings (IPOs) for new and growing firms
Government Policy & Support; Cronbach's alpha = 0.78	
B01	In my country, government policies (e.g., public procurement) consistently favor new firms
B02	In my country, the support for new and growing firms is a high priority for policy at the national government level
B03	In my country, the support for new and growing firms is a high priority for policy at the local government level
B04	In my country, new firms can get most of the required permits and licenses in about a week
B05	In my country, new firms can get most of the required permits and licenses in about a week

Appendix B

Continued

- B06 In my country, taxes and other government regulations, are applied to new and growing firms in a predictable and consistent way
B07 In my country, coping with government bureaucracy, regulations, and licensing requirements is not unduly difficult for new and growing firms

Government Programs; Cronbach's alpha = 0.70

- C01 In my country, a wide range of government assistance for new and growing firms can be obtained through contact with a single agency
C02 In my country, science parks and business incubators provide effective support for new and growing firms
C03 In my country, there are an adequate number of government programs for new and growing businesses
C04 In my country, the people working for government agencies are competent and effective in supporting new and growing firms
C05 In my country, almost anyone who needs help from a government program for a new or growing business can find what they need
C06 In my country, government programs aimed at supporting new and growing firms are effective

Entrepreneurial Education; Cronbach's alpha = 0.83

- D01 In my country, teaching in primary and secondary education encourages creativity, self-sufficiency, and personal initiative
D02 In my country, teaching in primary and secondary education provides adequate instruction in market economic principles
D03 In my country, teaching in primary and secondary education provides adequate attention to entrepreneurship and new firm creation
D04 In my country, colleges and universities provide good and adequate preparation for starting up and growing new firms
D05 In my country, the level of business and management education provides good and adequate preparation for starting up and growing new firms
D06 In my country, the vocational, professional, and continuing education systems provide good and adequate preparation for starting up and growing new firms

R&D Transfer; Cronbach's alpha = 0.78

- E01 In my country, new technology, science, and other knowledge are efficiently transferred from universities and public research centers to new and growing firms
E02 In my country, new and growing firms have just as much access to new research and technology as large, established firms
E03 In my country, new and growing firms can afford the latest technology
E04 In my country, there are adequate government subsidies for new and growing firms to acquire new technology
E05 In my country, the science and technology base efficiently supports the creation of world-class new technology-based ventures in at least one area
E06 In my country, there is good support available for engineers and scientists to have their ideas commercialized through new and growing firms

Commercial Infrastructure Access; Cronbach's alpha = 0.89

- F01 In my country, there are enough subcontractors, suppliers, and consultants to support new and growing firms
F02 In my country, new and growing firms can afford the cost of using subcontractors, suppliers, and consultants
F03 In my country, it is easy for new and growing firms to get good subcontractors, suppliers, and consultants
F04 In my country, it is easy for new and growing firms to get good, professional legal and accounting services
F05 In my country, it is easy for new and growing firms to get good banking services (checking accounts, foreign exchange transactions, letters of credit, and the like)

Internal Market Dynamics; Cronbach's alpha = 0.70

- G01 In my country, the markets for consumer goods and services change dramatically from year to year
G02 In my country, the markets for business-to-business goods and services change dramatically from year to year
G03 In my country, new and growing firms can easily enter new markets
G04 In my country, the new and growing firms can afford the cost of market entry
G05 In my country, new and growing firms can enter markets without being unfairly blocked by established firms
G06 In my country, the anti-trust legislation is effective and well enforced

Physical Infrastructure and Services; Cronbach's alpha = 0.80

- H01 In my country, the physical infrastructure (roads, utilities, communications, waste disposal) provides good support for new and growing firms
H02 In my country, it is not too expensive for a new or growing firm to get good access to communications (phone, Internet, etc.)
H03 In my country, a new or growing firm can get good access to communications (telephone, Internet, etc.) in about a week
H04 In my country, new and growing firms can afford the cost of basic utilities (gas, water, electricity, sewer)
H05 In my country, new or growing firms can get good access to utilities (gas, water, electricity, sewer) in about a month

Cultural, Social Norms Supportive; Cronbach's alpha = 0.88

- I01 In my country, the national culture is highly supportive of individual success achieved through own personal efforts
I02 In my country, the national culture emphasizes self-sufficiency, autonomy, and personal initiative
I03 In my country, the national culture encourages entrepreneurial risk-taking
I04 In my country, the national culture encourages creativity and innovativeness
I05 In my country, the national culture emphasizes the responsibility that the individual (rather than the collective) has in managing his/her own life
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