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RESEARCH NOTE

The interrelationships between corporate political activity and corporate environmental performance: the role of language diversity

Amir Shoham[1] · Jedrzej George Frynas[2] · Ahmad Arslan[3] · Ofra Bazel-Shoham[1] · Sang Mook Lee[4] · Zaheer Khan[5] · Shlomo Tarba[6]

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Abstract
Language affects almost every aspect of management in multinational enterprises (MNEs) but little is known about the impact of language on environmental performance. Our study investigates how language diversity affects the environmental performance of MNEs worldwide. We show that the grammatical structure of a language – specifically the first pronoun drop – is an important factor explaining the environmental performance of firms. Our analysis of 4454 company-year observations suggests that MNEs operating in societies that permit the first pronoun drop tend to have better environmental performance. Furthermore, we explore the impact of linguistic structure on the relationship between environmental performance and corporate political activity (CPA). We find that using the first pronoun drop of the local language moderates the influence of CPA on firms' environmental performance. Our study concludes that international managers must pay greater attention to the neglected role of language in implementing environmental initiatives.

Keywords Language · First pronoun drop · Nonmarket strategies · CPA · Environmental performance

Introduction

International business scholarship recognizes that language affects almost every aspect of management in multinational enterprises (MNEs) (Piekkar et al., 2022; Tenzer et al., 2017). As cross-border institutional multiplicity is a defining feature of MNEs (Meyer et al., 2011; Sun et al., 2021), MNEs face different dominant languages within their home country, host countries, and supranational institutions. Languages fundamentally shape concepts such as corporate social responsibility (CSR) and stakeholder management across different countries (Fassin et al., 2015; Selmier et al.,

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✉ Jedrzej George Frynas
george.frynas@open.ac.uk

Amir Shoham
amir.shoham@temple.edu

Ahmad Arslan
ahmad.arslan@oulu.fi

Ofra Bazel-Shoham
ofra.shoham.bazel@temple.edu

Sang Mook Lee
sxl65@psu.edu

Zaheer Khan
zaheer.khan@abdn.ac.uk

Shlomo Tarba
s.tarba@bham.ac.uk

[1] Fox School of Business, Temple University, Philadelphia, USA

[2] The Open University, Milton Keynes, UK

[3] Department of Marketing, Management & International Business, Oulu Business School, University of Oulu, Oulu, Finland

[4] Penn State Great Valley School of Graduate Professional Studies, Pennsylvania State University, Malvern, USA

[5] Business School, University of Aberdeen, Aberdeen, Scotland, UK

[6] Birmingham Business School, University of Birmingham, Birmingham, UK

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2015). However, scholarship still needs to address how languages affect the CSR performance of MNEs.

Many studies have explored how national cultural practices – typically measured by Hofstede's dimensions – influence CSR and corporate political activity (CPA) performance (e.g., Barron, 2011; Graafland & Noorderhaven, 2020), entirely ignoring the role of language as the underpinning of culture. However, linguistics and cognitive psychology research unequivocally suggest that language does not simply reflect culture, as some institutionalists have previously argued (e.g., North, 1990). Rather, language structure profoundly influences how speakers think, perceive the world, and define goals (e.g., Athanasopoulos & Bylund, 2013; Stutterheim et al., 2012). Following the communicative institutionalist view, communication is key for institutionalization, which occurs when humans interact through primarily linguistic processes and collectively form shared understandings of reality. This view presumes that the use of language – rather than being the conduit for transmitting cognitive content – affects cognitive change and hence constantly produces and reproduces institutions (e.g., Cornelissen et al., 2015; Phillips et al., 2004). Adopting this view, we hypothesize that language variety can help explain differences in the environmental performance of MNEs globally.

Drawing on the nonmarket strategy literature, we further surmise that language variety can influence how MNEs obtain societal consensus related to environmental management. MNE nonmarket strategies – encompassing CPA and CSR strategies – form a 'critical component of global strategy' (Sun et al., 2021: 1819). Nonmarket scholarship has increasingly noted complementarity (rather than substitution) between CPA and CSR, suggesting that CPA may help to increase CSR activities' credibility and legitimacy (den Hond, Rehbein, Bakker de, & Lankveld, 2014; Rehbein & Schuler, 2015; cf. Mellahi et al., 2016). In other words, MNEs that actively engage in CPAs increasingly tend to be environmentally responsible on their own, as environmental issues such as climate change have increasingly become a crucial concern for MNE stakeholders (e.g., Casanova & Miroux, 2022; Sun et al., 2021). Following the communicative institutionalist view, we believe that language variety also affects how CPA affects environmental performance.

Our study focuses on the drop of the first pronoun in a language. In some languages, the first pronoun (such as 'Yo' in Spanish) can be left out in a sentence without losing the meaning of the sentence (i.e., "first pronoun drop"). For example, the English sentence "I speak" may be translated either as "Yo hablo" or "Hablo" in Spanish. In other words, pronoun drop is permitted in Spanish but not in English, as "I" is required to make sense of the sentence (Davis & Abdurazokzoda, 2016:544).

We empirically demonstrate that MNEs from societies with a dominant language that allows the first pronoun drop exhibit better environmental performance. We further find that MNEs that allocate greater attention and resources to CPA tend to exhibit better environmental performance. The positive effect of CPA on environmental performance is negatively moderated for MNEs from countries with the first pronoun drop.

Our contribution lies in bringing linguistic structure into the MNE nonmarket strategy literature. First, we theorize and empirically establish a direct relationship between the dominant national language of an MNE and environmental performance. We demonstrate that linguistic structure – specifically the usage of the first pronoun drop (Kashima & Kashima, 1998; Yu et al., 2016) – is an essential factor behind the better environmental performance of MNEs in such societies. Second, prior studies have investigated the link between CPA and CSR activities of firms (e.g., den Hond et al., 2014; Rehbein & Schuler, 2015) but have not specifically addressed the relationship between MNE CPA efforts and environmental performance. We uniquely investigate the role played by the resources dedicated by MNEs to CPA and that of the moderating influence of linguistic structure concerning the environmental performance of MNEs.

Theory

A linguistic perspective on environmental performance

When faced with institutional multiplicity, MNEs must address varied and often conflicting institutional pressures – including different languages – at host country, home country, and supranational levels (Sun et al., 2021). However, while informal institutions shape MNE nonmarket strategies (e.g., Carney et al., 2022; Graafland & Noorderhaven, 2020), the role of languages has been omitted. We, therefore, turn to scholarship in linguistics to provide insights on how language may impact pro-environmental behaviors.

Following the Sapir–Whorf hypothesis, linguistic relativity claims that languages differ in crucial respects, including structure and syntax, and that these differences systematically shape thought and behavior (Lucy, 2016; Reines & Prinz, 2009). Scholarship has linked the language used in a society with both individual and societal cognition (Boroditsky et al., 2003; Cicourel, 1974). Ecolinguistics scholarship has noted differences between languages regarding the human concern for the natural environment (Penz & Fill, 2022; Trampe, 1996). Most pertinently, Chawla's (1991) seminal study compared Amerindian languages and English, concluding that Amerindian languages promoted care for the natural environment, while English promoted an unecological stance.

Scholars have long noted that unecological ideas and ideologies are embedded in grammatical structures (Goatly, 1996; Halliday, 1990), which are stable features that have often not changed for millennia and capture the collective mindset

inherited by a society from its past members (Shoham & Lee, 2018). Scholarship has increasingly used grammatical structures to capture ancestral cultures (Berman et al.,2022; Santacreu-Vasut et al., 2014). In contrast to cultural approaches that capture *modern cultural characteristics* through surveys such as Hofstede and GLOBE, grammatical features of a language relate to *ancestral cultures* – capturing a society's historical heritage and ways of structuring thoughts. Linguistic measures (indicators of core values) can capture phenomena that cultural surveys (indicators of cultural practices) cannot. For example, gendered language is a predictor of gender inequality, including wage inequality (Kleinman, 2002; Prewitt-Freilino et al., 2012), but both GLOBE and Hofstede measures exhibit no significant statistical association with gender wage inequality at the national level (Shoham & Lee, 2018).

Drawing on psychology and neuroscience, IB scholarship now firmly accepts the cultural accommodation effect, which suggests that language priming induces people to modify their thoughts and actions to the ancestral values associated with the language they speak (Akkermans et al., 2010; Tenzer et al., 2017). Currently, grammatical structures capture gender roles, power distances, degrees of collectivism, and future orientations (e.g., Chen & He, 2021; Givati & Troiano, 2012), but they have not been used to understand pro-environmental behavior. To the best of our knowledge, no prior study in ecolinguistics addressed how language diversity affects pro-environmental behavior at the organizational level, a gap that our study aims to fill.

Kashima and Kashima (1998) first highlighted how the explicit use of pronouns in a language brings the actor to the foreground, whereas their drop deemphasizes the actor, stresses reliance on contextual aspects, and fosters collective responsibility. Building on their work, Tabellini (2008) showed that the first pronoun drop is positively associated with high levels of individual social trust, which has long been shown to lead to better collective outcomes (Ben-ner & Putterman, 1998; Fukuyama, 1995). Following these and follow-up studies (e.g., Davis & Abdurazokzoda, 2016; Jayakody et al., 2024), we contend that the first pronoun drop fosters collective responsibility and individual trust, which predispose speakers towards higher levels of societal cooperation for protecting the natural environment. Hence, MNEs from countries with a predominant language that uses the first pronoun drop may be more environmentally responsible than their counterparts in other societies. Therefore:

Hypothesis 1 Firms located in societies with a dominant language that allows the first pronoun drop tend to exhibit better environmental performance.

Language and the relationship between CSR and CPA

MNEs actively engage in CPA to gain competitive advantages. While in the past, some MNEs in so-called 'dirty' industries used lobbying to mitigate the impact of environmental policies (e.g., Cho et al., 2006), we hypothesize that nowadays, those MNEs that dedicate more resources to lobbying are also more proactive on environmental issues. MNEs nowadays place substantial importance on environmental issues such as climate change (Doh, Budhwar, & Wood, 2021; Sun et al., 2021). Indeed, it has long been noted that stakeholder and reputational concerns in both host and home countries put much more pressure on MNEs to exhibit environmental responsibility than domestic firms (Christmann, 2000; Zyglidopoulos, 2002). MNEs pursue environmentally responsible policies in emerging markets, even when they are not forced to do so within a host country's institutional environment (e.g., Casanova & Miroux, 2022; Tatoglu et al., 2020). Scholarship also demonstrates that institutions assign higher standing to MNEs that they perceive to be environmentally responsible (e.g., de Castro, 2021; Ge, Jiang et al., 2016), which can also be helpful for the success of further lobbying efforts stemming from different issues. Studies increasingly suggest that MNEs with a strong CSR record are more likely to engage in CPA (e.g., Eun et al., 2023; Grey, 2018).

Scholarship provides evidence that CPA varies according to national culture (Barron, 2011; Brown et al., 2018); likewise, we suggest that language – and specifically the first pronoun drop – affects CPA (Kashima & Kashima, 1998; Yu et al., 2016). As discussed earlier, the first pronoun drop has been associated with collective responsibility and individual trust. Legitimacy is more difficult to achieve in societies exhibiting collective responsibility due to the complex nature of their informal institutions (e.g., Lewellyn, 2017). At the same time, a few studies suggest that, in societies with high levels of trust, voters are more likely to punish elected officials who are known to have participated in non-ideological misdeeds (Stella & Tabellini, 2007; Tabellini, 2008), arguably receiving funds from MNEs lobbying against environmental policies could be considered as such misdeeds. Hence, the potential beneficial influences of lobbying for MNEs operating in such contexts decrease compared to those obtainable in societies where lobbying is viewed through the lens of the individual organization's competitiveness rather than through a societal (or cooperative) one (Barron, 2011).

Therefore:

Hypothesis 2a Firms that allocate greater resources to CPA tend to have better environmental performance.

Hypothesis 2b First pronoun drop usage in a society negatively moderates the influence of CPA on a firm's environmental performance.

Methods

Sample

We used the Refinitiv-ESG database widely used in research (e.g., Dai et al., 2021). Removing observations without the independent or main controls resulted in an unbalanced sample of 4454 company-year observations[1] of 951 MNEs from 52 industries in 44 countries from 2002 to 2019.

Empirical model

To test our hypotheses, we employed multivariate OLS regressions specified in Eq. (1) for Hypothesis 1, Eq. (2) for Hypothesis 2a, and Eq. (3) for Hypothesis 2b.

$$\begin{aligned}&\text{Environmental Performance}_{i,t}\\&= \alpha + \beta_1 \text{first pronoun drop}_c + \beta_2 \text{Company Level Controls}_{i,t-1}\\&+ \beta_3 \text{Country Level Controls}_{\text{i, t}-1} + \sum_{t=2003}^{2019} \gamma_t \text{Year}_{\text{t}}\\&+ \sum_{j=1}^{52} \delta_j \text{Industry}_j \end{aligned} \quad (1)$$

$$\begin{aligned}&\text{Environmental Performance}_{i,t}\\&= \alpha + \beta_1 \text{Log}(CPA)_{i,t-1} + \beta_2 \text{Company Level Controls}_{\text{i, t}-1}\\&+ \beta_3 \text{Country Level Controls}_{i,t-1} + \sum_{t=2003}^{2019} \gamma_t \text{Year}_t\\&+ \sum_{j=1}^{52} \delta_j \text{Industry}_{\text{j}} + \sum_{c=1}^{44} \phi_c \text{Country}_C \end{aligned} \quad (2)$$

$$\begin{aligned}&\text{Environmental Performance}_{i,t}\\&= \alpha + \beta_1 \text{Log}(CPA)_{i,t-1} \times \text{first pronoun drop}_c\\&+ \beta_2 \text{Log}(CPA)_{i,t-1} + \beta_3 \text{first pronoun drop}_c\\&+ \beta_4 \text{Company Level Controls}_{i,t-1}\\&+ \beta_5 \text{Country Level Controls}_{i,t-1}\\&+ \sum_{t=2003}^{2019} \gamma_t \text{Year}_t + \sum_{j=1}^{52} \delta_j \text{Industry}_j + \sum_{c=1}^{44} \phi_c \text{Country}_{\text{C}} \end{aligned} \quad (3)$$

[1] As the data availability varied across hypotheses, the sample size changes (e.g., 3875 company-year observations for "Lobbying-contribution" and 4454 observations for "Political-contribution").

Table 1 List of countries

Country	Freq.	First pronoun drop allowed	Country	Freq.	First pronoun drop allowed
Australia	203		Japan	87	+
Austria	8		South Korea	91	+
Belgium	13		Luxembourg	3	
Brazil	83	+	Malaysia	10	+
Canada	180		Mexico	28	+
Chile	4	+	Netherlands	41	
China	3	+	New Zealand	17	
Colombia	16	+	Norway	13	
Cyprus	1	+	Oman	1	
Czechia	1	+	Philippines	9	+
Denmark	6		Poland	5	+
Finland	64		Portugal	9	+
France	16		Russia	8	
Germany	130		Singapore	11	+
Greece	19	+	South Africa	175	
Hong Kong	18	+	Spain	93	+
Hungary	9	+	Sweden	37	
India	94	+	Switzerland	67	
Indonesia	40		Thailand	16	+
Ireland	48		Turkey	8	+
Israel	27		UK	1622	
Italy	58	+	USA	1062	
			Total	4454	

where i, j, c, and t denote company, industry, country, and year, respectively, all explanatory and control variables lagged by 1 year to deal with potential reverse causality. We double-clustered standard errors (SE) by country and year to control for the possibility that error terms can be correlated.

Dependent variable

Environmental Pillar scores (*Env-scores*) capture a company's commitment and effectiveness towards adopting responsible initiatives and strategies on environmental issues. The *Env-score* ranges from 0 to 100, higher values representing better environmental performance. Online appendix (1) includes a detailed description of the Env-scores.

Independent variables

First pronoun drop

We used the Index of the first pronoun drop developed by Davis & Abdurazokzoda (2016), which utilized the World Atlas of Language Structures, considered the most advanced dataset of linguistic structure. The *First-Pronoun-Drop*

is assigned a value of 1 if the home country's dominant language allows the first pronoun drop and 0 otherwise (see Table 1 for the list of countries).

CPA

We measured the degree of CPAs using two alternative variables: *Political-contributions,* the total amount of political donations by the company, and *Lobbying-contributions,* the total amount of lobbying contributions made by the company. Both variables were log-transformed to mitigate the impact of outliers. We further constructed two binary variables to capture the CPA incidence: *Political-contributions(Yes/No)* were attributed a value of 1 if a company had political contributions in a given year and 0 otherwise, and *Lobbying-contributions(Yes/No)* was set to 1 if a company had devoted lobbying contributions in a given year and 0 otherwise.

Control variables

Company level

Given the board's critical role, we controlled for *Board-size*, *Independent-director-ratio*, and *Dual-CEO*. We also controlled for company size by *Log(Number-of-employees)*, a log-transformed of the total number of employees. Following Melnyk, Sroufe & Calantone (2003), we included *Environment-Mgmt-Team,* which has a value of 1 if a firm has an environmental management system and zero otherwise.[2]

Country level

S&P Sovereign-credit-rating was added because sovereign credit risk was negatively associated with environmental performance (de Boyrie & Pavlova, 2020). Based on Alam and Kabir (2013), we controlled for Log(GDP) and GDP per capita (GDPPC). Given that there exists a high correlation between *GDPPC* and *Sovereign-credit-rating*, we included the residual of *Sovereign-credit-rating* (*Sovereign-credit-rating* (Residual)$_{t-1}$), which was obtained from the side regression of GDPPC$_{t-1}$=a+b*$Sovereign\text{-}credit\text{-}rating_{t-1}$ as a control variable.

Fixed effect (FE)[3]

As corporate environmental activities may be subject to business cycles, we added *year FE. Industry FE is included to control industry-wide shocks by using the TRBC industry classification.* As MNEs from the same country can be affected by common country-level factors, we added *country FE* whenever possible empirically.[4] Detailed definitions of all variables are presented in Table 2.

Analysis

Summary statistics

Table 3 presents the summary statistics, and Table 4 the correlations. On average *Env-score* is 61.15 *ranging* between 0 and 98.85, suggesting that awareness/attention to environmental issues varied significantly. The 12.76 mean of *Log(Lobbying-contributions)* implies that, on average, the political contributions in a year are equivalent to about half a million USD. Interestingly, *Lobbying-contributions(Yes/No)* value is 0.97, while *Political-contributions(Yes/No)* is 0.35, suggesting that lobbying and political contributions capture different aspects of CPAs.

As hypothesized, we found strong and positive correlations between political and lobbying contributions and environmental performance. Interestingly, we found a strong positive correlation (10.1% with $p < 0.01$) between *Env-score* and *First-Pronoun-Drop*, suggesting that MNEs with better environmental performance are clustered in societies with a first pronoun drop. The correlations between political and lobbying contributions are high and significant (35.8% with $p < 0.01$).

Hypotheses testing

Model (1) of Table 5[5] shows that the coefficient of *First-Pronoun-Drop* is 4.269 (p values < 0.001), equivalent to about 7% of the mean of *Env-score*, suggesting that the effect is economically significant, leading to a strong support of Hypothesis 1. In Model (2), the coefficient of *Log(Political-contributions)* is 0.228 (p value <0.001), suggesting that an increase by one standard deviation of 6.19 in *Log(Political-contributions)* leads to *Env-score* to increase by 0.228*6.19 = 1.41 or 2.31% of the mean. We found very similar results with *Log(Lobbying-contributions)* in Model (3), *Political-contributions(Yes/No)* in Model (4), and *Lobbying-contributions(Yes/No)* in Model (5), leading to a strong support of Hypothesis 2a.

[2] When we replace Environment-Mgmt-Team with CSR/Sustainability Committee, we find very similar results.

[3] We did not include firm-FE in our study because time-series variations within firms are at least 50% lower than the variations in the variables over time across firms.

[4] Given that *First-Pronoun-Drop* is time-invariant in a country, we did not include country dummies in regression analysis testing Hypothesis 1. We included country dummies in all regression models to test hypotheses 2a and 2b.

[5] Following Santacreu-Vasut et al. (2014), we do not display coefficients of control variables except for Table 5.

Table 2 Definitions of variables

	Variable	Definition	Source	Predicted sign
(1)	Env-score	Refinitiv-ESG Environmental Pillar score that covers the categories of Resource Use, Emission, and Innovation, ranging from 0 to 100	Refinitiv-ESG	
(2)	First-Pronoun-Drop	1 if a country's dominant language allows the first pronoun drop and 0 otherwise		+
(3)	Log(Political-contributions)	Natural log of total amount of political donations, support of political candidates, or contributions to parties, as reported by the company, plus 1	Refinitiv-ESG	+
(4)	Log(Lobbying-contributions)	Natural log of the total lobbying contributions made by the company during the fiscal year, plus 1	Refinitiv-ESG	+
(5)	Log(Board-size)	Natural log of the total number of board members at the end of the fiscal year, plus 1	Refinitiv-ESG	+
(6)	Independent-director-ratio	Percentage of independent board members as reported by the company	Refinitiv-ESG	+
(7)	Dual-CEO	1 if the same individual shares the roles of CEO and chair of the board, and 0 otherwise	Refinitiv-ESG	−
(8)	Log(GDP)	Gross Domestic Product of a home country in current US$ tens of millions	World Bank	?
(9)	GDPPC	GDPPC of a home country measured at current US$ tens of thousands	World Bank	?
(10)	Sovereign-credit-rating	Following prior research, credit ratings were computed using a conversion process in which AAA-rated bonds were assigned a value of 22 and D-rated bonds a value of 1	Compustat	−
(11)	Log(Number-of-employees)	Total number of employees as reported by the company in its CSR reporting	Refinitiv-ESG	+
(12)	Environment-Mgmt-Team (Yes/No)	1 if a firm reports to have an Environmental Management system which employees closely monitor, and zero otherwise	Refinitiv-ESG	+

Table 3 Summary statistics

Variable	*N*	Mean	Std Dev	Minimum	Maximum
Env-score	4454	61.15	22.42	0.00	98.85
First-Pronoun-Drop	4454	0.15	0.36	0.00	1.00
$\text{Log(Political-contributions)}_{t-1}$	4454	4.40	6.19	0.00	24.11
$\text{Log(Lobbying-contributions)}_{t-1}$	3875	12.76	2.78	0.00	17.90
$\text{Political-contributions (Yes/No)}_{t-1}$	4454	0.35	0.48	0.00	1.00
$\text{Lobbying-contributions (Yes/No)}_{t-1}$	3875	0.97	0.17	0.00	1.00
$\text{Log(Board-size)}_{t-1}$	4454	2.44	0.27	1.10	3.33
$\text{Independent-director-ratio}_{t-1}$	4454	65.05	21.53	0.00	100.00
Dual-CEO_{t-1}	4454	0.30	0.46	0.00	1.00
Log(GDP)_{t-1}	4454	5.68	1.23	1.18	7.63
GDPPC_{t-1}	4454	4.28	1.62	0.10	11.88
$\text{Sovereign-credit-rating}_{t-1}$	4454	19.98	3.09	3.00	22.00
$\text{Log(Number-of-employees)}_{t-1}$	4454	9.53	1.62	2.94	13.41
$\text{Environment-Mgmt-Team}_{t-1}$	4454	0.73	0.45	0.00	1.00

To test Hypothesis 2b, we used the interaction of *First-Pronoun-Drop* and CPA. As shown in Models (1) ($\beta_1 = -0.285$, p value = 0.022) and (2)($\beta_1 = -0.970$, p value < 0.001) of Table 6, the interaction terms are significantly negative, suggesting that the effect of a CPA on environmental performance is moderated negatively when a firm is operating in a country with first pronoun drop. We found similar results when CPA incidence is considered in Models (3) and (4).

We visualize the interaction effect using 2×2 classification by plotting the predicted value of corporate environment scores at each combination of *High Political-Contribution* (equal to 1 if the political contribution is above its median and 0 otherwise) and *First-Pronoun-Drop*. As illustrated in

Table 4 Correlation

	Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1)	Env-score	1.000					
(2)	First-Pronoun-Drop	**0.101**	1.000				
(3)	Log(Political-contributions)$_{t-1}$	**0.254**	**−0.073**	1.000			
(4)	Log(Lobbying-contributions)$_{t-1}$	**0.125**	**−0.278**	**0.358**	1.000		
(5)	Log(Board-size)$_{t-1}$	**0.311**	**0.196**	**0.229**	**0.102**	1.000	
(6)	Independent-director-ratio$_{t-1}$	**0.154**	**−0.422**	**0.351**	**0.270**	**−0.061**	1.000
(7)	Dual-CEO$_{t-1}$	**0.129**	0.022	**0.353**	**0.264**	**0.187**	**0.208**
(8)	Log(GDP)$_{t-1}$	**0.103**	**−0.245**	**0.460**	**0.328**	**0.069**	**0.369**
(9)	GDPPC$_{t-1}$	**0.109**	**−0.550**	**0.279**	**0.232**	**-0.091**	**0.498**
(10)	Sovereign-credit-rating$_{t-1}$	0.012	**−0.635**	**0.138**	**0.192**	**−0.189**	**0.378**
(11)	Log(Number-of-employees)$_{t-1}$	**0.379**	0.012	**0.311**	**0.332**	**0.332**	**0.155**
(12)	Environment-Mgmt-Team$_{t-1}$	**0.334**	−0.002	**0.172**	**0.187**	**0.129**	**0.104**
	Variables	(7)	(8)	(9)	(10)	(11)	(12)
(7)	Dual-CEO$_{t-1}$	1.000					
(8)	Log(GDP)$_{t-1}$	**0.430**	1.000				
(9)	GDPPC$_{t-1}$	**0.175**	**0.456**	1.000			
(10)	Sovereign-credit-rating$_{t-1}$	0.017	**0.390**	**0.777**	1.000		
(11)	Log(Number-of-employees)$_{t-1}$	**0.193**	**0.195**	**0.057**	**−0.093**	1.000	
(12)	Environment-Mgmt-Team$_{t-1}$	**0.122**	**0.163**	**0.106**	−0.004	**0.192**	1.000

Bold indicates p value < 0.01.

panel A of Fig. 1, the linear plots for both *First-Pronoun-Drop* and *No First-Pronoun-Drop* are upward-sloping, reconfirming that higher political contributions tend to go hand-in-hand with better environmental performance. The slope for *First-Pronoun-Drop* is less steep, suggesting that the positive effect of CPAs on better environmental performance gets attenuated/moderated when MNEs are operating in *First-Pronoun-Drop* favoring home countries rather than in home countries without the *First-Pronoun-Drop*, corroborating the negative coefficient of the interaction term. We found similar graphical evidence for lobbying in panel B.

Endogeneity tests

Propensity score matching (PSM)

Following Shoham, Lee, Khan, Tarba and Ahammad (2020), we utilize PSM to assuage endogeneity concerns. We sorted our sample by the amount of political contributions[6] made by each firm. As our 'treatment' group, we focused on MNEs with political contributions in the highest quartile[7]. Then, using the predicted propensity score estimated in the first-stage logit model, we matched each firm in our treatment group with a firm in the control group with the closest propensity score. Our matching was based on all seven company- and country-level control variables. To evaluate the validity of our matching procedure, we followed Dhaliwal, Judd, Serfling and Shaikh (2016) and conducted three diagnostic tests (see Appendix 2) that demonstrated that MNEs in the two groups differed only in the degree of CPA.

We re-estimated Eq. (2) using PSM. As reported in Models (1) and (2) of Table 7, we continued to find the coefficients of *Log(Political contributions)* (β_1= 0.322, p value = 0.001) and *Political-contributions(Yes/No)* (β_1= 4.406, p value < 0.001) are statistically positive, re-confirming the support for Hypothesis 2a. Next, we re-estimated Eq. (3). As reported in Models (3) and (4), the interaction terms were significantly negative, supporting Hypothesis 2b.

Instrumental variable (IV)

Following Hilary and Hui (2009), we estimated 2SLS IV regressions using each firm's political and lobbying contributions in its earliest year as IVs. In the first-stage IV estimation, we regressed subsequent years' Log(Political-contributions) on the earliest-year value of the Log(Political-contributions) with the same control variables and fixed effects used in the baseline models. Model (1) in Table 8

[6] We repeated the same PSM analysis where we replaced *Log (Political contributions)* with *Log (Lobbying contributions)* and found very similar results.

[7] Using the highest quintile, rather than quintile, to define the treatment group did not alter our findings.

Table 5 Effect of local language/CPAs on environmental performance

Multivariate OLS regressions, Env-score=dependent variable	(1)	(2)	(3)	(4)	(5)
First-Pronoun-Drop	4.269 (0.000)				
$Log(Political\text{-}contributions)_{t-1}$		0.228 (0.000)			
$Log(Lobbying\text{-}contributions)_{t-1}$			0.770 (0.000)		
$Political\text{-}contributions\ (Yes/No)_{t-1}$				3.563 (0.000)	
$Lobbying\text{-}contributions\ (Yes/No)_{t-1}$					4.622 (0.020)
$Log(Board\text{-}size)_{t-1}$	10.351 (0.000)	12.039 (0.000)	11.707 (0.000)	11.913 (0.000)	12.174 (0.000)
$Independent\text{-}director\text{-}ratio_{t-1}$	0.044 (0.000)	0.119 (0.000)	0.074 (0.000)	0.118 (0.000)	0.077 (0.000)
$Dual\text{-}CEO_{t-1}$	−1.405 (0.000)	−1.276 (0.072)	−1.795 (0.003)	−1.300 (0.067)	−1.596 (0.008)
$Log(GDP)_{t-1}$	−0.873 (0.000)	−9.683 (0.135)	10.838 (0.257)	−9.622 (0.137)	13.212 (0.156)
$GDPPC_{t-1}$	2.254 (0.000)	1.978 (0.147)	0.326 (0.862)	1.965 (0.149)	−0.351 (0.847)
$Sovereign\text{-}credit\text{-}rating\ (Residual)_{t-1}$	−0.274 (0.001)	0.463 (0.093)	0.458 (0.324)	0.478 (0.083)	0.318 (0.484)
$Log(Number\text{-}of\text{-}employees)_{t-1}$	4.956 (0.000)	5.467 (0.000)	5.103 (0.000)	5.455 (0.000)	5.522 (0.000)
$Environment\text{-}Mgmt\text{-}Team_{t-1}$	14.779 (0.000)	11.177 (0.000)	11.066 (0.000)	11.144 (0.000)	11.284 (0.000)
Constant	−57.227 (0.000)	−22.942 (0.454)	−125.411 (0.016)	−23.163 (0.449)	−136.744 (0.007)
Observations	19,207	4,454	3,875	4,454	3,875
R-squared	0.379	0.461	0.400	0.461	0.394
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Country FE	NO	YES	YES	YES	YES
Adjusted R-square	0.377	0.446	0.383	0.447	0.376

SEs are clustered by country and year. *p* values in parentheses.

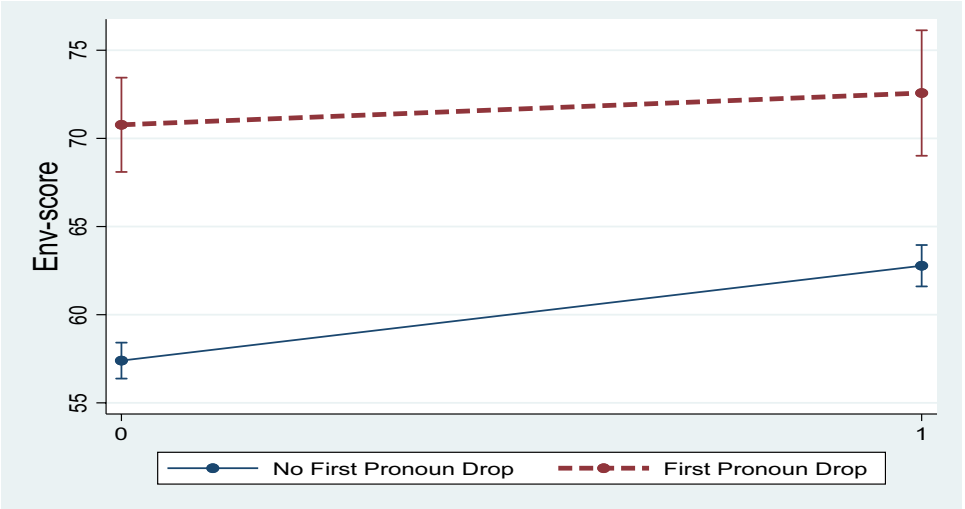
Table 6 Moderating role of local language

Multivariate OLS regressions, Env-score=dependent variable	(1)	(2)	(3)	(4)
$Interaction_{t-1}$	−0.285	−0.970	−11.014	−8.568
	(0.022)	(0.000)	(0.001)	(0.033)
$Log(Political\text{-}contributions)_{t-1}$	0.304			
	(0.000)			
$Log(Lobbying\text{-}contributions)_{t-1}$		0.942		
		(0.000)		
$Political\text{-}contributions(Yes/No)_{t-1}$			4.084	
			(0.000)	
$Lobbying\text{-}contributions(Yes/No)_{t-1}$				6.885
				(0.002)
First-Pronoun-Drop	Subsumed	Subsumed	Subsumed	Subsumed
Constant	−27.469	−127.988	−29.304	−107.913
	(0.362)	(0.014)	(0.339)	(0.031)
Observations	4454	3875	4454	3875
R-squared	0.461	0.402	0.441	0.377
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Adjusted R-square	0.446	0.385	0.426	0.358

SEs are clustered by country and year. *P* values are in parentheses.

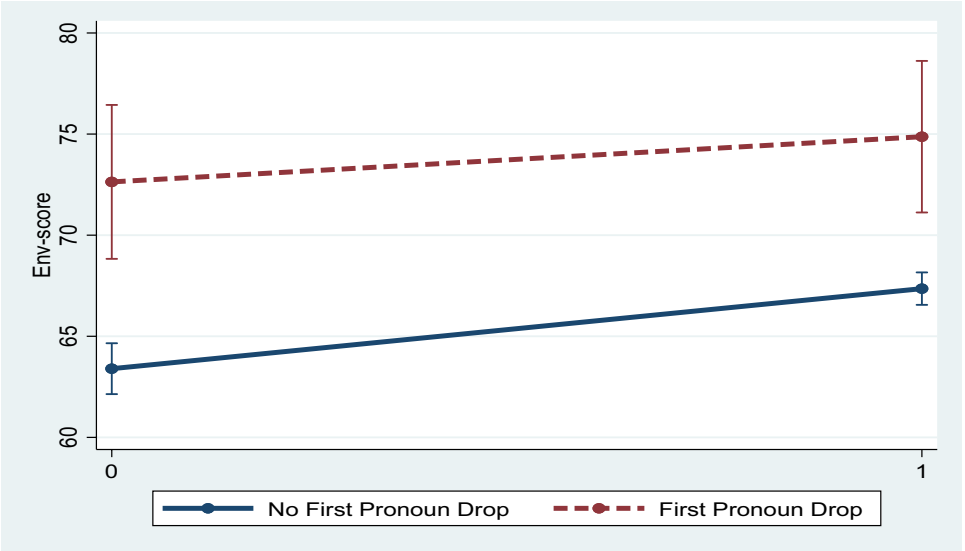
Fig. 1 Moderating role of language

Panel A. Political Contribution



Panel A plots the Env-score at each combination of *High/low Political-Contribution* and *First-Pronoun-Drop*.

Panel B. Lobbying Contribution



Panel B plots the predicted value of corporate environment scores at each combination of *High Lobbying-Contribution* (equal to 1 if the lobbying contribution is above its median and 0 otherwise) and *First-Pronoun-Drop*.

shows that the earliest-year political contributions carry a positive and significant relationship with subsequent political contributions. Model (2) presents the results of the second-stage IV estimations, in which we regressed Env-score on subsequent years' Log(Political-contributions), which is predicted/instrumented from the first-stage IV regressions in Model (1). As evidenced by the significantly positive coefficient of Log(Political-contributions), the results remained robust, confirming that CPAs lead to better corporate environmental performance. When using the earliest value of lobbying contributions as an IV in Models (3) and (4), we found robust results supporting Hypothesis 2a. High IV F-statistics confirmed that neither IV was weak. As evidenced by the weak and even insignificant Durbin *p* value in Models (2) and (4), the Hausman test failed to reject the null hypothesis of exogeneity of the lagged value of Log(Lobbying-contributions), suggesting that the endogeneity issue was not significant.[8]

To ensure our results are robust, we have conducted additional tests, which address causality bias (Online Appendix

[8] Following DeBoskey et al. (2021), as the IVs for each firm, we also computed industry averages of all companies excluding itself in the same industry in the country in which it had operated, for each of the lagged values of *Log (Political-contributions)* and *Log (Lobbying-contributions)* and re-estimated a 2SLS IV estimation. Our logic was that the industry average of the CPAs could affect the degree of CPAs carried out by an individual company operating in the same industry in that country (satisfying the relevance condition) but would not directly affect the same company's environmental performance (satisfying the exclusion condition). We found very similar results.

Table 7 Controlling for endogeneity using PSM

Multivariate OLS regressions, Env-score=dependent variable	(1)	(2)	(3)	(4)
$Interaction_{t-1}$			−0.483	−9.156
			(0.044)	(0.053)
$Log(Political\text{-}contributions)_{t-1}$	0.322		0.377	
	(0.001)		(0.001)	
$Political\text{-}contributions(Yes/No)_{t-1}$		4.406		
		(0.000)		
First-Pronoun-Drop			Subsumed	Subsumed
Constant	30.287	26.040	22.767	16.266
	(0.654)	(0.700)	(0.747)	(0.821)
Observations	1254	1254	1254	1254
R-squared	0.440	0.441	0.414	0.414
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Pseudo R-square	0.390	0.390	0.361	0.361

SEs are clustered by country and year. *p* values are in parentheses.

3), omitted variable bias (Appendix 4), overrepresented English-speaking countries (Appendix 5), controlling for the other form of CPAs (Appendix 6), censored model (Appendix 7), nested data (Appendix 8), and potential measurement bias (Appendix 9).

Discussion

Our study is novel in theorizing and empirically establishing a direct relationship between the dominant national language of the MNE and its environmental performance and supports the wider notion that language diversity has a key impact on management decisions in MNEs (Piekkari et al., 2022; Tenzer et al., 2017). We specifically show that using the first pronoun drop is an important factor behind the better environmental performance of MNEs from such societies.

Our study offers a unique perspective by linking language structure with MNE nonmarket strategies. The findings fulfill our expectation that those MNEs that dedicate more resources to CPA are also more proactive on environmental issues, supporting the notion that CSR and CPA are complementary (Hond et al., 2014; Rehbein & Schuler, 2015) rather than substitutes. We found that the first pronoun drop moderates the positive effects of CPAs on environmental performance.

Our findings offer theoretical and managerial implications. As MNEs straddle cross-border institutional multiplicity and linguistic structures form a key part of a country's informal institutions, IB scholarship should incorporate language in research on the performance outcomes of nonmarket strategies adopted by MNEs as well as CSR–CPA interactions at home country, host country, and supranational levels. At the same time, MNE managers must pay greater attention to the neglected role of language in implementing environmental initiatives.

We acknowledge several limitations. First, ecolinguistics scholarship has not yet clearly illuminated a direct causal relationship between the first pronoun drop and environmental responsibility, which calls for further work in comparative linguistics. Second, we have only focused on environmental performance. Future studies could examine the impact of language on other types of nonmarket strategy performance, such as corporate philanthropy or employee safety performance. Third, we focused on broad lobbying and political contributions, whereas future research could compare the impact of environmental lobbying with other types of lobbying. We explain the interrelationship between language structure and cultural channels as well as between CPA and environmental performance; given that we do not test all the mediating mechanisms, we see it as an additional limitation.

Given the centrality of language diversity for MNE management decisions, future studies should pay greater attention to the role of language in nonmarket strategies and environmental performance of MNEs. Scholars could explore how managerial attitudes towards the natural environment and environmental performance vary between MNE subsidiaries that use different languages. Since language diversity influences the behavior of corporate boards (Piekkari, Oxelheim, & Randøy, 2015; Shoham et al., 2020), studies could explore how languages spoken on the board affect

Table 8 Controlling for endogeneity using 2LSL IV

Panel A. Earliest year value of CPAs as IV	(1)	(2)	(3)	(4)
Earliest year value of Log(Political-contributions)	0.608			
	(0.000)			
Predicted Log(Political-contributions)$_{t-1}$		0.539		
		(0.000)		
Earliest year value of Log(Lobbying-contributions)			0.647	
			(0.000)	
Predicted Log(Lobbying-contributions)$_{t-1}$				0.808
				(0.000)
Constant	− 13.232	− 35.951	− 1.248	− 35.439
	(0.000)	(0.000)	(0.024)	(0.000)
Observations	3890	3890	3279	3279
R-squared	0.672	0.410	0.531	0.356
Controls	YES	YES	YES	YES
Year FE		YES		YES
Industry FE		YES		YES
IV F-stat		2426		1458
Durbin *p* value		0.0101		0.650
Panel B. Residual value of Env-score as IV	(1)	(2)	(3)	(4)
Residual value of Env-score$_{t-1}$	0.009			
	(0.025)			
Predicted Log(Political-contributions)$_{t-1}$		111.986		
		(0.024)		
Residual value of Env-score$_{t-1}$			0.011	
			(0.000)	
Predicted Log(Lobbying-contributions)$_{t-1}$				93.503
				(0.000)
Constant	− 23.032	2,544.419	1.850	− 198.532
	(0.000)	(0.027)	(0.002)	(0.003)
Observations	4454	4454	3875	3875
R-squared	0.442		0.295	
Controls	YES	YES	YES	YES
Year FE		YES		YES
Industry FE		YES		YES
IV F-stat		5.005		20.41
Durbin *p* value		0		0

p values are in parentheses.

MNE environmental engagement. As some MNEs, such as Japan's Rakuten and France's Sodexo, have changed their official corporate language, it would be instructive to explore to what extent such a move has implications for environmental performance. Within this context, it would be important to understand the relative significance of the MNE's language used vis-à-vis the MNE's organizational culture. We hope that our study will stimulate more research utilizing a language perspective on the sustainability performance of MNEs.

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Amir Shoham is Research Professor in the Finance and Management Departments at the Fox School of Business. His primary area of research centers around the impact of linguistic structures on business and society. Amir's research has recently been published in various reputable journals, including *JIBS*, *JBV*, *HRM*, *JOB*, and *JWB* among others. Amir has been recognized for his contributions to gender awareness in IB research, having received the SSE/WAIB Award twice and other accolades.

Jedrzej George Frynas is Professor of Strategic Management at the Open University Business School, UK. He published extensively on topics in nonmarket strategy and international business and has a passion for research on developing/emerging economies. His empirical work has focused on emerging economies such as Nigeria, Brazil, and China. He has published five books and around 50 academic articles in various journals including *SMJ*, *JOM*, *IJMR*, and *CMR*.

Ahmad Arslan is Professor in the Department of Marketing, Management and International Business, University of Oulu, Finland. He is also affiliated with InnoLab, University of Vaasa, Finland, and is Honorary Chair at the Business School, University of Aberdeen, Scotland, UK. His papers have been published in academic journals like the *British Journal of Management*, *Human Resource Management (US)*, *Journal of Organizational Behavior*, *Journal of Product Innovation Management*, and *Public Management Review*.

Ofra Bazel-Shoham is Research Associate Professor at the Fox School of Business, Temple University. Her main research focuses on gender in the business environment. The research investigates gender diversification in executive suites and boards and its impact on firms and multinationals. Her research is motivated by more than 15 years of management experience, in most cases as the sole female in the room. She has published in *JWB*, *JBR*, and *LRP*, among others.

Sang Mook Lee is Associate Professor of Finance in the School of Graduate Professional Studies at the Pennsylvania State University. His research focuses on corporate governance. His work has appeared in the *Journal of Product Innovation Management*, *Long Range Planning*,

Human Resource Management, *Journal of Business Ethics*, *Journal of Corporate Finance*, *Financial Management*, and *International Business Review*.

Zaheer Khan is Professor in Strategy and International Business at the University of Aberdeen, UK. His work focuses on global technology management, platform firms, and internationalization of emerging-market firms. His work has appeared in the *Journal of International Business Studies*, *Journal of World Business*, *Global Strategy Journal*, *International Business Review*, *Human Relations*, and *Journal of Corporate Finance*, among others.

Shlomo Tarba is Chair (Full Professor) in Strategy and International Business at the University of Birmingham, UK. He is a Fellow of the Academy of Social Sciences. He is an Associate Editor of *Journal of Product Innovation Management*, and has served as a Co-Editor-in-Chief of *British Journal of Management*. His papers have been published in *Journal of Management*, *Journal of Product Innovation Management, Journal of Organizational Behavior, Human Resource Management (US), Human Relations,* and *Academy of Management Perspectives.*