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Future-Time Framing: The Effect of Language on Corporate Future Orientation

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Abstract. We examine how international variation in corporate future-oriented behavior, such as corporate social responsibility and research and development investment, could partially stem from characteristics of the languages spoken at firms. We develop a future-time framing perspective rooted in the literatures on organizational categorization and framing. Our theory and hypotheses focus on how companies with working languages that obligatorily separate the future tense and the present tense engage less in future-oriented behaviors, and this effect is attenuated by exposure to multilingual environments. The results based on a large global sample of firms from 39 countries support our theory, highlighting the importance of language in affecting organizational behavior around the world.

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Keywords: language • corporate social responsibility • organizational cognition • R&D investment • corporate future orientation • corporate culture

Introduction

Decades of research on organizational behavior have shown that it varies significantly across countries and regions and is strongly influenced by the socioeconomic environments in which firms operate (Aguilera and Jackson 2010, Guillen 2001, Kostova 1999). Studies in this tradition typically examine how formal and informal institutions shape organizational cognition and behavior, especially through regulative, normative, and cognitive forces (Guler et al. 2002, Kostova and Roth 2002). Although the general link between global institutions and organizational behavior has been widely recognized, existing studies fall short in explaining the cross-country differences in some important yet largely unexplored aspects of organizational behavior, such as how organizations consider time. Research in economics has shown that cross-national variation in people's time horizon affects individuals' behavior (Chen 2013), but to date little is known about how intertemporal trade-offs or cross-national variation in perceiving time horizon affects organizations. Establishing such a link is important given prior research showing the significance of temporal orientation for understanding organizational behavior in general (Flammer and Bansal 2017, Kaplan and Orlikowski 2013).

In this paper, we introduce a new way to think about the underlying mechanisms of international variation in organizational behavior with regard to time by focusing on how such variation could result from organizations' "future-time framing" stemming from characteristics of the languages spoken within organizations across the globe. We define future-time framing as a systematic cognitive tendency in an organization, due to the languages spoken there, that affects how the organization perceives the future. Our framework is supported by recent research in linguistics and economics showing that language use may affect decisions and that a critical difference across languages that may be related to future-oriented behavior is whether they require speakers to grammatically mark future events (Boroditsky 2001, 2011; Chen 2013). For some languages, such as English, grammatically separating the future and the present is mandatory, whereas for other languages, such as German, differentiating between the present and future is optional. The underlying insight is that by having the present and the future in different conceptual categories, obligatory future-time reference (FTR) in a language reduces the psychological importance of—and hence a person's concern for—the future, as it makes the future feel more distant (Dahl 2000, Thieroff 2000). Consistent with these arguments, Chen (2013) finds that strong-FTR speakers save less, retire with less wealth, smoke more, practice less safe sex, and are more obese, after controlling for other well-known cross-national explanatory factors. The conclusion is that speaking in a distinct way about future events

leads individuals to take specific future-oriented actions.

Our theorizing emphasizes that such effects may be even more pronounced when examined at the organizational level, and we develop the idea that future-time framing by a company's dominant language affects whether the firm has a future orientation and prioritizes related practices. The crucial extension of Chen's (2013) proposed individual mechanism is that although within-individual differences are cognitive, decisions within organizations are fundamentally social processes that are negotiated among organizational members (Jarzabkowski 2005, Kaplan 2008b, Whittington 2007). As such, variation in communication and how language is used within the organization in discussion and negotiation processes is essential to understanding how it affects organizational outcomes. Specifically, we argue that as organization members more frequently emphasize the future in daily operations, a cognitive tendency is developed within the organization that induces it to categorize (Durand and Paolella 2013, Glynn and Navis 2013, Porac et al. 1995) the future differently from the present and reinforces the categorization through framing (Cornelissen and Werner 2014, Kaplan 2008b). These processes then lead the organization to insulate its future behaviors or strategies from its current ones. Furthermore, because these processes are developed and reinforced through social interaction, which could potentially shift as organizational membership and operations change, we theorize that such an organization-level cognitive tendency can be "blurred." That is, the categorization of future and present may change as an organization is exposed to multilingual environments such as operating in a more linguistically diverse and more globalized country and having more foreign institutional ownership.

We examine firms' corporate social responsibility (CSR) and research and development (R&D) as examples of their future-oriented behaviors, consistent with prior work from both scholars and practitioners that has argued that CSR and R&D signify the long-term orientation of an organization. To investigate the effects of language, we adopt the FTR criterion from Dahl (2000) and Chen (2013) as our empirical operationalization for "future-time framing," which separates languages into two broad categories: those languages that require future events to be grammatically marked when making predictions and those that do not.

To illustrate, the *World Atlas of Language Structures* (Dryer and Haspelmath 2013) gives an example of the distinction between English, French, and German in describing tomorrow's weather forecast. In German for instance, saying "Tomorrow is cold" is the same as "Today is cold" ("morgen ist es kalt"), while both English and French mandatorily require speakers to put "will" or a future tense ("fera" in French) in the sentence describing tomorrow's situation, i.e., "Tomorrow it will be cold" or "Il fera froid demain." This grammatical difference, as argued by Chen (2013), makes English and French speakers less future-oriented in their preference and behavior relative to German and Finnish speakers. We also use alternative typological classifications of FTR and continuous measures that tap how frequently a language marks the future in its grammar. Our findings—derived from a sample including companies on major equity indices from 39 countries between 1999 and 2014—support our theorizing that companies with a strong-FTR language or a language that more frequently marks the future in its grammar as their working language on average have less of a future orientation.

Our paper makes two main contributions to the research literature. First, our study contributes to understanding how international variation of organizational behavior stems from organization-level cognitive variation with respect to temporal orientation. Though studies in the international organization theory literature suggest that many important organizational practices are deeply influenced by cultural and cognitive forces (e.g., Guler et al. 2002, Kostova and Roth 2002), few have specifically considered the time aspect of these practices (including CSR and R&D) and how they are linked to cognitive schemas at the organizational and country levels. Our conceptualization of future-time framing shows how a language-induced cognitive tendency is not just an important individual process, but because of the social nature of organizational decisions, may even be more powerfully present in organizational behaviors. By drawing on the literatures of organizational categorization (e.g., Durand and Paolella 2013, Glynn and Navis 2013, Porac et al. 1995, Porac and Thomas 1990) and framing (e.g., Eggers and Kaplan 2013, Kaplan 2008a), and linking them to future orientation, we advance the scope and depth of organizational cognition theory. Importantly, reflecting the social nature of organizational decisions, we show that such cognitive tendencies created by future-time framing are malleable by exposure to multilingual environments, suggesting that the relationship between language and organizational cognition is not static and can be reshaped by contextual factors.

Second, our research contributes to the emerging interest in the role of language in management. How language affects intraorganization communication between departments or different levels of hierarchy, as well as across organizations in different countries, has been extensively discussed and theorized (e.g., Cooren et al. 2011, Robichaud et al. 2004, Hinds et al. 2014, Selmier et al. 2015). Some recent studies have begun

to pay attention to how language use can affect corporate strategies, such as cross-border acquisition (e.g., Cuypers et al. 2015) and competitive interactions (Guo et al. 2017). Our study adds a novel aspect to the literature on the relation between language and strategy, by focusing on how a common grammatical structure differentially affects the future orientation of organizations, and by providing systematic evidence from a large international sample. This broader focus helps advance our understanding of how languages fundamentally shape future-oriented corporate strategy, an increasingly important issue for global companies. To our knowledge, our study is among the first in organizational studies to empirically investigate the role of language structures in systematically influencing management practices.

Future-Oriented Framing and Organizational Behavior

Time is a socially constructed variable for organization and human cooperation (Ancona et al. 2001, Bluedorn 2002). Butler (1995, p. 946) claims that "time, as we experience it in the present, can only have meaning in relation to our understanding of the past and *our vision of the future*." In a capitalist economy, various stakeholders orient their activities toward a future that contains uncertainty, and their expectations and framing of the future drive aggregate economic activities and development (Beckert 2016). Although a past–present–future time frame is widely adopted to study many important organizational concepts like learning, risk, imprinting, decision-making, and organizational transformation (Butler 1995, Marquis and Tilcsik 2013, Shi and Prescott 2011), few scholars have incorporated a future orientation into organization theory, constructs, and methods. Below, we review research that has shown that the future orientation of a language affects individuals' economic decisions, as well as the underlying cognitive mechanisms of this relationship. Then, we integrate these insights with the organizational cognition literature focused on categorization and framing, arguing that at the organizational level, the language-induced cognitive tendency is due to the social nature of organizational decision making that involves frequent communication and discussion using certain language structures and meanings. That is, strategic choices of organizations result from how the diversity of experience and background of managers is negotiated within organizations (Jarzabkowski 2005, Kaplan 2008b). We then theorize how these processes would reinforce the tendency, thus making the language effects even stronger within organizations than on individuals, leading to international variation in organizational behaviors with regard to temporal orientation.

The Future Orientation of Languages and Time Perception

Research in linguistics and cognitive psychology shows that languages do not merely express thoughts; the structures of languages also shape the very thoughts that people wish to express. In the linguistics literature, the Sapir–Whorf hypothesis (Whorf 1956) argues that the structure of a language affects the ways in which its speakers conceptualize their world (i.e., their worldview) or otherwise influences their cognitive processes. This hypothesis has a strong version (*linguistic determinism*), which states that the language we speak determines or constrains the way we think and view the real world, and a weak version (*linguistic relativity*), which suggests that our language influences the way we think and view the real world but does not fully determine or constrain it. Though evidence on linguistic determinism is mixed (e.g., Berlin and Kay 1969; Boroditsky 2001, 2011; Kay and Kempton 1984; Yang et al. 2017), a recent wave of psychological and cognitive science research supports linguistic relativism, showing that language profoundly influences how people perceive the world. For example, studies have shown that people find it easier to recognize and remember shades of colors for which their spoken language has a specific name (D'Andrade 1995) and that people's recognition memory was better for the focal colors of their own language than for those of English (Roberson et al. 2004). Experimental studies have also been conducted on bilingual individuals, documenting that speaking different languages can induce different spatial representations and the motion of time (Bylund and Athanasopoulos 2017, Flecken et al. 2015). Furthermore, research has shown that language affects the degree to which people judge events with different degrees of goal orientation (Athanasopoulos and Bylund 2013, Flecken et al. 2014, von Stutterheim et al. 2012) and whether they describe ongoing actions by mentioning endpoints (Athanasopoulos et al. 2015).

A key feature of languages that is relevant to our context is that they differ in whether they require speakers to specify the timing of events, or whether timing can be left unsaid (Dahl 2000, Thieroff 2000). This feature, referred to as "temporal frames of reference," enables speakers to conceptualize time by their use of specific languages (Evans 2013). Dahl (2000, p. 325) develops a criterion to distinguish between languages that are considered "futureless" and those that are not: "futureless" languages are defined as those that do not require "[t]he obligatory use [of grammaticalized future time reference (FTR)] in (main clause) prediction-based contexts." As noted, Chen (2013) empirically showed that there is a strong correlation between weak-FTR languages and future-oriented economic behavior, and that the effect of language is not attenuated when controlling for cultural

and institutional traits. He argues that this is due to the fact that weak-FTR speakers perceive the future as closer. Extending this logic, grammatically requiring speakers to separate the future tense from the present tense (such as in English and French) makes speakers less future oriented in their preferences. To better highlight the underlying cognitive mechanism connecting language and cognition, experimental studies have been conducted on bilingual individuals, documenting that speaking different languages can induce different spatial representations and motion of the concept of time (Bylund and Athanasopoulos 2017, Flecken et al. 2015). Furthermore, research using fMRI analyses, which measure brain activity by examining blood flow, has identified the brain regions in which neural activity is strongly related to discounting time, triggered by different ways of framing intertemporal choices.

Other research in economics and management decision making presents similar arguments on how different perceptions of the present and future affect cognition and behavior. In economics, a fundamental concept is intertemporal discounting, which posits that people usually apply a discount factor when they consider future value: they tend to discount the importance of the future when assigning value to something in the present. In addition, such a discount factor tends to be skewed, meaning that people are more impatient in the near future (Frederick et al. 2002, Glimcher et al. 2007, Monterosso and Luo 2010, Souder and Bromiley 2012). Relatedly, the literature on "mental accounting" and "myopic loss aversion" also suggests that people tend to psychologically separate portfolios into different cognitive categories ("mental accounts"), and their behavior tends to be myopic: primarily focusing on the present account while neglecting the future account (Benartzi and Thaler 1995). These concepts are closely related to corporate and strategic myopia theories advocated by management scholars (e.g., Hambrick and Mason 1984, Laverty 1996), who argue that managers' temporal myopia can lead to corporate short-termism and the neglect of longer-term strategies and initiatives.

Overall, these theories and empirical evidence across a wide array of disciplines are consistent with the notion that individuals vary in how they value future events and that grammatically separating the future from the present may induce speakers to be less future oriented.

The Future Orientation of Organizational Behavior

Although the above research suggests there are important cognitive effects of how the future is expressed in languages, it is not clear how these effects would be translated into organizational behaviors. On the one hand, organizational behaviors can be thought of as simply the sum of individuals' cognitive biases such that variation in future orientation would extend to the organization as such individuals are responsible for making decisions. On the other hand, however, we argue below that because organizational decisions are made through the "ongoing interpretations and interactions of multiple organizational participants in practice and over time" (Kaplan and Orlikowski 2013, p. 990), it is likely that the individual-level cognitive bias would be enhanced at the organizational level. This is because as organization members use different language structures repeatedly, the intraorganizational communication processes, and routines would come to reflect the underlying cognitive bias. In fact, at the organizational level, there may not even need to be a cognitive shift in the constituent individuals as repeated communication in a certain way in and of itself would lead to organizational processes that emphasize the future more or less.

Building on these ideas, we develop the concept of future-time framing as an organization-level cognitive tendency that affects corporate decisions through two interrelated processes: (1) categorization, which refers to the idea that decision makers speaking certain languages may put the future and present into different cognitive categories, and the salience and sharpness of those category boundaries can be altered; and (2) framing, which is the type of communication that leads organizational members to accept one meaning over another—in our context, the importance of the future. As decision makers repeatedly use certain languages structures in formulating and justifying their decisions, such a tendency is reinforced in the organization. Through such a framing process, the language-induced cognitive tendency is rationalized in organizational thinking (Crilly 2016) and becomes dominant through the repeated use of certain language structures and in specific organizational routines (Eggers and Kaplan 2013).

First, conceptual categories, as part of broader classification systems embedded in managerial and organizational cognition, reflect how certain values are coded in organizations' thinking. Prior research on cognitive categories suggests that the way top managers deal with the increasing diversity of strategic decisions in a company depends on those managers' cognitive orientation (Glynn and Navis 2013, Prahalad and Bettis 1986). Studies have also shown how the cognitive categories of managers within organizations enduringly affect strategy and organizational routines (Eggers and Kaplan 2013), and furthermore the extent to which future and present are joined can affect strategic outcomes (Kaplan and Orlikowski 2013). By grammatically marking the future, a language classifies the future and the present in two separate categories for an organization's decision makers. Thus, in some

organizations, information about the present may be more likely to be deemed relevant by the organization and its decision makers at specific times; furthermore, the underlying organizational structures and processes will come to reflect such biases.

Second, this categorization of future and present due to language structure is also built into the organization through frequent communications among organizational members in a specific way of framing. Framing is a quality of communication that leads people in an organization to accept one meaning over another, and it can profoundly affect individual sensemaking in an organization (Weick 1995). The cognitive framing we focus on results from reinforcement via in-group communications with others in an organization, most of whom have "frames of reference" similar to each other (March and Simon 1958), including using the same working language. Through this framing and communication process, individual-level cognitive tendencies are aggregated into collective thinking (Kaplan 2008b). According to Starbuck and Milliken (1988), and relating to our context, by frequently communicating strategies in the same language and in the same way of expression, organizational members (especially managers) comprehend, understand, explain, attribute, and extrapolate future-related events and strategies. All of these processes result in an organization's cognitive tendency toward or against a future orientation.

The above argument is consistent with organizational studies that suggest that decision making is mainly driven by issues that an organization focuses its attention on (Cho and Hambrick 2006; Greve 2008; Ocasio 1997, 2011; Ocasio and Joseph 2005), and an organization focuses its attention mainly on information deemed relevant by a dominant logic, whereas other information is largely ignored (Thornton et al. 2012). Thus, if a future-time categorization is recursively framed and formed as an organizational routine, it should reinforce the organization's logics that the future is distant from today's decisions.

Based on these arguments, we hypothesize that different degrees of future-time framing shaped by different language structures induce different levels of future orientation in organizational communication and decision making, leading to variation in firms' engagement in future-oriented behaviors. Because future-time framing creates a cognitive tendency against a future orientation at the organization level and makes the company pay less attention to information in the "future" category, which is then routinized within an organization, we predict a negative association between speaking a strong-FTR language—one that more frequently uses the future tense—as the dominant language of the organization and its future-oriented behavior.

Hypothesis 1. *Companies with a strong-FTR language as their official language exhibit less future orientation.*

Future-Time Framing and Exposure to Multilingual Environments

We furthermore suggest that the organizational cognitive bias that results from future-time framing is malleable, as the boundaries of cognitive categories can be blurred by exposure to multilingual environments. Prior research argues that perceptual categories are flexible—the boundaries of what is in and out of the categories can change over time and contexts (Porac et al. 1995)—and that situational factors significantly shape where decision makers place their cognitive attention (Ocasio 1997, 2011). As Glynn and Navis (2013) point out, when categorical classifications and boundaries are unclear or in flux (due to using different languages as in our context), the perceiver (decision maker) has few if any benchmarks against which to sort, classify, and assign meaning, which affects sensemaking and action. This "blurring mechanism" suggests that the language FTR effect can be attenuated when the company is more exposed to a multilingual environment. In particular, we examine whether the above effect of language on an organization's future orientation is moderated by the linguistic diversity and globalization of the home country, and by the organization's foreign ownership. Our choice of these moderator variables is motivated by the widely accepted argument that the organizational decisions are influenced by factors at different levels (Miller et al. 1999), allowing us to show whether greater exposure to and use of different languages by the focal firm will attenuate the organizational tendencies with regard to future orientation that result from the repeated use of a single language.

Home Country Linguistic Diversity. Our first moderator is the linguistic diversity of an organization's home country, which refers to the extent to which people in the same country have different mother tongues. In many countries, people from different areas speak distinct languages (e.g., Switzerland, Belgium, and Canada) or different dialects of the same language (e.g., China). Recent research has shown that linguistic diversity in one's home country, an important dimension of within-country heterogeneity, affects people's and organizations' perceptions (e.g., Dow et al. 2016). In particular, home country linguistic diversity exposes speakers and organizations even in the same region to multiple languages throughout their lives. This process can increase the cognitive complexity of the decision makers, thus altering the framing effect of single language use, and moderate the firm's business decisions. Intuitively, greater linguistic diversity makes speakers more flexible with language use, even if different

languages in the home country refer to future-time in a similar way (i.e., fall into the same FTR category), as it would still increase organizations' adaptability to new ways of thinking through discussion and negotiation. These processes will reduce the sharpness and salience of their categorical classifications and boundaries with regard to time. Therefore, we hypothesize that:

Hypothesis 2. *The negative relation between the FTR of a language and corporate future orientation is weaker if the company's home country is more linguistically diverse.*

Home Country Globalization. The language effect can similarly be moderated by a country's globalization, as cross-country linguistic exposure leads to cognitive malleability. First, globalization facilitates the spread of ideas, information, images, and people across different cultures and language backgrounds. It involves more frequent personal contact and communication; information flow via the Internet, television, and newspapers; and the diffusion of cultures and social norms. As a result, people and organizations in more globalized countries have greater exposure to multiple languages in their daily life and operations to accommodate for people speaking different languages, which can blur the boundaries between distinct languages. Second, globalization also brings in international trade and foreign direct investment, which means firms increasingly deal with business partners from different language backgrounds, thus altering the cognitive tendency in organizational decision making due to single language use. In addition, as globalization increases, languages evolve to adopt each other's grammars and ways of expression, which means speakers of different languages increasingly adapt to each other's way of thinking. Companies headquartered in a more globalized environment are more exposed to a multilingual environment with business partners in different countries. Such a multilingual environment makes a manager more flexible to changing perceptual categories and more likely to pay attention to future-related issues than a single-language environment does. We focus on the headquarters country because that is typically the location of a firm's top leaders (Cantwell 2009). If the negative effect of a language's FTR on future-oriented cognition can be moderated by the international exposure of a firm's home country, we hypothesize that:

Hypothesis 3. *The negative relation between the FTR of a language and corporate future orientation is weaker if the company's home country is more globalized.*

Foreign Institutional Ownership. Another way categories become blurred is through interacting with stakeholders outside of the firm, especially institutional investors from foreign countries. We focus on foreign institutional investors, as opposed to other investors or other types of corporate foreign exposure, because they have increasingly become more salient to and active in companies, especially multinationals (Desender et al. 2013). They can influence corporate decisions both through exposing the company to different languages and through their activism in pushing for new values and practices.

First, the focal firm's cognitive structure resulting from the native language spoken can be gradually altered by communicating with its foreign shareholders in foreign languages. For example, a firm often has to use another language to engage with foreign auditors and regulators, to communicate in shareholder meetings, and to translate annual reports. This foreign exposure through professional dialogue and discourse could change the firm's framing about the future and blur the boundary between future and present categories. This process is then routinized and rationalized in its organizational cognition through daily communication (Kuznetsov and Kuznetsova 2014).

Second, foreign institutional investors can bring new views and institutional logic to a firm through activism, which may change the firm's perception about the future and thus its future-related behavior. In addition, more foreign institutional ownership also represents stronger global stakeholder pressures and provides insurance for firm managers against innovation failure, which leads the local firm to focus more on long-term investments (e.g., Bena et al. 2017).

These blurring processes through exposure to foreign institutional investors should reduce the effect of our proposed organizational cognitive tendency against the future among firms with strong-FTR native languages. Therefore, we hypothesize that:

Hypothesis 4. *The negative relation between the FTR of a language and corporate future orientation is weaker if the company has a higher proportion of foreign institutional ownership.*

Methods

We conduct our analysis using both random-effects and fixed-effects models in a panel data set. The empirical operationalization of our future-time framing construct is a language's "future-time reference (FTR)" as termed by Chen (2013) and is a dummy variable indicating whether the firm's official language is a strong- or weak-FTR language. Although language FTR is time-invariant, our dependent and moderator variables and other covariates are mostly time-variant; thus, working with panel models takes these time variations into account. As alternative measures of future-time reference, we also employ FTR classifications with stronger criteria (namely, *Prediction FTR* and *Inflectional*

FTR) and weaker criteria (namely, *Any FTR*), as well as two continuous variables: the *Verb Ratio* and the *Sentence Ratio* based on full-sentence weather forecasts scraped from the Internet and assembled by Chen (2013). These alternative measures, especially the latter two continuous ones, capture not only the tense but also the "aspect" that can indicate the future in a language.[1] Other explanatory variables include the country-level moderating variables *Linguistic Diversity* and *Globalization*, and firm-level moderators *Foreign Institutional Ownership*, as well as their interactions with FTR. For the last moderating variable, it is important to note that even if foreign investors are from a country with its native language being classified as the same FTR as the focal company, the fact that organizational decision makers have to frequently communicate in different languages increases the flexibility of their cognitive ability in adapting to a new language. Empirically, the attenuating effect should be particularly prominent if foreign institutional investors are from weak-FTR language countries, but international data on institutional investors' native languages are impossible to obtain. Therefore, our results without differentiating between strong- and weak-FTR of these investors represent the lower bounds of the attenuating effect. That is, if we still find an attenuating effect of having more foreign institutional holdings in general (without distinguishing whether the foreign institutional investors are from weak-FTR language countries), the results will only be stronger if we further make a distinction on the FTR of these investors' languages.

Following many other cross-country studies that cluster countries into groups, we exclude former and current socialist countries from the regression, mostly due to their particularity in institutional infrastructure and legal traditions (e.g., Beckert 2016, La Porta et al. 1998).

Dependent Variables

Empirically, we use a firm's CSR and R&D as proxies for organizational future orientation, because to implement them, firms must incur short-term costs to benefit from future benefits. For example, recent research emphasizes CSR as being an intertemporal trade-off for business sustainability (Bansal and DesJardine 2014; Slawinski and Bansal 2012, 2015), a strategy to engage nonfinancial stakeholders over the long term (e.g., Greening and Turban 2000, Hillman and Keim 2001, Luo and Bhattacharya 2006, Marquis et al. 2007), and an insurance mechanism against future risks (e.g., Godfrey 2005, Koh et al. 2014). Similarly, R&D is a forward-looking behavior whereby corporations in the present invest in innovation activities that have a future return (Chen 2008, McGrath 1997, Miller and Arikan 2004), and thus it represents a firm's long-term investment orientation (Chrisman and Patel 2012).

Our primary data source for a firm's CSR is Morgan Stanley Capital International's (MSCI) Intangible Value Assessment (IVA) program, which measures a corporation's environmental and social risks and opportunities that refer to issues where companies generate large environmental and social externalities and may be forced to internalize (future) unanticipated costs associated with those externalities in the future. MSCI uses raw data from corporate documents (environmental and social reports, annual reports, securities filings such as 10-Ks and 10-Qs, websites, etc.), environmental groups and other NGOs, trade groups and other industry associations, government databases (e.g., central bank data and U.S. Toxic Release Inventory), periodical searches (e.g., in Factiva and Nexis), and financial analysts' reports to construct the CSR rating for each firm. This is one of the most widely used data sets in studying CSR behavior globally (e.g., Cai et al. 2016, Ferrell et al. 2016, Liang and Renneboog 2017). Companies are rated and ranked in comparison with their industry peers from international markets, and therefore the rating does not depend on the local CSR situations and rules (jurisdictions and regulations). The data are then converted to a relative rating by giving the companies with the best performance (CSR level) *within their industry sector on a global scale* in a given category a AAA (top) rating, giving the companies with the worst performance a CCC (lowest) rating, and pro rata rating the remaining firms between AAA and CCC; we then converted each rating to a score from six to zero. The data cover the well-established equity indices of the largest companies across the world rather than just selecting a specific sample of firms that engage in CSR. For this large sample with global coverage, MSCI constructs a series of 29 CSR ratings for each company, among which a few categories such as *Labor Relations*, *Industry Specific Carbon Risk*, and *Environmental Opportunity* receive the highest weights in the global rating.

Data on R&D investment are obtained from Worldscope, and the variable is calculated as a firm's total R&D expenditures over its total assets, winsorized at 95%. This is a standard way of measuring corporate R&D engagement and aims to capture the uncertainty in future rewards. The measurement has been widely used in the management literature (e.g., Chrisman and Patel 2012). To maintain sample consistency in different estimations, we use the CSR sample from MSCI, and we match firms in this sample with R&D expenditure information. Our main sample comprises more than 5,500 firms from 39 countries and economies (see Online Appendix A) and spans 123 industries based on MSCI's industry classification.

Explanatory Variables

As noted, organizational future-time framing is proxied by the language FTR of the firm, which we obtained

by manually checking the focal firm's headquarters location and the official language of that region. For most companies in our sample, the official languages of the regions in which they are headquartered are the same as their national languages. For companies in countries with multiple official languages, such as Belgium, Switzerland, and Canada, we have taken the language spoken in the region where the firm is located. For these companies, we have manually coded their FTR as the region's FTR. For example, the official language for a Belgian firm located in Flanders, the Dutch-speaking part of Belgium, is coded as "weak-FTR," and the official language for a Swiss firm located in the French- or Italian-speaking region of Switzerland is coded as "strong-FTR."[2] Furthermore, if the region is itself multilingual (e.g., Brussels), we coded the language use by the company based on characteristics of top management and significant investors. This way, we were able to reach high granularity of language FTR within a region/city. For companies based in Canada, such as Montreal (or more broadly in Quebec), the issue does not constitute a problem because both English and French are strong-FTR languages. The classification of strong and weak FTR follows the EURORTYP and Chen's (2013) strong-criterion classification. We also use the aforementioned five alternative measures of language FTR in our robustness tests: (1) Any FTR, which applies a weak criterion identifying the presence of any grammatical marking of future events in a language, even if infrequently used, including both inflectional markers (like the future-indicating suffixes in Romance languages) and periphrastic markers (like the English auxiliary "will"); (2) Inflectional FTR, which applies a stronger criterion that identifies the presence of an inflectional future tense and includes most Romance languages but excludes English; (3) Prediction FTR, which is a subset of overall FTR but restricts the use to prediction-based contexts such as weather forecasts; (4) Verb Ratio, which is a continuous measure that counts the number of verbs that are grammatically future-marked, divided by the total number of future-referring verbs; (5) Sentence Ratio, another continuous measure of the proportion of sentences regarding the future that contains a grammatical future-marker. For the Verb Ratio and Sentence Ratio, Chen (2013) scraped the Internet for full-sentence weather forecasts (which contain relatively homogeneous sets of information about the future) in 39 different languages that are currently available on a large number of websites. Unsurprisingly, these ratios are highly positively correlated in both the sample of Chen (2013) and our sample (Pearson correlation coefficient > 90%).

Moderators

Our first moderator is country-level *Linguistic Diversity*, for which we use Greenberg's (language) Diversity Index that measures the probability that two people selected from the population at random will have different mother tongues, obtained from the UNESCO World Report ("Investing in Cultural Diversity and Intercultural Dialogue"). We obtained data for our second moderator, *Globalization* at the country level, from Eidgenössische Technische Hochschule (ETH) Zürich's KOF Index of Globalization. The KOF index is to date the most widely used index for globalization in the academic literature and policy research, as it comprehensively measures the degrees of a country's global connectivity, integration, and interdependence in the economic, social, technological, cultural, political, and ecological spheres, and it has the broadest coverage on countries. The third moderator is *Foreign Institutional Ownership*, which is the sum of the holdings of all institutions domiciled in a country different from the one in which the stock is listed, divided by the firm's market capitalization; we obtained the data for this variable from the FactSet (Lionshares) database.

Control Variables

The country-level control variables capturing economic and social development include *Legal Origin* (common laws versus civil laws, orthogonalized to our FTR variable), *Rule of Law*, and the logarithm of *GDP Per Capita*. We focus on the countries of firms' corporate headquarters because they are the locations of most senior manager decision makers, and so their external environments likely have the greatest influence on corporate decisions (Sun et al. 2015, Marquis et al. 2016). At the firm level, we control for ownership concentration, proxied by the ownership stakes held by all blockholders who own at least 5% of the firm's free-float shares (*Total Blockholdings*), obtained from Datastream, and cross-validated with other data sources including Orbis and Factset. We also include several indicators of different aspects of firms' financial performance (constraints), including *ROA* and Tobin's *Q*. We furthermore control for CEO characteristics and backgrounds, such as gender and international (work and education) experience, which involved significant manual data collection and cross-validation work (Kulich et al. 2011). For example, *CEO International Experience* is a dummy variable capturing whether the CEO of the focal firm in the focal year had overseas education or work experience in the past; we manually collected these data from the BoardEx online database and Director Reports by first checking who was the CEO in each year of our sample period and then checking whether this person obtained either overseas education or international work experience in the past. Our empirical analysis has a multilevel nature: Although our theory and the key dependent and explanatory variables are at the organizational level, some of our control variables are measured at the

country or individual level. In robustness tests we also control for culture by including Hofstede's six cultural dimensions (power distance index, individualism versus collectivism, uncertainty avoidance index, masculinity versus femininity, normative versus pragmatic, and indulgence versus restraint). Finally, we control for time fixed effects and industry fixed effects. As a robustness check, we also control for country fixed effects, which of course comes with a caveat that the identified FTR effect comes only from countries that have two or more languages with different FTR, such as Belgium and Switzerland.

Our sample's country coverage, the official languages, and their FTR are shown in Online Appendix A. More detailed descriptions of one of our key dependent variables, CSR ratings, are provided in Online Appendix B and of our independent variables are in Online Appendix C. (The definition of R&D is standard so we do not describe it in detail.) Table 1 shows the means and standard deviations of our independent variables, as well as their correlations. Few of them are highly correlated, especially with language FTR, which largely reduces potential multicollinearity concerns. Moreover, standard errors in all regressions are clustered at the firm level.

Results

In this section, we report results from our empirical analyses. We first show the baseline results with CSR (using the MSCI IVA rating) and R&D as the dependent variables, and we highlight the main effects and interaction effects with moderators of language FTR in Table 2. When using CSR as the dependent variable, our sample size has 88,774 firm-time observations, determined by the composition of the MSCI IVA sample, which comprises companies from the MSCI World Index, the MSCI Emerging Markets Index, the FTSE 100 and the FTSE 250, and the ASX 200. In other words, our sample consists of large firms from major global equity indices. When using R&D as the dependent variable, the sample size becomes 54,902 as we further require nonmissing R&D observations based on the MSCI IVA sample.

Baseline Results

We first test the main effect of language FTR (Models 1 and 5), and one moderator is tested in each specification (Models 2–4 and 6–8). The coefficients on FTR for all specifications are negative and statistically significant above the 99% confidence level, indicating a strong negative correlation between language FTR and corporate future orientation as proxied by CSR and R&D. And the economic significance is nontrivial: companies in regions with strong-FTR languages as their official/working languages on average engage less in CSR by 7% ($\beta = -0.159$, p-value = 0.000) and in R&D by 40.6% ($\beta = -0.446$, $p = 0.000$). These results support Hypothesis 1 that, conditional on other things being equal, companies in regions with strong-FTR languages on average engage less in future-oriented behavior such as CSR and R&D investments.

Second, turning to the tests of our moderator variables in Models 2–5 and 7–10, the interactions of FTR with *Linguistic Diversity* (country-level), *Globalization* (country-level), and *Foreign Institutional Ownership* (firm-level) are all positive and statistically significant above the 95% level. For example, a one-standard-deviation increase in a country's linguistic diversity is related to more than a one-standard-deviation decrease in the negative effect of FTR on CSR [$(1.320 \times 0.204)/(0.519 \times 0.43)$] and on R&D [$(2.244 \times 0.204)/(1.023 \times 0.43)$]. In other words, the negative effect of future-time framing can be completely offset when the firm is headquartered in a linguistically diverse country, supporting our Hypothesis 2. Similarly, the attenuating effect of country globalization on FTR is about 26% for CSR and 24% for R&D, and that of foreign institutional ownership on FTR is about 85% for CSR and 15% for R&D.[3] These results largely support Hypotheses 3 and 4. The magnitudes of the attenuating effects of linguistic diversity are the largest, which is reasonable given that both globalization and foreign institutional ownership capture some other dimensions than language, whereas linguistic diversity is almost entirely about language effect. We also plot the graphical representations of these moderating effects in the online appendix.

Third, we show in Online Appendix Table D.1 that when we replace CSR or R&D with the logarithm of patents or citations as the dependent variable using data from Hsu et al. (2017), we obtain very similar results for the effects of both FTR and the three moderators. Given the consistency of our results using different DVs, to save space, we only report CSR and R&D in subsequent tables.

Alternative Measures of Future-Time Reference

Fourth, we replace the original FTR dummy (strong criterion) with five alternative measures of FTR: (1) Any FTR, (2) Inflectional FTR, (3) Prediction FTR, (4) Verb Ratio, and (5) Sentence Ratio, as coded by Chen (2013). These alternative FTR measures are highly correlated with the original FTR measure that we use in Table 2 (see Online Appendix Table E.1 for the correlations), though they measure different aspects of language future reference. A caveat is that except for "Any FTR," alternative FTR measures do not have the coverage that is as broad as the original FTR, and the coverage for Any FTR is the broadest among all our measures. We report the results of using these alternative measures in Online Appendix Table E.2. We find that the lower the percentage of verbs and sentences that are grammatically future-marked, the higher are

Table 1. Summary Statistics and Correlations

	Variable	Observations	Mean	Standard deviation	Minimum	Maximum	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1)	*CSR*	88,774	2.9537	1.6629	0	6	1							
(2)	*RD/assets* (winsorized)	54,902	0.3594	0.9276	0	3.61406	0.0691*	1						
(3)	*FTR*	108,964	0.7488	0.4337	0	1	−0.0967*	−0.4268*	1					
(4)	*Linguistic diversity*	108,964	0.2744	0.1730	0.003	0.758	−0.0973*	−0.4700*	0.3186*	1				
(5)	*Globalization*	108,964	77.7580	7.4217	52.67	92.37	0.1777*	−0.5531*	0.2762*	0.4068*	1			
(6)	*Foreign institutional ownership*	108,964	0.1323	0.1147	0	0.9998	0.1256*	−0.0270*	−0.1444*	0.0684*	0.2940*	1		
(7)	*CEO international experience*	108,964	0.3030	0.4596	0	1	0.1006*	−0.0581*	−0.0472*	0.0858*	0.2325*	0.1739*	1	
(8)	*CEO gender*	108,964	0.0198	0.1394	0	1	0.0339*	−0.0291*	0.0162*	0.0135*	0.0486*	0.0101*	0.0656*	1
(9)	*Rule of law*	108,964	9.3470	1.0240	2.0833	10	−0.0108*	−0.2801*	0.1164*	0.3072*	0.2383*	−0.1125*	−0.1478*	0.0262*
(10)	*English common law* (orthogonalized)	108,964	−0.0358	0.3967	−1.0317	0.9382	−0.1471*	−0.2341*	0.5544*	0.1354*	0.0241*	−0.2454*	−0.1527*	0.0337*
(11)	Ln(*GDP per capita*)	108,964	10.6526	0.3369	7.9502	11.5409	0.0512*	−0.2070*	0.0980*	0.1249*	0.2466*	0.0185*	−0.1067*	0.0346*
(12)	Ln(*Total assets*)	108,964	9.4870	1.9456	2.6469	19.5031	0.0948*	0.0151*	−0.2147*	−0.0308*	−0.2366*	0.0384*	0.0393*	−0.0024
(13)	Tobin's *Q* (winsorized)	108,964	1.7051	0.8593	0.8789	4.2607	−0.0485*	−0.1685*	0.1462*	0.0864*	0.0368*	−0.0125*	−0.0143*	0.0038
(14)	*ROA* (winsorized)	108,964	0.2830	0.8573	−0.0833	4.27	−0.0526*	−0.0567*	0.0984*	0.1351*	0.0229*	0.0337*	−0.0350*	−0.0353*
(15)	*Total blockholdings*	108,964	0.2411	0.2198	0	0.97	−0.0468*	−0.1142*	0.0713*	0.1059*	0.1201*	−0.1999*	0.0741*	0.0035
(16)	*Power distance index*	108,926	43.2773	11.5358	11	104	−0.0354*	0.3429*	−0.1266*	−0.0881*	−0.4053*	−0.0345*	0.0538*	−0.0399*
(17)	*Individualism*	108,926	76.7762	19.2717	13	91	−0.0337*	−0.5562*	0.6407*	0.3484*	0.4293*	−0.1310*	−0.1045*	0.0368*
(18)	*Masculinity*	108,926	61.7435	17.9610	5	95	−0.0937*	0.4339*	−0.2126*	−0.3400*	−0.6057*	−0.2061*	−0.1625*	−0.0619*
(19)	*Uncertainty avoidance index*	108,926	56.5811	20.1978	8	112	0.0275*	0.5363*	−0.4636*	−0.2814*	−0.4807*	0.0383*	0.0354*	−0.0481*
(20)	*Normative vs. pragmatic*	108,926	45.6838	23.7023	13	100	0.1457*	0.5243*	−0.6985*	−0.4095*	−0.2639*	0.1589*	0.0929*	−0.0477*
(21)	*Indulgence vs. restraint*	108,563	61.2590	12.4444	29	97	−0.0553*	−0.5101*	0.4680*	0.2761*	0.4113*	−0.0503*	−0.0460*	0.0527*

		(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(9)	*Rule of law*	1												
(10)	*English common law* (orthogonalized)	0.3008*	1											
(11)	Ln(*GDP per capita*)	0.7260*	0.1860*	1										
(12)	Ln(*total assets*)	−0.1876*	−0.2290*	−0.1640*	1									
(13)	Tobin's *Q* (winsorized)	0.1268*	0.1647*	0.0645*	−0.3879*	1								
(14)	*ROA* (winsorized)	0.0892*	0.0581*	0.0336*	0.0545*	0.0339*	1							
(15)	*Total blockholdings*	−0.1849*	−0.0830*	−0.2891*	−0.1180*	0.0624*	−0.0098*	1						
(16)	*Power distance index*	−0.4784*	−0.3788*	−0.5908*	0.2697*	−0.1282*	−0.0529*	0.1168*	1					

Table 1. (Continued)

	Variable	Observations	Mean	Standard deviation	Minimum	Maximum	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(17)	*Individualism*	0.6606*	0.6312*	0.5666*	−0.3555*	0.2176*	0.1059*	−0.0664*	−0.6266*	1				
(18)	*Masculinity*	−0.0369*	0.1522*	0.0409*	0.0645*	−0.0602*	−0.0287*	−0.1634*	0.1113*	−0.1684*	1			
(19)	*Uncertainty avoidance index*	−0.3958*	−0.6470*	−0.3397*	0.3362*	−0.2249*	−0.0783*	0.0132*	0.6851*	−0.7925*	0.3404*	1		
(20)	*Normative vs. pragmatic*	−0.4279*	−0.6626*	−0.2344*	0.3110*	−0.2288*	−0.1270*	−0.0135*	0.3825*	−0.7249*	0.3486*	0.6851*	1	
(21)	*Indulgence vs. restraint*	0.4678*	0.6048*	0.3450*	−0.3668*	0.2312*	0.0707*	−0.0521*	−0.5762*	0.7509*	−0.3169*	−0.8432*	−0.7636*	1

*$p < 0.05$.

the CSR ratings and R&D ratio. The estimated effects are economically similar to those in Models 1 and 6 of Table 2. For example, a one-standard-deviation reduction in Verb Ratio (–34.34%) is associated with a 5.7% increase (–0.166 × –34.34%) in CSR and 24.4% increase (–0.710 × –34.34%) in R&D expenditure. A one-standard-deviation decrease in Sentence Ratio (–37.60%) corresponds to a 7.6% increase (–0.202 × –37.60%) in CSR and 22% increase (–0.584 × –37.60%) in R&D expenditure. In addition, the interaction terms capture similar effects and significance. In unreported results, we also test the interaction effects of these alternative measures of FTR, and the previous results hold. Therefore, our previous conclusion of a significant relationship between future-time framing and organizational future orientation is further upheld when we consider alternative (both dichotomous and continuous) measures of language structure. Given the consistent results using various measures of FTR, we use the original FTR measure (strong criterion) as used in Chen's (2013) published version in all subsequent tests.

Cross- and Within-Country Analysis

Controlling for Country Fixed Effects. We control for country fixed effects to rule out concerns about alternative country-level processes that could endogenously affect our results. Country fixed effects take into account all unobservable time-invariant country-level factors that can drive organizational future orientation. This approach inevitably excludes all our time-invariant country-level variables such as linguistic diversity, cultures, and legal origins (it should be noted that FTR is not omitted because it is measured at the regional/firm level), and it comes with a caveat that our identified effects will be mainly from countries that have two or more different FTR languages. We replicate the tests as in Table 2 but with country fixed effects included in regressions, and we report the results in panel A of Table 3. From these results, we conclude that the significance of the interaction terms remains when applying this stringent test of including country fixed effects, and the significance of FTR becomes even stronger both statistically and economically.

Weak- and Strong-FTR Languages Within One Country. We also investigate within-country variation in future-time framing by focusing on the subsample of firms located in the two countries in which both strong- and weak-FTR languages are present.[4] Belgium has three official languages: Dutch, French, and German, with Dutch and German classified as weak-FTR languages and French as a strong-FTR language. Switzerland has four official languages: German, French, Italian, and Romansh. Three of them are classified as strong-FTR languages: French, Italian, and Romansh. These two countries therefore provide an

Table 2. Main Results

	DV = CSR				*DV = R&D/Assets*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FTR (Hypothesis 1)	−0.159***	−0.519***	−1.005***	−0.308***	−0.446***	−1.023***	−2.060***	−0.486***
	(0.0583)	(0.0944)	(0.383)	(0.0644)	(0.0312)	(0.0522)	(0.152)	(0.0321)
FTR × *linguistic diversity* (Hypothesis 2)		1.320***				2.244***		
		(0.273)				(0.163)		
FTR × *globalization* (Hypothesis 3)			0.0112**				0.0212***	
			(0.00500)				(0.00196)	
FTR × *foreign institutional ownership* (Hypothesis 4)				0.971***				0.275***
				(0.178)				(0.0551)
Linguistic diversity	−1.625***	−2.413***	−1.575***	−1.606***	−1.130***	−2.096***	−1.054***	−1.116***
	(0.127)	(0.206)	(0.129)	(0.127)	(0.0791)	(0.105)	(0.0787)	(0.0781)
Globalization	0.0515***	0.0573***	0.0463***	0.0520***	−0.0402***	−0.0352***	−0.0462***	−0.0403***
	(0.00279)	(0.00304)	(0.00363)	(0.00279)	(0.00107)	(0.00113)	(0.00119)	(0.00106)
Foreign institutional ownership	0.920***	0.908***	0.910***	0.258*	0.0937***	0.0979***	0.114***	−0.0634
	(0.0876)	(0.0876)	(0.0877)	(0.149)	(0.0301)	(0.0300)	(0.0301)	(0.0435)
CEO international experience	0.0399**	0.0423***	0.0395**	0.0389**	0.000520	0.00332	0.000732	−1.18e-05
	(0.0155)	(0.0155)	(0.0155)	(0.0155)	(0.00573)	(0.00573)	(0.00573)	(0.00573)
CEO gender	0.199***	0.200***	0.200***	0.201***	−0.0364*	−0.0333*	−0.0373*	−0.0372*
	(0.0483)	(0.0482)	(0.0482)	(0.0482)	(0.0195)	(0.0195)	(0.0195)	(0.0195)
Rule of law	−0.0709***	−0.123***	−0.0696***	−0.0648***	−0.200***	−0.292***	−0.201***	−0.196***
	(0.0226)	(0.0250)	(0.0226)	(0.0226)	(0.0120)	(0.0137)	(0.0119)	(0.0119)
English Common Law (orthogonalized)	−0.317***	−0.254***	−0.334***	−0.331***	−0.360***	−0.342***	−0.393***	−0.368***
	(0.0566)	(0.0581)	(0.0570)	(0.0567)	(0.0299)	(0.0298)	(0.0299)	(0.0298)
Ln(*GDP per capita*)	0.439***	0.468***	0.431***	0.433***	0.0352**	0.0727***	0.0146	0.0277*
	(0.0429)	(0.0433)	(0.0430)	(0.0429)	(0.0152)	(0.0154)	(0.0153)	(0.0153)
Ln(*Assets*)	0.0501***	0.0496***	0.0516***	0.0504***	−0.358***	−0.359***	−0.355***	−0.358***
	(0.00440)	(0.00440)	(0.00445)	(0.00440)	(0.00151)	(0.00151)	(0.00154)	(0.00151)
Tobin's *Q* (winsorized)	0.000669	0.00191	0.00169	−0.000258	−0.0531***	−0.0523***	−0.0516***	−0.0532***
	(0.00947)	(0.00947)	(0.00948)	(0.00947)	(0.00283)	(0.00283)	(0.00284)	(0.00283)
ROA (winsorized)	0.00105	0.000497	0.00159	0.00140	−0.00443	−0.00490*	−0.00380	−0.00420
	(0.0100)	(0.0100)	(0.0100)	(0.0100)	(0.00293)	(0.00293)	(0.00293)	(0.00294)
Total blockholdings	−0.0806**	−0.0768**	−0.0807**	−0.0907**	−0.0391***	−0.0439***	−0.0249**	−0.0338***
	(0.0388)	(0.0388)	(0.0388)	(0.0388)	(0.00989)	(0.00988)	(0.00997)	(0.00995)
Constant	−3.640***	−3.738***	−3.227***	−3.585***	8.713***	9.000***	9.307***	8.764***
	(0.596)	(0.596)	(0.624)	(0.596)	(0.211)	(0.211)	(0.217)	(0.210)
Observations	88,774	88,774	88,774	88,774	54,902	54,902	54,902	54,902
Time and industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. Standard errors in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

interesting setting to examine the effect of language within a single country. If we still observe similar patterns of CSR across different regions within the same country, we are more likely to pick up a pure language effect rather than country-specific effects.

The results from this within-country analysis based on Belgian and Swiss firms are reported in panel B of Table 3 and again reinforce our earlier conjectures on the future-time framing effects due to language use. The coefficient on FTR is negative and significant, and its economic magnitudes are again nontrivial; for example, firms in a weak-FTR region engage 11% ($0.714 \times 0.43/2.76$) more in CSR, although the difference in R&D appears to be much smaller. This within-country result further eliminates the concern that the observed correlation between language future-time framing and corporate future orientation is driven by other country-level factors such as legal origins, institutions, and regulations, as these other variables do not have significant within-country variations.

Robustness Checks

We also conduct various other robustness tests using alternative samples and specifications, as well as taking into consideration the effects of cultures and religions. For conciseness, in these robustness tests we report only the main effects of FTR rather than their interactions with moderating variables and other control variables, but their effects are mostly upheld.

Subsample Analysis. First, we conduct our analysis on subsamples of only European languages, both in a narrowly defined way (only Germanic and Romance languages, as in Model 1 in panels A and B of Online Appendix Table F.1) and in a broadly defined way (Germanic, Romance, Slavic, Baltic, Greek, and others, as in Model 2 of the two panels of Online Appendix Table F.1). The previous conclusions still hold.

Second, we exclude U.S. firms from our sample, as they represent more than 30% of our sample firms and thus one may be concerned that our results are driven by U.S. firms (Model 3 in panels A and B of Online Appendix Table F.1). In addition, we exclude Scandinavian countries from our sample to eliminate the concern of a "Scandinavian effect," as Scandinavian firms have high levels of CSR and innovation capacities (Liang and Renneboog 2017) (Model 4 in the two

Table 3. Country Fixed Effects and Within-Country Analysis

Panel A: Controlling for country fixed effects

	DV = CSR				*DV = R&D/Assets* (winsorized 5%)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FTR (Hypothesis 1)	–0.501***	–1.198***	–3.305***	–0.549*	–0.235***	–0.396**	–3.963***	–0.282***
	(0.151)	(0.370)	(0.507)	(0.309)	(0.0505)	(0.197)	(0.164)	(0.0881)
FTR × *Linguistic Diversity* (Hypothesis 2)		1.267**				0.434		
		(0.615)				(0.513)		
FTR × *Globalization* (Hypothesis 3)			0.0358***				0.0444***	
			(0.0062)				(0.0019)	
FTR × *Foreign Institutional Ownership* (Hypothesis 4)				0.577**				0.153***
				(0.241)				(0.0540)
Observations	170,035	170,035	170,035	170,035	88,958	88,958	88,958	88,958
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Within-country analysis: Belgium and Switzerland

	DV = CSR		*DV = R&D/Assets* (winsorized 5%)	
	(1)	(2)	(3)	(4)
FTR	–0.714**	–0.378***	–0.0071***	–0.0207***
	(0.323)	(0.0516)	(0.0019)	(0.0017)
Observations	2,992	4,523	2,629	2,959
R^2	0.096	0.023	0.823	0.730
Control variables	Yes	No	Yes	No
Time FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

Note. Standard errors in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

panels). Again, the coefficient on FTR is negative and significant, with a similar magnitude as before.

Third, a potential concern is whether our language variables simply capture the effect of religious beliefs, such as Protestant versus Catholic, which are believed to shape the values and norms in a society and have been documented as an important factor in influencing economic behavior (e.g., Arruñada 2010, Renneboog and Spaenjers 2012). We therefore address this concern by including a religion variable—the percentage of Protestants in the population—as well as interacting it with FTR in regressions (Model 5 of Online Appendix Table F.1). We find that religion has an impact on corporate future orientation in the case of R&D, but the interaction term is insignificant, indicating that religion is not influencing the effect of language. The coefficient of FTR is still negative and significant, with similar magnitude, suggesting that our previous results are not merely capturing a religion effect.

Effects of Cultures. To more thoroughly control for the effects of culture, we include the widely used Hofstede cultural variables (e.g., Hofstede 1980, 2001) in regressions, both individually (Models 1–6) and together (with all interaction terms, as in Model 7) in Online Appendix Table F.3. The Hofstede cultural dimensions rate each country along the dimensions of power distance, individualism (versus collectivism), uncertainty avoidance, masculinity (versus femininity), pragmatism, and indulgence (versus restraint)—detailed descriptions of the Hofstede cultural variables can be found in Online Appendix C. We find that some cultural variables are strongly correlated with CSR and R&D, potentially indicating that culture does play an important role in influencing a firm's future orientation. Nevertheless, FTR remains negatively and significantly correlated with CSR and R&D, and its economic magnitudes are comparable to the baseline effects shown in Table 2. In unreported tests, we obtain similar results when using the GLOBE cultural scores assembled by Chhokar et al. (2013). These results are consistent with our analyses that control for country fixed effects and within-country study, all of which already take this into account, as national cultures are largely time-invariant and homogenous within countries.

Furthermore, to account for the relatedness between different languages and between languages and cultures that can lead to spurious correlations, we follow the approach recommended by Roberts et al. (2015) and reestimate the FTR effects using mixed effects models (both with and without Hofstede cultural dimensions as controls) to control for cultural and language relatedness. These are essentially maximum-likelihood estimations with the fixed-effects estimation at the industry and year level, and the random-effects estimation at the firm level. As shown in Online Appendix Table F.2, our results are still upheld, reinforcing the argument that the language effect within organizations may be stronger than at the individual level because of the social nature of organizational future-time framing.

Finally, recent studies find that legal origin at the country level is an important predictor of firm-level CSR (Liang and Renneboog 2017). Our legal origin variable is the component orthogonal to our FTR variable, which captures the effect of laws in the countries that do not use English as their official language. The reason why we orthogonalize is to avoid multicollinearity between legal origins and FTR. We apply a two-stage approach by regressing *Legal Origin* (the English common law dummy) on FTR in the first stage, and put its residual (which is orthogonal to FTR) as an explanatory variable, together with other independent variables, in the second-stage regression.[5] Even after orthogonalization, the coefficient on "English common law (orthogonalized)" is statistically significant and indicates that legal origin and language FTR are different mechanisms that influence organizational behavior. In results presented in Online Appendix Table F.4, we also control for the unorthogonalized English common law origin dummy (panel A) and reversely orthogonalized English common law origin dummy (panel B), and our conclusions still hold (the coefficient on English common law origin is negative and highly significant, consistent with the findings of Liang and Renneboog). Even in subsamples of countries in which FTR and legal origins do not perfectly overlap (panel C), our FTR effect remains. All of these results suggest that the mechanism of language FTR on organizational behavior is conceptually different from that of legal origin, especially in the context of CSR for European languages (Liang and Renneboog 2017). The effect of language can vary within multilingual countries and be altered by exposure to multilingual environment, whereas the effect of legal origin is usually fixed at the country level and less malleable, which are also supported by our empirical results. In addition, the effects of Hofstede's culture variables such as *Long-Term Orientation/Pragmatism* in panel A of Online Appendix Table F.2 are mostly consistent with that in Liang and Renneboog (2017). It is worth pointing out that our "future-orientation" construct is at the organizational level and hence distinct from the country-level long-term orientation by Hofstede, which mostly captures whether a society has a more pragmatic or normative attitude toward societal changes.

Discussion and Conclusions

In this study, we connect two fundamental questions in the social sciences. First, the concept of the future is crucial in understanding the functioning and dynamics of capitalist economies (Beckert 2016) but is yet a

largely unexplored dimension of organizational behavior (Slawinski and Bansal 2012, 2015).

Second, the question as to whether language shapes the way people think goes back centuries; Charlemagne reportedly said that "to speak another language is to possess another soul." Linguists have long believed that people from culturally different backgrounds tend to order their worlds differently based on the language they use, such that some languages are hinged to categorical structures in which time is conceptualized in more abstract terms. In popular culture, these ideas have also begun to take hold. For example, in the 2016 movie *Arrival,* Dr. Louise Banks (played by Amy Adams), a linguist attempting to communicate with aliens, argues that "Language is the foundation of civilization. It is the glue that holds a people together" and, directly related to our thesis, that "if you . . . really learn it [the aliens' language], you begin to perceive time the way that they do. So you can see what's to come. But time, it isn't the same for them. It's nonlinear."

By developing a future-time framing perspective at the organizational level by emphasizing the social context of communications within organization, we link language use with organizational future orientation, which we argue may be an even stronger mechanism than the individual-level effects documented by Chen (2013). Although prior research has shown that a company's temporal choices and long-term orientation may affect its responsibility and sustainability (Bansal and DesJardine 2014; Slawinski and Bansal 2012, 2015), as well as uncertain investments, such as R&D (Chrisman and Patel 2012, McGrath 1997, Miller and Arikan 2004), they have not examined how organization-level cognition is related to the perception of time and how it is shaped by language structures. We theorize and test that when the categorical boundaries between the present and the future are sharper and more salient, the organization will be focused more on the present and less on the future. Our argument rests on the idea that because decision processes within organizations rely on discussion and negotiation—all of which significantly involve language use—organizational decision structures and processes would come to embody the future time cognitive tendency. Our three moderators on exposure to multilingual environments explore contingencies in which this future-time organizational tendency is reduced.

Our empirical results support our hypotheses: After including many controls and using fixed effects and subsample analyses, we find that language structures capturing a future orientation are robustly associated with decreased firm-level CSR and R&D expenditure across a large sample of global firms. Further supporting our theory is that the linguistic diversity and globalization of the country, and foreign institutional ownership of the firm—all of which can reduce the cognitive tendency against a future orientation that results from the use of a single language—are found to significantly attenuate the negative effects of language FTR. In unreported results, we find similar moderating effects of a firm's foreign sales and foreign assets, and its CEO's international experience (both work and education). Of course, given the cross-country nature of our empirical setting and controversies around Chen's original thesis, these results should be interpreted with caution. Nevertheless, based on various robustness tests, we think our empirical results suggest that future-time framing by language affects the extent to which organization-level future-oriented strategies are enacted. Our conceptualization and findings contribute to the literature on international organizational behavior and the roles of language in organizations.

Contributions to Research on International Organizational Behavior and Management Practice

In recent decades, researchers have begun to understand how various institutionally embedded organizational behaviors vary across countries, with most investigations focusing on the standard set of national business bundles that include cultural, political, legal, and economic systems (e.g., Aguilera et al. 2007, Guler et al. 2002, Matten and Moon 2008). Little is known, however, about how macro-level factors shape an important dimension of organizational cognition and practice—namely, how organizations consider time, or organizational future orientation, as well as its underlying cognitive mechanisms. By introducing the concept of future-time framing, we address this issue from the angle of how language as an important individual and societal construct can be extended to the organizational level to explain such cross-organization and cross-country differences in time perception. We also hypothesize that such language-induced cognitive categorization of time perception is malleable, and we identify several contextual factors related to an organization's exposure to multilingual environments that can reduce the effect of language on a company's future orientation. Our approach of focusing on within- and cross-country linguistic differences adds insight to the institutional perspective but also suggests that language-induced cognitive tendency is a different underlying mechanism from culture and legal origin. Moreover, although some organizational studies have investigated the link between organization long-term orientation and policies with regard to CSR (e.g., Flammer and Bansal 2017, Slawinski and Bansal 2012) and R&D (e.g., Azoulay et al. 2011, Lerner and Wulf 2007), to our knowledge, no other prior studies have provided a systematic investigation of a new concept (future-time

framing) that explains differences in future-oriented organizational behavior around the world.

Contributions to Research on the Cognitive Bases of Language in Organizations

Increasing attention is paid to how language affects organizational behavior in the organization and international business literature (see the review by Cooren et al. (2011) for organization studies and the review by Brannen et al. (2014) for international business). Studies in this field have mostly focused on two issues. One is the structure and dynamics of multinational or global teams, such as their trust formation (Tenzer et al. 2014), power struggles (Hinds et al. 2014), boundary spanning (Barner-Rasmussen et al. 2014), and employee motivation for enhancement (Bordia and Bordia 2014). The other stream focuses on the language effects on multinationals' activities, such as the relationship between headquarters and subsidiaries (Peltokorpi and Vaara 2012, Reiche et al. 2015), board communication (Piekkari et al. 2015), and the relationship between acquirers and targets in cross-border mergers and acquisitions (Cuypers et al. 2015). To date, however, there is a lack of research on how language can systematically shape organization-level future orientation, partially due to the fact that language is usually not conceived as a social practice that forms the cognitive base for organizational behavior, but rather as a discrete entity (Janssens and Steyaert 2014).

By identifying important structural differences across companies' working languages related to their future orientation and how such differences can be translated to organization-level cognition, we have introduced a new, important way of conceptualizing the effect of language on organizational behavior around the globe. We believe our study is a first step in identifying a novel yet highly important underlying factor that shapes cross-national organizational behavior. Furthermore, as we theorize, because language use within organizations directly affects communication processes and decision making, the effects may be even greater than for the individual-level behaviors shown by Chen (2013). That is, for the effect of future time framing to manifest in organizational behaviors, there need not be a cognitive change at the individual level, but the organization-level cognitive tendency is shaped by individuals using different language structures in daily discourse and discussion that then become part of established company policies and procedures. Our organization-level theorization of future-time framing may help us better understand country-level variations in social norms and policy making (e.g., Perez and Tavits 2017), as well as in how expectations may shape economic activities in capitalist societies (Beckert 2016). We think policymakers and corporate executives should consider such cognitive tendencies induced by language in their strategies and international expansion, and they can reduce such cognitive tendencies by exposing their companies to multilingual environments at different levels.

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Endnotes

[1] We acknowledge that in this paper, we mainly deal with time reference marked by verb tense. We are aware of the fact that the strict categorization is somewhat compromised in languages whose informal registers differ from the formal ones. For instance, in informal French and English, we often use the present progressive tense along with a lexical time indicator (e.g., "On va au parc demain" or "We are going to the park tomorrow"). Although it is equally grammatical to say "On ira au parc demain" and "We will go to the park tomorrow," the use of the formal future tense is somewhat stilted. We argue that the Verb Ratio and the Sentence Ratio, derived from the more standardized weather forecast, are better at capturing such "aspect" that goes beyond tense, and thus provide a nuanced measurement of language future-time reference.

[2] The official languages of most countries in our sample are unitary in FTR: either strong or weak. Note that this applies even to most countries that have multiple official languages. For example, in Spain, the official languages of Spanish and Catalan are both strong-FTR languages. A similar situation applies to Canada, where French and English are both strong-FTR languages (see Online Appendix A for more examples). Belgium and Switzerland are the only countries in our sample where both strong- and weak- FTR languages exist as official languages. We carefully classify firms based in Belgium and Switzerland according to the dominant language in the location of their headquarters.

[3] Following the accounting literature, especially studies by Koh and Reeb (2015) and Koh et al. (2017), we also address the issue of "missing R&D" (firms may strategically disclose their R&D activities,

or the company may fail to report its R&D spending due to other reasons) by (1) replacing missing R&D information with zero values, (2) including a blank "Missing" dummy, (3) replacing missing R&D information with the values of industry-average R&D, and cross-validating these results with the original results of treating missing R&D as missing. Our results are consistent across all of these tests.

[4] There are other countries with multiple languages as working languages in our sample, but their languages all belong to the same FTR category. For example, both English and French are spoken in Canada, and they are both strong-FTR languages.

[5] Besides the orthogonalizing approach, we have tried our best to further disentangle the effects of these two. Liang and Renneboog (2017) find that firms in civil law countries on average do more CSR than those in common law countries. But it is interesting to observe that many civil law countries are strong-FTR countries, and vice versa. There are quite a few examples of the distinction between legal origin and language FTR: Korea (German civil law and strong FTR), Spain (French civil law and strong FTR), Portugal (French civil law and strong FTR), Malaysia (common law and weak FTR), Hong Kong (common law and weak FTR), and Chile and most of former colonies of Spain, Portugal, and France (civil law and strong FTR). Thus, we can use these "anomalous" cases to provide further robustness checks. For example, even when we exclude these countries from our sample or test only on a subsample of these countries (e.g., we exclude countries with French civil law origin, or only include countries only with French civil law origin, or on a subsample of countries in which FTR and legal origins do not "overlap" (see panel B of Online Appendix Table F.4), we still find consistent results. This provides stronger evidence that our earlier results are not likely driven by legal origin and explained by the findings in Liang and Renneboog (2017), and others.

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