



The Role of Language in Knowledge Transfer to Geographically Dispersed Manufacturing Operations



Margaret Spring Schomaker^{a,*}, Srilata Zaheer^{b,1}

^a Université Laval, Faculté des sciences de l'administration, Pavillon Palasis-Prince, Local 1439, 2325 rue de la Terrasse, Québec (Québec) G1V 0A6, Canada

^b Elmer L. Andersen Chair in Global Corporate Social Responsibility, Dean, Carlson School of Management, University of Minnesota, 4-300G, 321 19th Avenue S, Minneapolis, MN 55455, United States

ARTICLE INFO

Article history:

Received 31 January 2012

Received in revised form 16 October 2013

Accepted 16 October 2013

Available online 5 November 2013

Keywords:

Knowledge transfer

Language

International operations

Distance

ABSTRACT

This study proposes a model of the effects of language on knowledge transfer to geographically dispersed operations. Rather than focusing on the distance between two language groups, we look at the commonalities between their languages, introducing the construct of *linguistic relatedness* as a way to measure the overlap in the structural features of the dominant languages at play between firms and their overseas manufacturing operations. We focus on the structural aspects of language (e.g., grammar, pronunciation, and word formation), rather than the functional aspects that deal with usage and interpretation. This allows us to separate the effects of language from those of culture and test whether linguistic distance may be more or at least differently relevant in communication-related tasks. We test our model of knowledge transfer and linguistic relatedness through a survey of international operations managers representing US-owned multinational enterprises with manufacturing plants in 22 countries. While linguistic relatedness shows the expected positive relationships with ease of knowledge communication and normative integration, it is negatively related to knowledge understanding – an echo of the psychic distance paradox and a reminder that distance can sometimes be beneficial, as it signals the need for attention to complex processes such as communication of knowledge.

© 2013 The Authors. Published by Elsevier Inc. Open access under [CC BY-NC-ND license](#).

1. Introduction

Firms with geographically dispersed operations face the fundamental challenge of dealing with myriad country differences, including regulations, cultures, and institutions. These differences raise the costs of doing business abroad (Hymer, 1976) and can represent disadvantage for multinational firms (Zaheer, 1995). Language is an especially apparent contextual difference. Misunderstandings and the extra communicative effort occasioned by one or both sides having to work in a non-native language can exacerbate already complex tasks. As we move toward greater global outsourcing of value adding-activities, the level of global communication rises commensurately, and language is likely to play an even bigger role in facilitating or hindering coordination among a firm's far-flung operations.

Knowledge transfer is one task that is of critical importance to the firm and, as such, has received a great deal of attention as a field of inquiry. Although research has considered the implications of asymmetries in the environments of the source and recipient knowledge transferring units, including both culture and institutions (e.g., Kostova, 1996; Naor et al., 2010; Szulanski, 1996), the language dimension has received less attention. Communication, however, does crop up often as a key aspect of knowledge transfer. For example, Nonaka and Takeuchi (1995) contrast organizational structures that foster uni-directional versus bi-directional communication in the creation and sharing of knowledge. Szulanski (1996) shows that, although motivation to transfer is important,

* Corresponding author. Tel.: +1 418 656 2131x7675; fax: +1 418 656 2624.

E-mail addresses: Margaret.Schomaker@mng.ulaval.ca (M.S. Schomaker), szaheer@umn.edu (S. Zaheer).

¹ Tel.: +1 612 624 7876; fax: +1 612 624 6374.

the relationship between parties and resulting ease of communication had an even stronger effect on knowledge transfer. Similarly, Ghoshal and Bartlett (1988) find that both inter- and intra-unit communication have a positive effect on the creation and diffusion of innovation within an MNE. Gupta and Govindarajan (2000) test a model of MNE knowledge flows based upon communication theory, looking at organizational and unit characteristics of sender, recipient, and transmission channel. Argote et al. (2003) take as a goal the reduction of communication costs as a means of enhancing transfer. Finally, Bresman et al. (1999) show that frequent communication is necessary for successful transfer of knowledge between headquarters and newly acquired foreign subsidiaries.

While recognizing communication's import for knowledge transfer, most studies operationalize communication in terms of frequency (e.g., Bresman et al., 1999; Ghoshal and Bartlett, 1988). These studies carry an implicit assumption that more is better. The findings of Bresman et al. (1999) notwithstanding, this is a theoretically unsubstantiated assumption. Intuitively we can see that when communication is difficult, unpleasant, confusing, or simply inaccurate, more is not necessarily better and can actually prove detrimental.

It is certainly true that communication is necessary for knowledge transfer. Without communication, knowledge cannot be transferred. It is the conduit of transfer. But problems can arise from a simplistic and idealized view communication: We believe that what we think, we say and that what we hear, we understand – that the knowledge gets from source to recipient in the exactly the state in which it left. Unfortunately, thoughts don't go directly from our mind to our tongues. Nor does the message necessarily arrive in our brains, intact. Communication is an elaborate process of product and reception, intention and inference (Armstrong and Kaplowitz, 2001; Sperber and Wilson, 1995). It is a process, moreover, that is critically dependent upon the linguistic resources available to the source and recipient. It is therefore imperative that studies of knowledge transfer take into account the role of language in determining the potential outcomes of communication.

Fortunately there has been a recent surge in work discussing the importance of cross-linguistic communication, including work linking language to communication. Barner-Rasmussen and Bjorkman (2005) show how fluency in the lingua franca can influence intensity of interunit communication. Brannen (2004) takes this new line of inquiry further by developing the concept of 'semantic fit,' predicated on the conceptualization of languages as systems of meaning that render an firm's products, practices and ideologies more or less appropriate for different international contexts. And one study does link language – and more particularly, linguistic distance – to knowledge transfer. Ambos and Ambos (2009) find that linguistic distance moderates the relationship between knowledge coordination mechanisms and knowledge transfer effectiveness *above and beyond the moderating effects of cultural and geographic distance*, suggesting that language represents a form of distance that may operate in different ways than cultural distance.

One plausible reason that this last point has been often overlooked lies in the demonstrated relationship between language and culture (e.g., Hofstede, 1980; Ronen and Shenkar, 1985), suggesting that the effects of language may be captured in measures of culture. Much of the research on language in international business either treats language as a single discrete construct or focuses specifically on the culturally-bound aspects of language, such as semantics and pragmatics (the creation of static and dynamic meaning, respectively). This creates a problem for measuring the effects of language, as culturally driven aspects of language may be captured by measures of culture – but the entirety of language issues is not identified, nor are the effects of language isolated. As pointed out in Welch and Welch (2008), although language and culture are undeniably related, their respective influences on communication patterns are likely to be distinct. Understanding these distinctions will provide some guidance for organizations as to whether and when to rely on people with international versus linguistic expertise, as fluency in a language does not automatically convey cultural fluency, nor vice versa. We offer a way to create some separation between the effects of language and culture and move this line of research forward by focusing instead on the structural foundations of language rather than on its culturally-bound aspects.

Linguistic theory makes a distinction between the *functional* and *structural* aspects of language. The former, which focuses on language usage, is unquestionably tied to culture. Societies that share a language (e.g., France and Canada) differ in culturally bound functional aspects such as semantics and pragmatics; the structural elements of the language, though, (such as grammar) are relatively invariant across cultures. Structural analyses of language focus on the fundamental characteristics of languages that influence their acquisition and use (Chomsky, 1980), rather than on their usage per se (Van Valin, 2003). Using this structural approach, we introduce the concept of linguistic relatedness of languages across subunits and compare its effects with those of various measures of cultural relatedness, demonstrating their respective influences and distinctiveness.

We argue that this structural approach is particularly useful not just because it differentiates language from culture, but because it has been shown that the extent of linguistic relatedness affects the ability of individuals to learn and use the foreign language. We know foreign language competence of source and recipient to be a factor in the transfer of knowledge within the firm (Björkman and Piekkari, 2009; Sunaoshi et al., 2005). Linguistic relatedness provides a construct at the language level, rather than the individual level. Language and communication are often studied at the level of the individual source and recipient. However, for knowledge transfer to foreign operations, dissemination of knowledge typically occurs among groups from one unit to another and often the outcomes cannot be disaggregated to the between-individual communication events.

Our focus is on such unit-level transfer between headquarters and manufacturing plants located in countries with a single dominant language. By 'dominant', we mean a single language with country-wide use. Many countries have indigenous languages or large groups of immigrant populations from countries with other languages. The dominant language, however, is the one most everyone is educated in and is used as the language of institutions and of commerce and thus the dominant language is likely to be the modal language of the unit.

We suggest that when the *unit languages* of headquarters and manufacturing plant differ because the units are located in countries whose dominant languages differ, the extent of linguistic relatedness – and thus, structural overlap – between the unit languages will influence both the ease with which knowledge is transferred, as well as the level of comprehension of the knowledge at the destination unit. In addition, we look at the mediating role of the subunit's normative integration with headquarters (Ghoshal and

Bartlett, 1988). While this type of integration – of people and identity – is expected to alleviate the information processing burdens of cross-linguistic knowledge transfer (Egelhoff, 1982; Galbraith, 1977) and improve knowledge transfer outcomes, we argue that it will be less likely when linguistic relatedness is low. The commonalities or differences arising from relatedness and non-relatedness are salient to each of the groups and can evoke a response – conscious or not. Speakers of Spanish preparing for a meeting with their counterparts in China are likely to have very different expectations with respect to communication than they would for a meeting with their counterparts in Portugal, simply by virtue of their perceptions of how different the languages are.

We view the main contribution of this paper as theoretical, bringing forward the concept of linguistic relatedness as an alternative to distance. Where distance focuses on the negative consequences of differences between societies (Shenkar, 2001), linguistic relatedness gets at one aspect of commonality between societies, but in a more nuanced way than a simple same-language/different-language dichotomy. Beyond the theory, however, we do test our model with a survey of U.S.-based firms with international operations, asking about knowledge transfer efforts from headquarters to manufacturing plants located in countries with a single dominant language. We find that lower linguistic relatedness between the home and host languages in practice makes knowledge transfer more effortful, but unexpectedly leads to greater ultimate comprehension of the knowledge by the destination unit. We argue that when home and host units have significantly different languages, the units anticipate knowledge transfer problems. These expectations trigger added vigilance for misunderstanding and may even prompt preemptive action, ultimately helping rather than hurting knowledge understanding.

2. Literature review

Despite assertions that a critical advantage of firms is their ability to transfer knowledge internally, investigations into the process of knowledge transfer have made it abundantly clear that, even with this advantage, transferring knowledge is still a challenge. Szulanski (1996) details myriad sources of the difficulties in transferring knowledge, compartmentalizing them into the following broad rubrics: characteristics of the knowledge transferred, characteristics of the source of knowledge, characteristics of the recipient of knowledge, and characteristics of the context. 'Distance' research can be said to overlap the concerns of the latter three of these – source, recipient, and context.

The term 'distance' may have arisen primarily as a metaphor (Shenkar et al., 2008), but it has attained a status of concreteness. The knowledge transfer literature has numerous examples of the effects of multiple forms of distance. Little attention, however, has been paid to the idea of language and linguistic distance between knowledge source and recipient units. The connection between language and knowledge transfer is, in fact, a fundamental pillar of the knowledge-based view of the firm, which states that an advantage of organizing as a firm is that knowledge is more easily transferred from one part to another specifically because of properties inherent to firms – one of which is a common language (Arrow, 1974; Kogut and Zander, 1992). Several researchers have shown that knowledge transfer is clearly dependent upon communication (e.g., Bresman et al., 1999; Chini, 2004; Szulanski, 1996). The extension of this relationship to language is easily intuited. Nonetheless, communication persists by and large as a language-independent construct, conceptualized without respect to which and how many languages are contributing to the communication process. The link between language and communication is often forgotten or glossed over.

A couple of notable works have directly addressed this glaring gap. The first is Gupta and Govindarajan's (2000) explication of knowledge flows within multinationals, which includes a same-language-different-language variable as a proxy for absorptive capacity. Even more on point is Ambos and Ambos (2009), which proposes and tests a model of knowledge transfer effectiveness that includes not just linguistic distance, but cultural and geographic distance as well. Results from this study clearly indicate the salience of linguistic distance to the knowledge transfer process, showing it to moderate the personal coordination mechanisms that facilitate knowledge transfer effectiveness.

It is to this work that we aim to contribute. In the following sections we will review how knowledge transfer between units located in countries whose dominant languages differ requires working in a lingua franca. We then propose a variant of linguistic distance – linguistic relatedness – and explain how the relatedness of any pair of languages leads to structural commonalities between them. We then argue that those commonalities will affect communication in a lingua franca and, ultimately, two of the knowledge transfer outcomes: knowledge understanding and ease of knowledge communication.

2.1. The roles of unit languages and lingua franca

A firm's plants may be located in countries whose dominant languages differ from that of the headquarters. In such cases, the language used between headquarters and subunit may actually differ from the language that dominates the everyday conversation within the subunit (Luo and Shenkar, 2006). While there may be a *lingua franca* designated by headquarters for interunit communication and used for official documents and events, the principal language used by the subunit's members to communicate among themselves in their daily work life – i.e., the *unit language* is likely to be the dominant language of that country. In multilingual countries, such as India, the unit language may be either a regional language or a national language such as Indian English. Fredriksson et al. (2006) find that even when a lingua franca is formally declared, subunits continue to operate in both languages.

This kind of concurrent use of both lingua franca and unit languages almost certainly happens in the process of interunit knowledge transfer. This is in part due to the fact that knowledge transfer is seldom a one-to-one communicative process, as organizational knowledge and best practices reside across members and must be disseminated to multiple members in the

recipient unit. So even in the case where the headquarters posts a home-country national in the foreign plant, the dispersion of the knowledge must still occur across the rest of the plant employees.

2.2. Linguistics-based theories of communication

The information theory of communication – informally known as ‘code theory’ – is a dominant paradigm of the communication process, perhaps because of its intuitive appeal. Code theory treats communication as a purposive event involving encoding and decoding of a message between a source and recipient (Samovar et al., 1981; Shannon and Weaver, 1949). In the case of interunit knowledge transfer, the primary goal of the communication is a sufficiently close reproduction of headquarters knowledge at the recipient subunit. This description fits nicely with the articulation of relevance theory, whose authors – Sperber and Wilson (1995) – proposed it as a humanizing enhancement of the more mechanically-leaning code theory. Relevance theory sees communication success as the construction of same or sufficiently similar representations of the message in both source and recipient(s) – the source’s with respect to the intended meaning, and the recipient’s with respect to the inference as to the source’s intent.

One central tenet of relevance theory is that the construction of the representations is a function of each side’s language. A language consists of a set of *linguistic resources* used for communication (Crystal, 1997). At the most basic level, these resources include: a system of sounds and the rules for combining them; a lexicon of words and word parts, and the syntactic rules for creating grammatical phrases; and systems of meaning, both semantic – embedded in the relationships between words and the concepts to which they refer – and pragmatic – embodied in socioculturally determined norms of language usage (Armstrong and Kaplowitz, 2001). To successfully communicate entails both source and recipient(s) having recourse to enough of the same linguistic resources to be able to encode and decode the message so that source and recipient construct same or similar representations of the message (Sperber and Wilson, 1995). Lack of congruence between the linguistic resources of any two languages raises the likelihood that source and recipient do not have the same sets of linguistic resources from which to construct such representations (Ronen, 1986).

2.3. Linguistic relatedness

One factor affecting whether source and recipient share sufficient overlapping linguistic resources to communicate effectively is the degree of linguistic relatedness between two languages in terms of their historical descent from a common linguistic ancestor (Comrie, 1989). Linguistic relatedness captures the structural overlap between two languages in terms of their syntactics, and is known to enhance second language performance and acquisition of second language word meaning as well (Kaushanskaya, 2007). Research conducted by the U.S. Foreign Service Institute shows that speakers of American English more easily learn languages that are more closely related to English and will achieve a higher level of proficiency in those languages (Foreign Service Institute, 2004; Hart-Gonzales and Lindemann, 1993). Furthermore, despite achieving a level of proficiency, people communicating in a non-native language are still almost always using a system of resources that is less complete than that of their native language (Ellis, 1994; Ronen, 1986).

Work in semiotics (the field of linguistics devoted to the construction of meaning) breaks language into three branches: pragmatics, semantics, and syntactics (Morris, 1946). Recent work in international management has explored the effects of non-congruence between languages with respect to the first two of these branches. Brannen (2004), for instance, exposes the potential for a lack of ‘semantic fit’ when a company’s products and practices are interpreted with respect to the meaning created by a lingua franca that differs from that of the language in which the products and practices were conceived. Renzl (2007) builds on this idea by modeling the linguistic contextualization of knowledge. Pragmatics and semantics, however, are both influenced significantly by culture.

Our approach to the effects of linguistic relatedness rests on the third branch – syntactics – which deals with the structural elements of language and is less dependent on cultural aspects. We conceptualize linguistic relatedness as the distance on and between language family trees (Grimes, 1992; Voegelin and Voegelin, 1977), which primarily captures overlap in the syntactics of languages, rather than functional differences in usage. This is because it is generally the structural elements such as sound and writing systems and grammatical rules that show inheritance from common language parents (Crystal, 1997).

Fig. 1 offers a modified version of Shannon and Weaver’s (1949) code theory the communication process, showing the basic elements: information source, channel, and destination, as well as the processes of message encoding and decoding and feedback. Feedback here refers to the “information available to a source that allows the source to make qualitative judgments about the effectiveness of the communication situation in order to adjust and adapt to the on-going situation” (Samovar et al., 1981, p. 15). While feedback may be linguistic – in which case the feedback can be treated essentially as a new communication where the destinator becomes the source – it can also consist of other things such as facial expressions, eye contact, or body language. In these cases, feedback can occur in real time, affecting the encoding or even the message itself while the source is still encoding. Because the original model was intended for engineering purposes, the encoding and decoding processes were left unspecified. The modified version shown in Fig. 1 makes the process specific to human communication and shows where the interlocutors’ linguistic resources come into play.

Finally, it is important to note that linguistic relatedness operates at a level broader than the individual. As explained earlier, linguistic relatedness implies a degree of commonality between structural linguistic features of two languages that is commensurate with their degree of relatedness. This makes the linguistic relatedness measure a useful tool in the absence of individual-level data. In the following sections, we propose and test a model of knowledge transfer which incorporates the effects

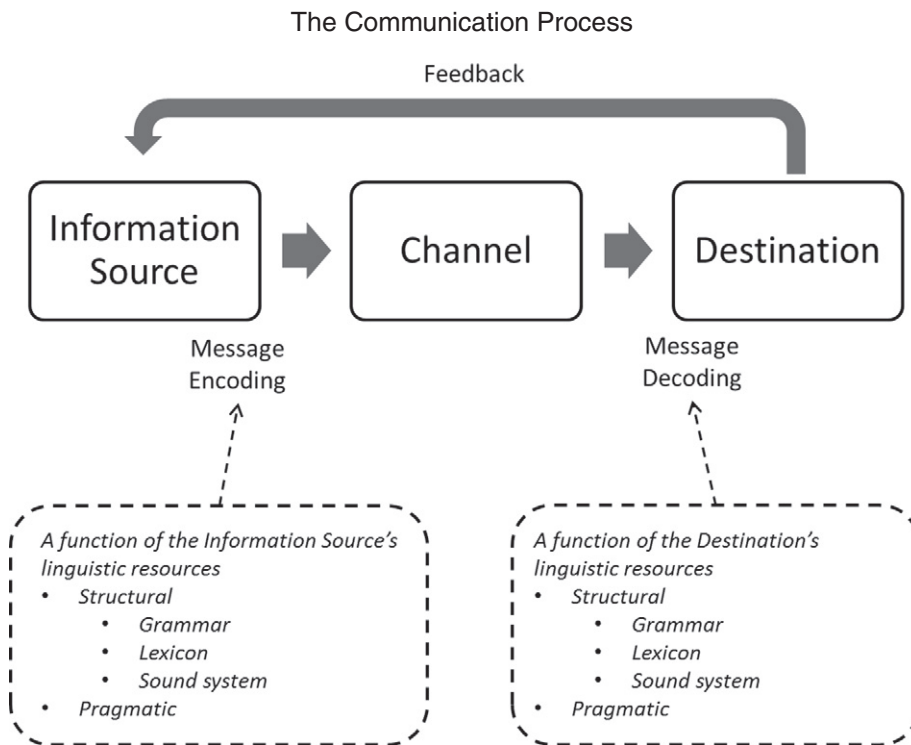


Fig. 1. The communication process.

of linguistic relatedness between the languages of the information source unit and the destination unit. We argue that the structural commonalities arising from linguistic relatedness can influence knowledge transfer at a number of points in the process.

3. Model and hypotheses

Our model of knowledge transfer to international operations looks at the impact of linguistic relatedness on communication-dependent knowledge transfer outcomes, as well as at the mediating role played by normative integration of the foreign operations (see Fig. 2). We focus on the knowledge transfer outcomes of *knowledge understanding*, which captures

A Model of Cross-Linguistic Knowledge Transfer to Foreign Operations

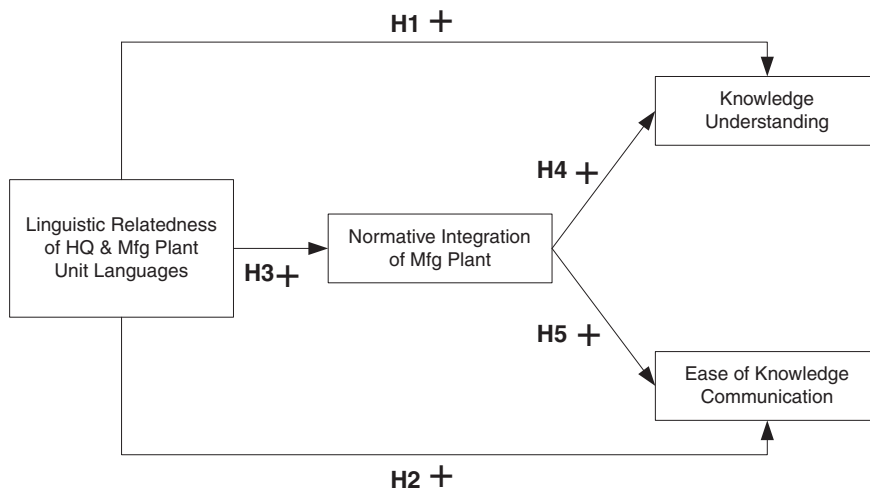


Fig. 2. A model of cross-linguistic knowledge transfer to foreign operations.

simple comprehension of the knowledge being communicated, and *ease of knowledge communication*, which focuses explicitly on how effortful the communication of the knowledge was, as we believe these aspects of knowledge transfer are particularly dependent upon communication and, thus, upon language.

3.1. The direct effects of linguistic relatedness

We argue that the consequences of linguistic relatedness arise from the fact that, because the lingua franca will be non-native to either or both headquarters and plant, members of one or both units, each with its own unit language, will be operating with a reduced set of structural linguistic resources, affecting such things as grammar, pronunciation and word formation.

Lack of structural linguistic resource overlap between lingua franca and the unit language may affect the encoding and decoding of the message, resulting in differing representations of the knowledge being transferred from source to recipient. Both the encoding and decoding processes are affected by the *degree* of overlap of the lingua franca and unit languages – i.e., the linguistic relatedness. Greater overlap raises the likelihood of both source and recipient having recourse to the same resources, reducing the likelihood of selecting an unfamiliar word or grammatical construction in either the encoding or decoding process. This leads to better understanding of the knowledge being transferred.

When linguistic relatedness is low, source and recipient units might resort to various 'compensatory strategies' to work around the gaps in their linguistic resources (Carroll, 1990; Ellis, 1994; Odlin, 1989); strategies include avoiding what cannot be articulated, switching to the unit language, or making 'educated guesses' based on the unit language (Bialystok, 1990). Such strategies not only increase the likelihood of misunderstanding, but also raise the effort needed to communicate across units, with this kind of laborious communication reducing the success of knowledge exchanges (Arrow, 1974; Szulanski, 1996). Greater linguistic relatedness, in turn, cuts down on errors, disfluencies, and the need to use compensatory strategies; knowledge understanding and ease of communication are both enhanced, as the process is smoother and less effortful, and likely more accurate as well.

In addition, linguistic relatedness and the degree of overlap in the source and recipient units' languages will have an effect on the feedback process when the feedback is in a linguistic form (i.e., verbal or written). In these cases, feedback is subject to similar encoding and decoding difficulties and use of compensatory strategies when linguistic relatedness is low. As a result, the feedback and adaptation process is also not likely to function well, and thus may lead to misunderstanding or lack of understanding and diminished ease of knowledge communication.

Finally, linguistic relatedness is also likely to prove of benefit in terms of the ease and comfort of communication. In explicating the role of psychological safety on knowledge sharing, Siemsen et al. (2009) refer to the need to be able to "speak without fear of humiliation or uncertain reception" (p. 433). We suggest that, just as confidence in the one's own knowledge affects willingness to share information, so too might confidence in one's ability to articulate that knowledge. In situations where the language on the floor of the plant is significantly different from the lingua franca, employees might withhold feedback, questions, and information out of fear of embarrassment, thus rendering the transfer of knowledge significantly more difficult. We propose, therefore,

Hypothesis 1. The greater the linguistic relatedness between the lingua franca and unit language of the manufacturing plant, the greater the plant's level of knowledge understanding.

Hypothesis 2. The greater the linguistic relatedness between the lingua franca and the unit language of the manufacturing plant, the greater the ease of knowledge communication between headquarters and plant.

3.2. The mediating role of normative integration

In manufacturing subsidiaries the transfer of proven successful practices from headquarters to subsidiaries is one way to achieve efficiency and, ultimately, low cost (Ahmad and Schroeder, 2002). One factor that may affect the ability to transfer such practices is the development and use of informal relationships, the promotion of which is referred to as 'normative integration' (Ghoshal and Bartlett, 1988).

Language appears to have an effect on certain types of integration of foreign subsidiaries. Björkman and Piekkari (2009) find that companies exert greater control via formalization and centralization of decision-making over subsidiaries with low competence in the lingua franca, though no link between low linguistic competence and the more informal, socialization-focused aspects of normative integration. We suggest that when linguistic relatedness is low, the ensuing difficulties may ultimately discourage or hinder more socially-bound integration efforts, as the need for constant negotiation of meaning or having to compensate for the other's lack of comprehension will quickly deplete the units' store of good will toward each other. Managerial attitudes have been posited to differ across language clusters (de la Torre and Toyne, 1978) and language can therefore polarize units, insofar as such differences emphasize identification with the respective countries, rather than with the firm as a whole (Milton and Westphal, 2005). This in turn can cause the multinational to neglect the promotion of informal relations. Welch and Welch (2008) suggest a number of mechanisms through which language operates, including teamwork, networks, and trust – all of which are key in normative integration.

Fluency issues, too, complicate matters. Barner-Rasmussen and Bjorkman (2007) found that language proficiency leads to being perceived as trustworthy and having a shared vision. Björkman and Piekkari (2009) determined that, although low language competence in a subsidiary leads firms to use centralization and formalization as a means of exerting control over the subsidiaries, low language competence appeared to have no significant effect on the use of socialization mechanisms. We would

argue that linguistic relatedness is at the language level, rather than the individual level, and therefore promotes generalizations – warranted or not – about all speakers of a particular language. These generalizations are likely to be positive in the case of close linguistic relatedness. Makela et al. (2007), for example, observed that a common language was a powerful source of homophily, which strengthened interpersonal attraction and the formation of informal connections.

Finally, research on the degree of diversity in teams indicates that significant and observable group-level differences can polarize the units and foster a sense of us-versus-them (Earley and Mosakowski, 2000). Different primary national languages at headquarters and foreign plants would be one such salient difference. Not only is language a differentiating characteristic, language is one of strongest sources of ethnic group identity (Fiol, 2002; Moingeon and Soenen, 2002). Adler (2002) suggests that this kind of negative diversity in group interaction can lead to avoidance of further interaction. When linguistic relatedness is lower, the potential for polarization is greater and may discourage interaction between the units. Taken together, this suggests that normative integration is less likely when linguistic differences are obvious and, conversely, more likely when relatedness is high. Therefore,

Hypothesis 3. The greater the linguistic relatedness between the lingua franca and the unit language of the manufacturing plant, the greater the plant's normative integration with the headquarters.

In their study on knowledge transfer in China, Buckley et al., 2005 reveal that success rests not just on having a common language, but also on having the shared social experience that helps interpret others' behavior and the context in which the knowledge itself was created (Nonaka, 1994). Moreover, interpersonal ties between employees of foreign operations and those based in the headquarters facilitate the development of trust, leading in turn to greater information integration (Cai et al., 2010). Close association between headquarters and plant may help lay a sound infrastructure for the conduit of knowledge (e.g., Bresman et al., 1999; Gupta and Govindarajan, 2000; Szulanski, 1996). In investigating the international diffusion of innovations within firms, Ghoshal and Bartlett (1988) found normative integration to be a great facilitator of the movement of such knowledge. Even more directly, socialization has been found to enhance communication performance along the supply chain (Cousins and Menguc, 2006). This may be due to both the fostering of trust, as well as the fact that normative integration fosters a common corporate culture, which in turn may increase both units' linguistic resources in terms of both the national and organizational languages. The latter, also known as company 'speak', comprises organization-specific acronyms, terms, and process terminology (Welch et al., 2005) – a fairly delimited set of linguistic resources that are likely to be easily acquired, yet immensely useful. The acquisition of linguistic resources through mutual increased exposure would reduce the effects of structural non-overlap due to low linguistic relatedness, and thus make it more likely that source and recipient reference the same resources in forming their representations of the information being transferred, leading to greater understanding.

In addition, the sense of belonging and identification with the firm as a whole that is engendered by normative integration can provide social support and scaffolding to facilitate communication, and raise willingness to cooperate despite communicative difficulties (Milton and Westphal, 2005). If a sense of trust and cooperation positively affects the firm's ability to exchange and combine knowledge (Collins and Smith, 2006), the informal relationships developed through normative integration are likely to ease knowledge communication and improve understanding. These effects, in turn, are expected to decrease perceptions of difficulty and eventfulness in knowledge communication. Therefore,

Hypothesis 4. The greater the level of the plant's normative integration, the greater the plant's level of understanding of the knowledge being transferred.

Hypothesis 5. The greater the level of the plant's normative integration, the greater the ease of the knowledge communication between headquarters and plant.

4. Methods and context

This research into the effects of language differences on knowledge transfer across national borders began with a qualitative investigation, using semi-structured interviews with four executives whose experiences included oversight of foreign operations. Informants were quizzed, among other things, about relevant terminology, so as to determine which terms and phrases would strike the same chord with targeted managers. When questioned as to which managers would most often be required to effect knowledge transfers from headquarters to international subunits, the absolute consensus was those managers concerned with manufacturing operations, as knowledge transfer between headquarters and plants in foreign countries is a frequent and critical process. This, therefore, became the chosen empirical context in which to test our model of cross-linguistic knowledge transfer.

In interunit knowledge transfer there is of course potential for variation in the linguistic resources of individual members in linguistically heterogeneous subunits. In countries with a single dominant language, however, that language is likely to exert the greatest influence on the language repertoires of individuals in the unit and dominate as the unit language – especially for interunit communication. Consequently, our level of analysis is the unit and linguistic relatedness is conceptualized as between the lingua franca and the unit language of the recipient unit.

Linguistic relatedness, our key independent variable, is drawn from public sources of language categorization, while our normative integration and knowledge transfer are measured via a survey of U.S.-based multinationals with foreign manufacturing plants. The survey was directed to top-level headquarters-based managers who oversaw relations with foreign manufacturing

plants. They were asked to choose a manufacturing plant to which headquarters provided a very specific type of operations knowledge (regarding delivery, innovation, flexibility, cost, and quality – all of which were defined for the respondents) and report on that knowledge transfer.

We wished to avoid manufacturing plants in countries whose subregions have different primary languages since, as Hofstede (1980) reports, this type of linguistic plurality can lead to discrete cultures within a single country and we wanted to test whether any effects we found accrued to linguistic distance or cultural distance. Consequently, we provided a list of 33 countries so as to steer the respondents toward countries that, while possibly having indigenous languages or large immigrant populations, had one dominant language with full-county spread. We received responses corresponding to 20 of the 33 countries, as well as write-ins for manufacturing plants in the United States and China. Although these latter two were not among the countries listed on the survey, we decided to include the responses, given that each of these countries has a single set of Hofstede and Globe Study cultural scores (the cultural variables we tested). We nonetheless took the precaution of running our analysis both with and without these unsolicited countries, obtaining the same results.

Although the primary independent and dependent variables come from completely unrelated sources, the inclusion of a mediator drawn from the survey means that we cannot entirely eliminate the potential for common method bias and so we test for its presence.

The survey instrument comprises mostly multiple-item ordinal scales aimed at capturing perceptions of knowledge transfer success and tailored to the operations-specific context chosen for this study. Most scales were based on related studies, but semi-structured interviews with both business executives and academics were also used to inform the model and the development of the instrument. Pre-testing for validity included review by both industry and academic experts, as well as think-aloud tests (a method of cognitive interviewing in which respondents are asked to articulate their thought processes as they read and respond to the survey (Willis, 2005)). This latter development technique was particularly useful for refining the vocabulary used in the study, as for example when it became obvious that people had widely varying ideas as to the meaning of such words as 'efficiency' and 'performance'. Pilot testing of the instrument for both reliability and validity was carried out using international managers enrolled in a highly ranked university's MBA and Executive MBA programs, thus providing a close approximation of the desired final sample.

4.1. Variables

4.1.1. Knowledge transfer

Patent citations are often used to measure knowledge transfer (e.g., Almeida and Phene, 2004; Appleyard, 1996). However, Bresman et al. point out that "patents represent a relatively articulated form of knowledge, and they are unlikely to require the same level of personal interaction between individuals to be effectively transferred" (1996, p. 450). Thus, to maximize meaningful variance for our constructs of interest, and because the recipient units of this study are all manufacturing plants, we chose to focus on the operations-specific knowledge as a form of knowledge likely to entail greater interunit communication. Although transfer of other types of knowledge undoubtedly occurs, there is a greater imperative when the knowledge is relevant to the fundamental mission of the unit. Ahmad and Schroeder (2002) provide an in-depth look at measures of competitive priorities for operations. These competitive priorities are an attempt to specify firms' goals for their plants in terms of achieving competitive advantage (Ahmad and Schroeder, 2002). From the possible measures available in the literature the authors find and validate four dominant factors: delivery, innovation, efficiency, and quality. These factors reflect operations-level competitive priorities. They further note that business unit level strategies, such as achieving low unit cost can contribute to the competitive priorities of the plant. They also indicate the strong appeal of the construct of 'flexibility' (in terms of volume and product mix), but note that it was subsumed within the factors of innovation and efficiency. Pre-test interviews with managers found a strong preference for the idea of 'flexibility', as they found 'efficiency' a more amorphous construct.

This study consequently focuses on five areas of knowledge that correspond to the competitive priorities of delivery, innovation, flexibility, cost, and quality. All survey items pertaining to knowledge are framed within these terms. Items for knowledge understanding include: (1) In your opinion, to what extent has this plant fully understood any knowledge provided by corporate headquarters with respect to: delivery, innovation, flexibility, cost, quality [anchors: 'not at all', 'to a great extent']; (2) To what extent do you feel this plant implemented any knowledge provided by corporate headquarters with respect to: delivery, innovation, flexibility, cost, quality [anchors: 'not at all', 'to a great extent']. Ease of knowledge communication was measured with the following: How demanding or easy has it been to communicate knowledge from corporate headquarters to this plant with respect to: delivery, innovation, flexibility, cost, quality [anchors: 'very demanding', 'very easy']. The following elaborative statement was used both to focus respondents' attention on these particular areas of knowledge and to provide a working definition of each to which they could refer:

"The following questions refer to 5 of the primary goals of operations: delivery, innovation, flexibility, cost, and quality. Delivery is concerned with production speed and dependability. Innovation refers to the plant's ability to introduce or revise products. Flexibility refers to product mix and scheduling. Cost involves the ability to achieve low unit cost and low inventory. Quality refers to the ability to turn out products conforming to design or specifications. Please answer the following questions with respect to these five broad categories."

Pilot test respondents and pre-test interviewees gave strong support for the use of this statement, indicating that it was helpful to them for both the above reasons. Using this focusing statement, respondents are asked for their perceptions of the subunit's knowledge understanding in terms of simple comprehension (a direct measure) and the success of implementation (an indirect measure), as well as the ease with which the knowledge was communicated. Principal component analysis on these

measures revealed that the items pertaining to innovation loaded on a factor separate from the other four types of operations knowledge. Because of the wide range of industries represented, it appeared that innovation would mean very different things across the sample. It was therefore decided to remove the two items related to innovation, after which the rotated solution produced a single factor for knowledge understanding.

4.1.2. Normative integration

Normative integration refers to the efforts to promote informal relations that cut across the firm hierarchy and that relieve information processing burdens on the upper management echelons by creating access to more information through mid- and lower-management levels (Galbraith, 1977). Galbraith emphasizes that, while these are informal ties, the firm can try to facilitate them. Promotion of the firm's values, goals, and identity via corporate culture, dense informal interactions, and participation in cross-border activities will help establish strong social ties between units (Ghoshal and Bartlett, 1988). Items based on scales developed by Ghoshal (1986) and Harzing (2002) were used to create the normative integration scale used here: (1) To what extent does corporate headquarters promote the following in this plant: having a 'corporate culture' similar to that of headquarters, communicating informally (i.e., unscheduled and unofficial communication) with people at headquarters [anchors: 'to a very low extent', 'to a very great extent']; (2) To what extent does this plant: have a 'corporate culture' similar to that of headquarters, communicate informally (i.e., unscheduled and unofficial communication) with people at headquarters [anchors: 'to a very low extent', 'to a very great extent'].

4.1.3. Linguistic relatedness

Linguistic relatedness is concerned with the degree of commonality of linguistic resources between two languages. Because the array of linguistic resources is so vast, attempts to compare languages are somewhat limited and no direct exhaustive measure of overlap exists. As discussed earlier, languages differ systematically, exhibiting linguistic universals (such as having a subject and verb) and variation (such as the order of subject and verb) (Chomsky, 1965; Comrie, 1989). Typology is a branch of linguistics that develops and refines classification systems by which to compare the world's languages in terms of similarities and differences in their features. These classifications are mostly limited to structural principles, focusing especially on sound systems, syntax, and vocabularies (Comrie, 1989; Croft, 2003).

A number of researchers have suggested that distance within and between linguistic family trees, provides a reasonable measure of linguistic relatedness (Ambos and Ambos, 2009; West and Graham, 2004). Moreover, this measure captures mostly structural linguistic overlap, rather than overlap in culturally-bound functional or pragmatic features, as it is generally the elements of sound and writing systems, grammatical rules and vocabulary that develop over time and show inheritance from common language roots (Crystal, 1997). For example, where German has a nodal distance from English of only one, French would have a distance of three. Spanish and Italian, as sister language of French, would also have a nodal distance of three (with a nodal distance of one between each of the sisters). In our study, we therefore measure linguistic relatedness by calculating the distance on and between language family trees (using Grimes, 1992; Voegelin and Voegelin, 1977), yielding a continuous variable measure of the relatedness between languages. Because this study fixes the source unit in the U.S., the relatedness of the plant's unit language is always measured with respect to American English as the lingua franca. It should be noted that while some typologists take issue with classifications claiming the relatedness of nearly all languages (see Comrie, 2003; Ruhlen, 1994), we do not see this as an issue in our study as even the most conservative classification systems show relations between the primary languages of the countries in which international business is conducted.

4.1.4. Control variables and instrumental variables

In order to negate the effects of including endogenous dependent variables (i.e., mediating variables) in the model, it is necessary to include instrumental variable for each of the equations (Shaver, 2005). In such a case when the independent variable is likely to be correlated with the error terms of the equation, including instrumental variables – i.e., a variable that is correlated with the endogenous independent variable, but not with the error term of the equation – results in a more consistent estimation. Thus the primary purpose of these instrumental variables is not to add to the story, but to the statistical integrity of the model analysis. (Although in the case of cultural distance, the variables serve both purposes.) Instruments for the first equation (the relationship between linguistic relatedness and normative integration) are: firm size, plant size, entry by M&A, years with a presence in that country, pressures for local responsiveness, and plant performance. Equations two and three (the relationships of normative integration to knowledge understanding and ease of knowledge communication) include cultural distance, years of international experience, and HQ's motivation to transfer knowledge. All instrumental variables were verified via simple linear regression to be certain they exhibited the proper relations (i.e., predictors for the mediating variable, but not for the dependent variable in each equation).

In addition to cultural distance (with a range of measures), we control for a number of other variables that have been shown to be pertinent to the knowledge transfer process, including plant autonomy, firm experience, industry effects such as pressures for local responsiveness.

The likelihood that aspects of culture apart from language will affect the dissemination of operations practices is high given similar relationships documented within the operations literature. For instance, Zu et al. (2010) show that culture influences the implementation of individual aspects of TQM/Six Sigma practices; while focused on organizational culture, this study has logical extensions to national culture, given research on the strong connection between the two levels of culture (e.g., Hofstede, 1980; House et al., 2004). A further example is provided by Flynn and Saladin (2006), who find that national culture influences the effectiveness of the Baldrige constructs, one of whose aims is to provide direction for firms in the communication of best practice

information. Finally, Naor et al. (2010) offer evidence of national culture's effects on manufacturing performance, both in terms of individual aspects of the host culture and the fit between the organizational and host country's culture.

It is the notion of fit that we focus on here, considering the cultural distance between the home and host countries. *Cultural Distance* between headquarters and manufacturing plant is captured in our study primarily with Hofstede's (1980) indices of culture, although in a series of robustness checks, we use a range of other measures of culture including House et al.'s (2004) GLOBE measures, the Kogut and Singh (1988) composite measure of cultural distance, and Hall's (1981) descriptor of high and low-context cultures. We calculate distances between scores for source and recipient unit locations along each of the following four Hofstede dimensions: power distance, uncertainty avoidance, masculinity/femininity, and individualism/collectivism. Because the source unit location is fixed (focal knowledge transfer is from American headquarters to plant), the cultural distance measures here are all with respect to the United States. Hence, the general formula for cultural distance along each measure is: $D_i = I_{iu} - I_{is}$ where the distance between the source and recipient units is the difference between the index score for the source unit u (for the United States) and the recipient unit s (for the plant), and is calculated separately for each cultural index i . Hofstede later added a fifth dimension, long term orientation, but provided scores for only some of the relevant countries. Because a substantial number of the scores were unavailable (Hofstede or otherwise), this dimension was not included. We prefer to introduce Hofstede's dimensions separately, as suggested by Shenkar (2001), although we also perform a robustness check on our results substituting the composite Kogut and Singh (1988) index of cultural distance.

Scholars are divided over the Hofstede and Kogut and Singh measures, with some questioning their usefulness, given the datedness and possibly biased nature of the original study (see Shenkar (2001) for a thoughtful critique of the problems inherent in trying to capture 'cultural distance'). Nonetheless, these indices have an established track record in numerous literatures and, while new measures of culture exist, Hofstede's measures (and the related composite index (Kogut and Singh, 1988)) remain the most pervasive in management literature. As such, they are of particular interest in this study, as one aim of the research is to establish to what extent measures of culture are capturing the effects of language. As mentioned earlier, we supplement our use of Hofstede's (1980) indices with other measures.

Industry pressures for local responsiveness was measured with a composite six-item scale, based on variables in Roth and Morrison (1990), inquiring as to the characteristics of the industry. *Percentage of products produced by the plant that are intended for the local market* may also pressure the firm to be locally responsive. Respondents are asked to give an estimate of this figure. The scale used for *autonomy* was based on scales from Taggart (1997) and Ghoshal and Bartlett (1988). *Experience* is captured through five variables ranging in level of specificity: years with the plant, years in that country, other sites in that country, geographic scope of international operations, and years of international operations.

Communication frequency items are based on standard scales with widespread use (e.g., Ghoshal, 1986), capturing multiple media, including remote and face-to-face methods. The plant and firm size are captured through number of employees. *Codifiability*, which can increase the explicit nature of the articulation of the knowledge and thus improve knowledge transfer outcomes (Zollo, 2009), is measured through a scale inquiring directly as to how difficult it is to codify each of the five focal types of knowledge for the respondent's firm. *Source and recipient motivation* are measured directly via single-item variables, asking respondents to indicate their perceptions of each side's motivation to collaborate. The scale for measuring the plant's existing *operational competitive capabilities* comprises items reporting along each of the five operations dimensions. Respondents are also asked to report *plant performance* relative to the worldwide industry average for five accounting measures relevant to operations and used as a standard in many operations studies. Finally, it seems likely that knowledge understanding and ease of knowledge communication will have some effect on one another. When knowledge understanding is low, the lack of comprehension will manifest itself in more effort required to communicate and thereby reduce the ease of communication. Reciprocally, ease of knowledge communication may facilitate understanding, as anxiety has been shown to be negatively correlated with foreign language performance (e.g., Elkhafaifi, 2005; Oya et al., 2004). However, while they may be correlated, it is theoretically and empirically difficult to look for directionality in the relationship. By including each as a control for the other, the analysis accounts for an expected correlation between them and avoids the inflation of other effects.

4.2. Sample

Our context is knowledge transfer between a U.S.-based head office and manufacturing plants located in countries where the unit language of the plants is the dominant language of the country of location and the lingua franca is American English.

The initial pool of U.S.-owned multinationals came from the *Directory of American Firms Operating in Foreign Countries*, which provides data on over 3,000 firms' branches, subsidiaries, and affiliates in other countries. Using the NAICS codes for manufacturing provided a basis for identifying companies likely to have overseas plants. A total of 70 responses (63 usable) were received, reporting on 22 countries: Australia, Belgium, Brazil, China, Costa Rica, Denmark, England, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Mexico, Netherlands, Philippines, Singapore, Spain, Sweden, Thailand, and the United States. We began with two waves of the survey to 1597 potential companies. However, 221 companies were eliminated during the process of the mailing, as returned mail and phone calls revealed that the companies were either out of business or were not of the profile we were soliciting. In-depth follow-up on 400 of the remaining 1376 companies turned up another 128 firms (32% of the 400), that should have been excluded because of having no wholly owned manufacturing plants in the focal countries. This suggests that while the response rate stands at 5%, fully a third of the initial pool of potential companies appear not to fit the criteria for inclusion, making our actual response rate closer to 7%. This response rate is unsurprising given the low reliability of contact

information provided by the *Directory of Corporate Affiliations*, as well as the problem of mail screening, as we were targeting senior executives.

Non-response bias is a concern with a low response rate. However, comparing revenues and employee numbers for the sample firms with figures from an equal number of randomly selected non-responding firms showed no statistical difference. Tests for inter-wave response bias (Armstrong and Overton, 1977) also indicated no statistical difference, suggesting that non-response bias does not appear to be a significant problem.

Our respondents represent a wealth of international operations management experience, with an average of 14 years with their respective firms and one-quarter of them having been stationed in at least one other country. We received responses from senior executives, including 1 president, 2 Chief Operating Officers, 9 Executive or Senior Vice Presidents and 40 Vice Presidents and Directors. Further, these 63 companies represent a wide range of industries and have a mean revenue of \$1.5 billion, making them an economically important group. Tables 1 and 2 present the descriptive statistics and zero-order correlations for all variables, including instruments and controls for all equations.

Although linguistic relatedness was measured outside the survey, common method variance can still be a concern for the measures of normative integration and knowledge transfer. Harman's one-factor test (Podsakoff and Organ, 1986), however, revealed no bias.

The reliability of the measures is an issue fundamental to the design and applicability of scales. Cronbach's alpha tests (see Table 1) revealed strong reliability for all but one of the control variables – industry pressures for local responsiveness. This multi-item variable differs from the others, as it is considered to be a formative index rather than a reflective scale and hence, Cronbach's alpha is not a relevant guide (Diamantopoulos and Siguaw, 2006).

5. Analysis and results

The model being tested includes endogenous dependent variables (i.e., mediating variables). The relatedness of these dependent variables raises the likelihood of cross-equation correlation of error terms. Such correlation can render estimates provided by ordinary least squares methods biased and inconsistent (Shaver, 2005). Two procedures preferred for mediation models are instrumental variable estimation techniques and structural equation modeling. The sample size was insufficient to support model convergence in a confirmatory factor analysis, however. Therefore, we ran the model as a system of equations using three-stage least-squares (3SLS) estimation, an instrumental variable estimation technique that can account for interdependence of variables as well (Judge et al., 1982). The instruments used were checked via simple linear regression to be

Table 1
Descriptive statistics, reliability, and scale items.

	Descriptive statistics					Survey scale reliability	
	N	Mean	Std. dev.	Min	Max	Items	Cronbach's α
Dependent and mediating variables							
Knowledge understanding	59	5.49	0.90	2.50	7.00	8	0.89
Ease of knowledge communication	60	4.90	1.23	2.20	7.00	5	0.84
Normative integration	63	4.54	1.27	1.00	6.75	4	0.83
Independent variables							
Linguistic relatedness ^a	63	4.43	1.99	0.00	7.00	Not survey	
Control variables							
Power distance ^b	63	20.25	15.91	0.00	54.00	Not survey	
Uncertainty avoidance distance ^b	63	23.75	14.21	0.00	51.00	Not survey	
Individualism–collectivism distance ^b	63	36.10	24.42	0.00	76.00	Not survey	
Masculinity–femininity distance ^b	63	16.52	16.58	0.00	57.00	Not survey	
Autonomy	63	3.56	0.70	2.20	4.80	5	0.73
Firm size (ln)	63	6.01	1.64	2.86	9.89	Single item	
Plant size (ln)	63	5.30	1.44	2.30	8.85	Single item	
Entry by merger or acquisition	63	0.40	0.49	0.00	1.00	Single item	
Years of affiliation with plant	63	17.46	13.18	1.00	59.00	Single item	
Years with a country presence	63	24.22	18.40	1.00	100.00	Single item	
Number of other sites in county	63	1.24	1.65	0.00	8.00	Single item	
Years of international experience (ln)	63	3.13	0.79	1.39	4.61	Single item	
Industry pressure for local responsiveness	63	17.60	2.82	11.00	23.00	6	N/A
Percent of products produced for local market	63	0.38	0.32	0.00	1.00	Single item	
Plant's operational competitive capabilities	63	4.88	0.79	2.60	6.60	5	0.61
Plant performance	63	4.43	1.11	1.00	6.40	5	0.80
Communication frequency	63	16.55	4.06	7.00	24.00	5	0.78
Codifiability of knowledge	63	4.56	1.05	2.00	7.00	5	0.79
Plant's motivation to collaborate	63	3.68	1.13	1.00	5.00	Single item	
HQ's motivation to collaborate	63	3.48	1.04	1.00	5.00	Single item	

^a Distance variables with respect to English.

^b Distance variables with respect to the United States.

certain they exhibited the proper relations (i.e., predictors for the mediating variable, but not for the dependent variable in each equation).

6. Results

Table 3 presents the results of the three-stage least squares test. Although the three-stage least-squares R-squared is not well defined and should not be used in statistical tests using R-squared, it is valid as a descriptive measure of goodness of fit. R-squared measures for the model are high, accounting for between 45% and 77% of the variance in the four equations. The first equation of the model tests the effects of linguistic relatedness on normative integration. The second equation tests Hypotheses 1 and 4 for the influence of linguistic relatedness and normative integration on knowledge understanding. The third equation tests Hypotheses 2 and 5, looking at linguistic relatedness and normative integration as factors expected to be correlated with ease of knowledge communication.

Contrary to Hypothesis 1, linguistic relatedness exhibits a sizeable and negative correlation with knowledge understanding ($b = -0.24$, $z = -2.78$, $p < 0.01$). This finding is contrary to the hypothesis and warrants a considered discussion; this discussion follows in the next section, within the context of the full results. Linguistic relatedness does have a sizable positive effect ($b = 0.37$, $z = 1.76$, $p < 0.10$) on ease of knowledge communication, thus supporting Hypothesis 2. Results also support Hypothesis 3 – linguistic relatedness is positively associated with higher levels of normative integration ($b = 0.24$, $z = 2.02$, $p < 0.04$). Linguistic relatedness ranges from 0 to 7 for this sample. Given that normative integration is measured on a scale of 1 to 7 and has a standard deviation of 1.27, a one-unit change in linguistic relatedness produces a change of one-fifth of a standard deviation – a substantial effect size and one that indicates the relevance of language for normative integration.

Hypotheses 4 and 5, which test for mediation via normative integration find mixed results. In support of Hypothesis 4, normative integration shows the expected positive and significant association ($b = 0.43$, $z = 2.01$, $p < 0.05$) with greater knowledge understanding. The relationship between normative integration and understanding is consistent with the arguments advanced and the strength and size of the effect underscore the benefits of such interpersonal efforts at knowledge transfer. Hypothesis 5, which predicts a positive relationship between normative integration and ease of communication is belied by the negative correlation ($b = -0.82$, $z = -2.61$, $p < 0.01$). This relationship may indicate that close association does not necessarily entail easy communication. It is possible, in fact, that greater familiarity and interaction provides greater license to haggle over meaning. We discuss this further in the next section.

Table 3
Three-stage least squares results.

	Dependent variables		
	Normative integration	Knowledge understanding	Ease of knowledge communication
Constant term	2.62 [†]	0.50	0.03
Explanatory variables			
Linguistic relatedness	0.24*	-0.24**	0.37 [†]
Normative integration		0.43*	-0.82**
Knowledge understanding			1.35*
Ease of knowledge communication		0.28	
Control variables			
Autonomy	-0.08		0.04
Power distance	-0.01	0.01	-0.01
Uncertainty avoidance distance	0.00	0.00	-0.01
Individualism–collectivism distance	0.01	-0.01	0.01
Masculinity–femininity distance	0.00	0.00	0.01
Firm size	0.00		
Plant size	0.12		
Entry by merger or acquisition	-0.39		
Years of affiliation with plant	-0.04**	0.01	0.00
Years with a country presence	0.03*		
Number of other sites in country		0.05	
Years of international experience	0.04	-0.12	0.00
Codifiability of knowledge		0.16	0.01
Plant's motivation to collaborate		0.05	0.18
HQ's motivation to collaborate		-0.04	0.06
Communication frequency		-0.02	0.05
Industry pressure for local responsiveness	0.02		
Percentage of products produced for local market	-1.16**	0.17	
Plant's operational competitive capabilities	0.49**	0.24	-0.09
R ²	0.45	0.77	0.47
N	59	59	59

Significance for all variables reported as two-tailed values.

** $p < 0.01$ level.

* $p < 0.05$ level.

[†] $p < 0.10$ level.

Ease of knowledge communication did not show a significant effect on understanding, although the reciprocal relationship was significant, with knowledge understanding showing the expected positive effect on ease of knowledge communication ($b = 1.35$, $z = 2.28$, $p < .05$). The model tests them simultaneously, rather than serially, as the literature does not provide adequate support for hypothesizing about one preceding the other in initial effects.

With respect to the control variables, number of years in the country relates positively to normative integration ($b = 0.03$, $z = 2.53$, $p < 0.05$), while years of affiliation with the specific manufacturing plant has a negative association with ($b = -0.04$, $z = -3.42$, $p < 0.01$), suggesting that as the relationship matures, the plant is accorded greater autonomy. The percentage of products produced for the plant's local market also exhibits a negative relationship with normative integration ($b = -1.16$, $z = -2.86$, $p < 0.01$), perhaps reflecting the plant's focus on its own local market. Plant performance, by contrast, appears to drive efforts at normative integration ($b = 0.49$, $z = 4.29$, $p < 0.01$), as headquarters seeks to learn from its successful operations.

Robustness checks revealed the same relationships between linguistic relatedness and normative integration, knowledge understanding, and ease of knowledge communication, both in the absence of the cultural distance measures and in every combination of them. In addition, tests using other established measures of culture (including the Kogut and Singh (1988) composite index of cultural distance, Hofstede's measures as country scores (rather than distance), the Globe Study (2004) measures, and Hall's (1981) high/low-context dichotomy) failed to change any of the effects of linguistic relatedness on the elements of knowledge transfer. Finally, we ran the model without linguistic relatedness, to test whether it might be diluting possible effects of culture; this occasioned no change to the results. Cultural variables were not significant in any test.

Finally, we note that assigning a single unit language to a plant rests on an assumption of linguistic homogeneity among members. We attempt to limit this by sampling from manufacturing plants located only in countries with a single dominant language. Furthermore, while these plants are likely to include individuals who have emigrated from other countries at some point in time, the firms in our sample report very few foreign postings within the plants. The mean percentage of local employees is 99.13, with only one firm reporting more than 5% non-local employees. A robustness check dropping that particular firm from the sample revealed no differences in the primary relationships of the model.

Taken together, these reported results provide general support for the model of cross-linguistic knowledge transfer in firms with international operations, with one notable exception: the negative correlation of linguistic relatedness with knowledge understanding. The hypothesized relationships account for a significant amount of variance in the equations: 45% of normative integration, 77% of knowledge understanding, 47% of ease of knowledge communication.

7. Discussion

The general claim argued for in this study is that linguistic relatedness will positively affect knowledge transfer between headquarters and international operations, both in terms of more accurate understanding of the knowledge and in the ease with which the knowledge is communicated. Essentially, linguistic non-relatedness is posited as a kind of distance separating the foreign operations from its headquarters; as such, non-relatedness is expected to have deleterious effects on both the communication and relationship, while relatedness should convey a benefit. However, we find that while linguistic relatedness does indeed enhance the ease of knowledge communication, it appears to have a negative effect on knowledge understanding, suggesting a complex relationship between language and knowledge transfer. That having fewer structural linguistic resources in common could actually *increase* the extent to which knowledge is understood seems counterintuitive.

One possible explanation is that, because structural elements of language such as grammar, pronunciation, and vocabulary are such obvious linguistic differences, people know to pay attention to them; this additional attention may actually render knowledge understanding greater than when language is not considered a problem. An example is the Romance languages, which are closely related. Firms located in Italy may expect that knowledge transfer will be easier with a Spanish plant than with a German plant, and therefore be less vigilant in ascertaining whether understanding has occurred in their Spanish plant. Furthermore, when two languages are perceived to be close, there may be less tolerance for lack of communicative competence and people may be hesitant to admit to difficulties.

We must also remember that the survey instrument used here does not measure immediate understanding. Instead, it is headquarters' report on the extent to which subsidiaries understand the knowledge transferred after the fact. The measure, therefore, allows for iterative negotiation of meaning over time. If knowledge understanding is poor on the first attempt, greater effort and more attention may go into subsequent attempts, resulting in greater overall understanding in the end. Furthermore, problems understanding because of accents, grammar, and word choice (in terms of fundamental meaning), present the most salient difficulties in communication with non-native speakers. When such difficulties are apparent, subsidiaries may make greater use of conscious linguistic compensatory strategies (e.g., asking for confirmation or help, paraphrasing, using native language words) and headquarters may be more likely to offer linguistic assistance and check for comprehension (Carroll, 1990; Ellis, 1994; Odlin, 1989).

The positive association between linguistic relatedness and normative integration of the plant receives strong support from the findings. We argue that this is because difficulties – anticipated and real – occasioned by language differences may cause avoidance or suspension of efforts to promote informal relations. Nevertheless, the positive relation between normative integration and knowledge understanding underscores the importance of informal relations, despite the potential difficulties involved in bringing together two linguistic communities.

The support for the role of normative integration efforts is strong. Although its effects on ease of communication proved to be negative, the gains to knowledge understanding counterbalance this finding, thus supporting the soundness of international management theory. Such efforts to encourage participation in the common corporate culture and informal relations promote a milieu for negotiation of meaning and the establishment of norms for communicating.

The negative association between normative integration and ease of knowledge communication may not be as puzzling as it first appears. Splitting normative integration into its two components of integration through corporate culture and through informal interaction provides a more fine-grained analysis. A simple linear regression produces the same directionality and relative significance for all the other variables (compared with the full multiple equation system), but integration via corporate culture has a positive sign and is not significant, whereas integration by informal interaction is significant and negative on ease of knowledge communication. Corporate culture may be providing some commonality and support that render communication easier. Denser informal interaction, by contrast, may throw differences into relief and force the source and recipient units to exert greater effort to communicate the knowledge. It is also possible that close association may make members more comfortable with one another and allow them to express disagreement more freely, making communication of the knowledge more difficult, even though the relationships themselves are strong. Or, it is possible that lacking more personal ties to the plant makes it easier for headquarters to simply impose its will, dictating the knowledge and never questioning or encouraging feedback as to whether the knowledge was understood and accepted.

The lack of significance for any cultural variable – Hofstede's or other – has implications for both the construct of linguistic relatedness and the process of cross-border knowledge transfer. The effects of linguistic relatedness were robust to any change, addition, or deletion of *any* of the established measures of culture. These results suggest that a focus on the structural elements of language does indeed prevent the conflation of the measures of language and culture. With respect to the transfer of knowledge across borders, while various aspects of the process may well be influenced by other facets of culture, those that are primarily a function of communication appear to be most affected by language.

7.1. Linguistic relatedness as a form of distance

The validity of the concept of distance has long been contended, perhaps most notably by Shenkar's (2001) critique of cultural distance – both the construct and its measures. As argued in Zaheer et al. (2012), however, distance as a construct has value and can also have validity if properly conceptualized and measured. Indeed, geographic distance has shown to be a consistently powerful variable (see, for example, Dastidar and Zaheer, 2010; Håkanson and Ambos, 2010) and its measurement validity is difficult to question. We argue that structural linguistic relatedness is another construct whose specificity contributes to its validity. While the ideal might be a construct and measure of linguistic relatedness as a whole, the semantic and pragmatic distinctions between languages are far less tractable. We further suggest that the idea of 'relatedness' alleviates what Shenkar (2001) refers to as the 'illusion of symmetry' that plagues many of the constructs of distance. Relatedness focuses on the benefits of commonalities without making assumptions of equality in how each side is affected by differences.

The second contribution linguistic relatedness makes to our understanding of distance constructs is with specific respect to cultural distance. While a few research papers have included a dichotomous variable for same/different language, that number is regrettably small. Given that many of the various articulations of the culture construct include language in their definitions, it is reasonable to assume that there is widespread belief that culture – and cultural distance – variables will account for the effects of language. However, conceptualizing linguistic relatedness based on structural elements immediately reveals that language and culture do not necessarily behave the same way. For example, linguistically speaking, both Germany and the Netherlands are close to the United States, as both German and Dutch have a high degree of structural linguistic relatedness to English (each is only one node from English on the linguistic family trees). In terms of culture, however, Germany and the Netherlands diverge: the Kogut and Singh (1988) Index (KSI) puts Germany at a cultural distance of 1.6 from the United States, while the Netherlands is at 7.1. Comparing the United States with Costa Rica and Israel produces similarly divergent pictures: Spanish exhibits significantly greater structural relatedness to English than Hebrew (the former has a nodal distance of 3, the latter, 5), yet Costa Rica and the U.S. have a cultural distance of 16.7 while Israel and the U.S. show a distance of only 6.4. Taking these two examples together, we would say that *culturally* Germany is closest to the U.S., followed by Israel, the Netherlands, and finally Costa Rica; *linguistically*, Germany and the Netherlands are equally close to the U.S., then Costa Rica, with Israel the most distant. Thus, our focus on structural linguistic overlap occasioned by linguistic relatedness helps differentiate the effects of language at a very fundamental level from those of culture.

Finally, the findings of this study fit quite well with the view of those who advocate for a less simplistic view of distance in general. Shenkar's (2001) award-winning explication of the 'illusions' of distance brought to the forefront the questionability of many of the assumptions upon which research using distance measures rests. Others have since shed further light on the need for more nuanced treatment of distance. Drogendijk and Holm (2012) expound on the idea of 'cultural positions,' showing that it isn't always just the distance between two groups, but the distance *plus* the characteristics of each group that determine the effects of similarities and differences. Chapman et al. (2008) consider the case of two ostensibly equidistant relationships – Poland/United Kingdom and Poland/Germany – and find that they are not truly equidistant. These authors go on to say that it is perhaps having an understanding of the distance that matters. This may be the most simple and clear explanation for the counterintuitive findings here with respect to smaller linguistic distance being more problematic than greater distance. Differences arising in the case of smaller distance pass under the radar and are less explored and, therefore, less understood. Where differences in the

context of great distance are seen as arising from foundational properties of the group, differences between groups with a small distance may seem idiosyncratic and without understandable basis.

7.2. Contributions to theory and practice

Our work contributes to several different theoretical streams. To the international operations management literature the concept of linguistic relatedness makes an important addition to the construct of culture in explaining cross-border interactions. As discussed earlier, culture plays an undeniably important role in the management of global operations, and may be especially critical in the less understood context of emerging markets such as China (Zhao et al., 2006). Treating culture as a monolithic construct and relying on a relatively small set of established measures, however, does not do justice to the problem. We see linguistic relatedness as bringing in a structural linguistics perspective and serving as a complement to recent work on semantic fit (e.g., Brannen, 2004; Renzl, 2007). Structural linguistics – and in particular our area of focus, syntactics – emphasizes the fundamental structures of language rather than the functional aspects of language concerned with the creation of meaning. We suggest that the value of the structural linguistic approach is that it more clearly differentiates language from culture than do the functional linguistic aspects such as semantics and pragmatics. In addition, it offers an accessible measure of language, making the clarification of the specific effects of language on organizational processes a more tractable task. We draw from theory on foreign language acquisition and use it to develop a nuanced view of how relatedness between the unit languages affect knowledge transfer between headquarters and plant. In this way we also move beyond the simpler dichotomy of same/different language and add to the literature on knowledge transfer.

We also find support for theory with respect to the value of normative integration for knowledge transfer. However, the results suggest that despite this value, salient differences between the subunits – such as unit language – may cause one or both sides to avoid opportunities for normative integration. It thus becomes particularly important for firms with international operations to persist in efforts to promote normative integration across their far-flung units despite obstacles they may face.

Other implications for firms are clear. In his essay “The Forgotten Strategy” (2003), Ghemawat adjures us to make the most of dissimilarity by arbitraging it. It appears that firms can certainly benefit from taking this to heart with respect to language. Here dissimilarity, in the form of lower linguistic relatedness, may make evident the need for greater attention to communication outcomes; knowledge transfer, in turn, benefits from this attention. Conversely, though, linguistic relatedness and the appearance of similarity may be problematic, and firms must be particularly vigilant when transferring knowledge to plants located in countries whose languages are closely related; neither headquarters nor plant managers cannot assume understanding, nor shy away from probing whether knowledge has been truly comprehended.

7.3. Limitations and future directions

There are a number of limitations to this study, the most obvious of which is sample size. However, support for the model is significant, rendering a type 1 error – the usual concern with a small sample size – unlikely. Further, the data come from a wide variety of industries and countries, thus increasing generalizability.

The use of a single headquartering country, while done for purposes of ruling out exogenous effects, also limits the generalizability. The fact that that country is an anglophone country carries some interesting implications. The growing role of English as the lingua franca of business is well established. It is therefore possible that many employees in the manufacturing plants have received, if not education in English as a second language, at least significant exposure to English because of its widespread use in marketing, web sites, etc. On the other hand, English is also an incontrovertibly difficult language to learn. Smith (2005) presents three characteristics of a good lingua franca and why English does not meet them: (1) The degree and types of ambiguity make it difficult to understand; (2) the linguistic distance between it and the language closest to it is still great enough to prevent learnability ease (Smith contrasts English here with Romance languages where each provides a group of ‘natural learners’ for the other); and (3) its linguistic resources are complex: it has a large sound system, making it difficult to master pronunciation; its writing and sound systems do not perfectly correspond; its lexicon is enormous and comprises words borrowed from many other language sources; and finally, there are many word formation and grammatical complexities.

Another limitation posed by the design of the study is that it reports solely on headquarters-outward knowledge transfer. Knowledge flows not only in the other direction, with headquarters often reaping the benefits of its foreign subunits' experience and expertise, but between foreign subunits as well. Ideally we would be able to survey both source and recipient and give equal consideration to cases where the manufacturing plants were the source and headquarters or other plants were the recipients. Potential biases arise also from having a single respondent reporting from one side of a two-sided process. While we aren't asking informants about understanding and ease of communication of specific messages, we are asking for their impressions of how well certain types of knowledge on which the recipients are to act are understood and how easily did the information source find it to communicate that knowledge to the recipients. As such, this data constitutes only one side's view of the knowledge transfer success (in terms of these two outcomes). Therefore it is certainly possible that perceptual biases are at work. However, because we are focusing on the HQ-to-manufacturing-plant knowledge flows, we believe that the perceptions of the HQ upper management are key – not because the perceptions of the recipient manufacturing plants are useful, but because it is the HQ's expectations that must be satisfied. With respect to having only one source, having the single source be from an upper management vantage point might alleviate the bias somewhat, insofar as that level of management would be in a position to report on the source unit's overall satisfaction with the knowledge transfer, but it is undeniable that multiple

respondents would provide a better, more reliable, picture. One design for addressing these issues would be a single-company study where multiple respondents from headquarters and a number of subsidiaries report on both outflows and inflows of knowledge. While this design also has its detractors, this type of triangulation would provide a means of validating the current study. In addition, this would provide a means of capturing the effects of linguistic heterogeneity within subunits on interunit knowledge transfer.

Relationships among the gamut of cultural measures need a great deal of further scrutiny. Undoubtedly culture and language are intertwined, and sorting out their differential effects on organizational processes makes a valuable contribution to the field. Future work extending this line of inquiry might focus on developing measures of semantic and pragmatic relatedness, as well as comparing the effects of linguistic and cultural relatedness in other communication-bound processes.

8. Concluding remarks

It is evident that, while linguistic relatedness provides a finer grained tool than the simplistic same language/different language dichotomy, it operates in some unexpected ways and offers some useful insights. First, the relationship between linguistic relatedness and knowledge understanding appears to support the ‘psychic distance paradox’ (O’Grady and Lane, 1996), where similarities lead to sense of complacency and an underappreciation of critical – if subtle – differences. Also, while low linguistic relatedness makes normative integration difficult in the multinational enterprise, the knowledge transfer payoff from normative integration is especially worthwhile, perhaps even more so than in a mono-linguistic context. Additionally, results from this research lend support to the idea that language and culture are not synonymous. While they are undeniably related, differences in their effects on normative integration and on knowledge-related outcomes suggest that these two constructs may operate differently across a range of organizational processes.

A final takeaway from this research is that Shenkar (2001) is well justified in his warnings about the complexity of distance. To begin with, the findings of this study support the idea that different aspects of distance are critical in different circumstances. It is therefore crucial to select constructs and measures relevant to the focal process. Finally, we show that distance need not always be a bad thing. In the case of language, there are instances when distance can lead to better ultimate outcomes, because of the greater effort and attention accorded when language differences are obvious.

References

- Adler, N.J., 2002. *International Dimensions of Organizational Behavior*, 4th ed. South-Western Publishing, Cincinnati, Ohio.
- Ahmad, S., Schroeder, R.G., 2002. Dimensions of competitive priorities: are they clear, communicated, and consistent? *J. Appl. Bus. Res.* 18 (1), 77–86.
- Almeida, P., Phene, A., 2004. Subsidiaries and knowledge creation: the influence of the MNC and host country on innovation. *Strateg. Manage. J.* 25 (8/9), 847–864.
- Ambos, T.C., Ambos, B., 2009. The impact of distance on knowledge transfer effectiveness in multinational corporations. *J. Int. Manage.* 15 (1), 1–14.
- Appleyard, M., 1996. How does knowledge flow? Interfirm patterns in the semiconductor industry. *Strateg. Manage. J.* 17 (Winter Special Issue), 137–154.
- Argote, L., McEvily, B., Reagans, R., 2003. Managing knowledge in organizations: an integrative framework and review of emerging themes. *Manage. Sci.* 49 (4), 571–582.
- Armstrong, G., Kaplowitz, S., 2001. Sociolinguistic inference and intercultural coorientation: a Bayesian model of communicative competence in intercultural interaction. *Hum. Commun. Res.* 27 (3), 350–381.
- Armstrong, J.S., Overton, T.S., 1977. Estimating non-response bias in mail surveys. *J. Mark. Res.* 14 (3), 396–402.
- Arrow, K.J., 1974. *The Limits of Organization*. Norton, New York.
- Barner-Rasmussen, W., Bjorkman, I., 2005. Surmounting interunit barriers: factors associated with interunit communication intensity in the multinational corporation. *Int. Stud. Manage. Organ.* 35 (1), 28–46.
- Barner-Rasmussen, W., Bjorkman, I., 2007. Language fluency, socialization and inter-unit relationships in Chinese and Finnish subsidiaries. *Manage. Organ. Rev.* 3 (1), 105–128.
- Bialystok, E., 1990. *Communication Strategies: A Psychological Analysis of Second Language Use*. Blackwell, Cambridge, MA.
- Bjorkman, A., Piekkari, R., 2009. Language and foreign subsidiary control: an empirical test. *J. Int. Manage.* 15 (1), 105–117.
- Brannen, M.Y., 2004. When Mickey loses face: recontextualization, semantic fit, and the semiotics of foreignness. *Acad. Manage. Rev.* 29 (4), 593–616.
- Bresman, H., Birkinshaw, J., Nobel, R., 1999. Knowledge transfer in international acquisitions. *J. Int. Bus. Stud.* 30 (3), 439–462.
- Buckley, P.J., Carter, M.J., Clegg, J., Tan, H., 2005. Language and social knowledge in foreign-knowledge transfer to China. *Int. Stud. Manage. Organ.* 35 (1), 47–65.
- Cai, S., Jun, M., Yang, Z., 2010. Implementing supply chain information integration in China: the role of institutional forces and trust. *J. Oper. Manage.* 28 (3), 257–268.
- Carroll, J.B., 1990. Cognitive abilities in foreign language aptitude: then and now. In: Parry, T.S., Stansfield, C.W. (Eds.), *Language Aptitude Reconsidered*. Prentice Hall, Englewood Cliffs, NJ.
- Chapman, M., Gajewska-De Mattos, H., Clegg, J., Buckley, P.J., 2008. Close neighbors and distant friends—perceptions of cultural distance. *Int. Bus. Rev.* 17, 217–234.
- Chini, T.C., 2004. *Effective Knowledge Transfer in Multinational Corporations*. Palgrave Macmillan, New York.
- Chomsky, N., 1965. *Aspects of the Theory of Syntax*. MIT Press, Cambridge, MA.
- Chomsky, N., 1980. *Rules and Representations*. Columbia Univ. Press, New York.
- Collins, C.J., Smith, K.G., 2006. Knowledge exchange and combination: the role of human resource practices in the performance of high-technology firms. *Acad. Manage. J.* 49 (3), 544–560.
- Comrie, B., 1989. *Language Universals and Linguistic Typology: Syntax and Morphology*, 2nd ed. Blackwell, Oxford.
- Comrie, B., 2003. Languages of the world. In: Aronoff, M., Rees-Miller, J. (Eds.), *Handbook of Linguistics*. Blackwell, Malden, MA.
- Cousins, P.D., Menguc, B., 2006. The implications of socialization and integration in supply chain management. *J. Oper. Manage.* 24 (5), 604–620.
- Croft, W., 2003. *Typology*. In: Aronoff, M., Rees-Miller, J., Malden, M.A. (Eds.), *Handbook of Linguistics*. Blackwell, Malden, MA.
- Crystal, D., 1997. *The Cambridge Encyclopedia of Language*, 2nd ed. Cambridge Univ. Press, Cambridge.
- Dastidar, P., Zaheer, S., 2010. Dealing with information asymmetry in cross-border acquisitions: distance matters. Best Paper Proceedings, Academy of Management Annual Meeting, Montreal, Canada.
- De la Torre, J., Toyne, B., 1978. Cross-national managerial integration: a conceptual model. *Acad. Manage. Rev.* 3 (3), 462–474.
- Diamantopoulos, A., Siguaw, J.A., 2006. Formative versus reflective indicators in organizational measure development: a comparison and empirical illustration. *Br. J. Manage.* 17 (4), 1–20.
- Drogendijk, R., Holm, U., 2012. Cultural distance or cultural positions? Analysing the effect of culture on the HQ-subsidiary relationship. *Int. Bus. Rev.* 21, 383–396.

- Earley, P.C., Mosakowski, E., 2000. Creating hybrid team cultures: an empirical test of transnational team functioning. *Acad. Manage. J.* 43 (1), 26–49.
- Egelhoff, W.G., 1982. Strategy and structure in multinational corporations: an information-processing approach. *Adm. Sci. Q.* 27 (3), 435–458.
- Elkhafaifi, H., 2005. Listening comprehension and anxiety in the Arabic language classroom. *Mod. Lang. J.* 89 (2), 206–220.
- Ellis, R., 1994. *The Study of Second Language Acquisition*. Oxford Univ. Press, Oxford.
- Fiol, C., 2002. Capitalizing on paradox: the role of language in transforming organizational identities. *Organ. Sci.* 13 (6), 653–666.
- Flynn, B.B., Saladin, B., 2006. Relevance of Baldrige constructs in an international context: a study of national culture. *J. Oper. Manage.* 24 (5), 583–603.
- Foreign Service Institute, 2004. *Language Continuum*. U.S. Department of State Publications.
- Fredriksson, R., Barner-Rasmussen, W., Piekari, R., 2006. The multinational corporation as a multilingual organization. *Corp. Commun.* 11 (4), 406–423.
- Galbraith, J.R., 1977. *Organization Design*, 1st ed. Addison-Wesley Longman, Inc., Reading, MA.
- Ghemawat, P., 2003. The forgotten strategy. *Harv. Bus. Rev.* 81 (11), 76–84.
- Ghoshal, S., 1986. *The innovative multinational: A differentiated network of organizational roles and management processes (HQ-subsidiary relation)*. Unpublished doctoral dissertation, Harvard Bus. School, Harvard Univ., Boston, MA.
- Ghoshal, S., Bartlett, C.A., 1988. Creation, adoption, and diffusion of innovations by subsidiaries of multinational corporations. *J. Int. Bus. Stud.* 19 (3), 265–388.
- Grimes, B.F., 1992. *Ethnologue: Languages of the World*. Summer Institute of Linguistics, Dallas.
- Gupta, A.K., Govindarajan, V., 2000. Knowledge flows within multinational corporations. *Strateg. Manage. J.* 21 (4), 473–496.
- Häkanson, L., Ambos, B., 2010. The antecedents of psychic distance. *J. Int. Manage.* 16 (3), 195–210.
- Hall, E.T., 1981. *Beyond Culture*. Anchor Books, Garden City, NY.
- Hart-Gonzales, L., Lindemann, S., 1993. *Expected Achievement in Speaking Proficiency*. Foreign Services Institute, U.S. Department of State.
- Harzing, A.-W., 2002. Acquisitions versus greenfield investments: international strategy and management of entry modes. *Strateg. Manage. J.* 23 (3), 211–227.
- Hofstede, G., 1980. *Culture's Consequences: International Differences in Work-Related Values*. Sage, Newbury Park, CA.
- House, R., Hanges, P., Javidan, M., Dorfman, P., Gupta, V. (Eds.), 2004. *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies*. Sage, Thousand Oaks, CA.
- Hymers, S.H., 1976. *The International Operations of National Firms: Study of Direct Foreign Investment*. MIT Press, Cambridge, MA.
- Judge, G.G., Hill, R.C., Griffiths, W., Lutkepohl, H., Lee, T.C., 1982. *Introduction to the Theory and Practice of Econometrics*. John Wiley and Sons, New York.
- Kaushanskaya, M., 2007. *Linguistic and cognitive mechanisms in foreign vocabulary acquisition*. Unpublished doctoral dissertation, Northwestern Univ., Evanston, IL.
- Kogut, B., Singh, H., 1988. The effect of national culture on the choice of entry mode. *J. Int. Bus. Stud.* 19 (3), 411–432.
- Kogut, B., Zander, U., 1992. Knowledge of firm, combinative capabilities, and the replication of technology. *Organ. Sci.* 3 (3), 383–397.
- Kostova, T., 1996. *Success of the transnational transfer of organizational practices within multinational companies*. Unpublished doctoral dissertation, University of Minnesota, Minneapolis, MN.
- Luo, Y., Shenkar, O., 2006. The multinational corporation as a multilingual community: language and organization in a global context. *J. Int. Bus. Stud.* 37 (3), 321–339.
- Makela, K., Kalla, H.K., Piekari, R., 2007. Interpersonal similarity as a driver of knowledge sharing within multinational corporations. *Int. Bus. Rev.* 16 (1), 1–22.
- Milton, L.P., Westphal, J.D., 2005. Identity confirmation networks and cooperation in work groups. *Acad. Manage. J.* 48 (2), 191–212.
- Moingeon, B., Soenen, G. (Eds.), 2002. *Corporate and Organizational Identity: Integrating Strategy, Marketing, Communication and Organizational Perspectives*. Routledge, Chicago.
- Morris, C., 1946. *Signs, Language, and Behavior*. Prentice-Hall, New York.
- Naor, M., Linderman, K., Schroeder, R., 2010. The globalization of operations in Eastern and Western countries: unpacking the relationship between national and organizational culture and its impact on manufacturing performance. *J. Oper. Manage.* 28, 194–205.
- Nonaka, I., 1994. A dynamic theory of organizational knowledge creation. *Organ. Sci.* 5 (1), 14–37.
- Nonaka, I., Takeuchi, H., 1995. *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press, New York.
- O'Grady, S., Lane, H.W., 1996. The psychic distance paradox. *J. Int. Bus. Stud.* 27 (2), 309–333.
- Odlin, T., 1989. *Language Transfer*. Cambridge University Press, Cambridge, MA.
- Oya, T., Manalo, E., Greenwood, J., 2004. The influence of personality and anxiety on the oral performance of Japanese speakers of English. *Appl. Cogn. Psychol.* 18 (7), 841–855.
- Podsakoff, P.M., Organ, D.W., 1986. Self-reports in organizational research: problems and prospects. *J. Manage.* 12 (4), 531–544.
- Renzl, B., 2007. Language as a vehicle of knowing: the role of language and meaning in constructing knowledge. *Knowl. Manage. Res. Pract.* 5 (1), 44–53.
- Ronen, S., 1986. *Comparative and Multinational Management*. Wiley, New York.
- Ronen, S., Shenkar, O., 1985. Clustering countries on attitudinal dimensions: a review and synthesis. *Acad. Manage. Rev.* 10 (3), 435–454.
- Roth, K., Morrison, A., 1990. An empirical analysis of the integration-responsiveness framework in global industries. *J. Int. Bus. Stud.* 21 (4), 541–564.
- Ruhlen, M., 1994. *On the Origin of Languages: Studies in Linguistic Taxonomy*. Stanford Univ. Press, Stanford, CA.
- Samovar, L.A., Porter, R.E., Jain, N.C., 1981. *Understanding Intercultural Communication*. Wadsworth, Belmont, CA.
- Shannon, C.E., Weaver, W., 1949. *The Mathematical Theory of Communication*. University of Illinois Press, Urbana, IL.
- Shaver, J.M., 2005. Testing for mediating variables in management research: concerns, implications, and alternative strategies. *J. Manage.* 31 (3), 330–353.
- Shenkar, O., 2001. Cultural distance revisited: towards a more rigorous conceptualization and measurement of cultural differences. *J. Int. Bus. Stud.* 32 (3), 519–535.
- Shenkar, O., Luo, Y., Yeheskel, O., 2008. From “distance” to “friction”: Substituting metaphors and redirecting intercultural research. *Academy of Management Review* 33 (4), 905–923.
- Siemsen, E., Roth, A.V., Balasubramanian, S., Anand, G., 2009. The influence of psychological safety and confidence in knowledge on employee knowledge sharing. *Manuf. Serv. Oper. Manage.* 11 (3), 429–447.
- Smith, R., 2005. Global English: gift or curse? *Engl. Today* 21 (2), 56–62.
- Sperber, D., Wilson, D., 1995. *Relevance*, 2nd ed. Blackwell, Cambridge, MA.
- Sunaoshi, Y., Kotabe, M., Murray, J.Y., 2005. How technology transfer really occurs on the factory floor: a case of a major Japanese automotive die manufacturer in the United States. *J. World Bus.* 40 (1), 57–70.
- Szulanski, G., 1996. Exploring internal stickiness: impediments to the transfer of best practice within the firm. *Strateg. Manage. J.* 17 (Winter Special Issue), 27–43.
- Taggart, J.H., 1997. Autonomy and procedural justice: a framework for evaluating subsidiary strategy. *J. Int. Bus. Stud.* 28 (1), 51–76.
- Van Valin, R.D., 2003. *Functional linguistics*. In: Aronoff, M., Rees-Miller, J. (Eds.), *Handbook of Linguistics*. Blackwell, Malden, MA.
- Voegelin, C.F., Voegelin, F.M., 1977. *Classification and Index of the World's Languages*. Elsevier, New York.
- Welch, D.E., Welch, L.S., 2008. The importance of language in international knowledge transfer. *Manage. Int. Rev.* 48 (3), 339–360.
- Welch, D., Welch, L., Piekari, R., 2005. Speaking in tongues. *Int. Stud. Manage. Organ.* 35 (1), 10–27.
- West, J., Graham, J.L., 2004. A linguistic-based measure of cultural distance and its relationship to managerial values. *Manage. Int. Rev.* 44 (3), 239–260.
- Willis, G.B., 2005. *Cognitive Interviewing: A Tool for Improving Questionnaire Design*. Sage, Thousand Oaks, CA.
- Zaheer, S., 1995. Overcoming the liability of foreignness. *Acad. Manage. J.* 38 (2), 341–363.
- Zaheer, S., Spring Schomaker, M., Nachum, L., 2012. Distance without direction: restoring credibility to a much-loved construct. *J. Int. Bus. Stud.* 43, 18–27.
- Zhao, X., Flynn, B.B., Roth, A.V., 2006. Decision sciences research in China: a critical review and research agenda — foundations and overview. *Decis. Sci.* 37, 451–496.
- Zollo, M., 2009. Superstitious learning with rare strategic decisions: theory and evidence from corporate acquisitions. *Organ. Sci.* 20 (5), 894–908.
- Zu, X., Robbins, T.L., Fredendall, L.D., 2010. Mapping the critical links between organizational culture and TQM/Six Sigma practices. *Int. J. Prod. Econ.* 123 (1), 86.