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# Formal and informal interorganizational learning within strategic alliances

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ABSTRACT

Learning behaviors of employees can be either formalized (in the form of programmed events and visits) or informal (in the form of spontaneous interaction and knowledge sharing). We investigate the effect that both types of learning behaviors have on interorganizational learning of substantive knowledge in the context of an alliance. We also look at the effects that the two forms of learning behavior have on each other. We find that while informal learning behaviors have a consistently positive effect on the learning outcome and on formal learning behaviors, this is not so for formal learning behaviors. The effect of formal behaviors on both learning outcome and informal behaviors, while positive, diminishes at higher levels. This leads us to conclude that although both informal and formal learning behaviors foster interorganizational learning, too much formalization obstructs learning. Similarly, while formally programmed behaviors do encourage informal learning behaviors of the boundary spanners, an excess of formalization stifles them.



## 1. Introduction

Over the past 20 years, strategic alliances – encompassing a broad range of contractual forms, from arm's-length contracts to equity joint ventures (Gulati and Gargiulo, 1999) – have become an increasingly common ingredient of corporate strategy (Muthusamy and White, 2005). By creating conditions conducive to knowledge sharing, strategic alliances have come to be considered a particularly suitable context for organizations to access and share organizationally embedded knowledge-based resources (Hall, 1992; Inkpen, 1997; Powell et al., 1996). This is especially so for global and multinational corporations, in which cross-border transfer of substantive (e.g., technological, managerial, market) knowledge is crucial to sustaining competitiveness (Bhagat et al., 2002).

In this paper we explore the issue of what drives the interorganizational learning of substantive knowledge. Drawing on social learning theory, we argue that the flow of knowledge between alliance partners results from interactions between boundary spanners of the allying organizations. Such learning behaviors can be of informal or formal character and vary in their effect on interorganizational learning. This issue is at the core of this paper. Informal learning behaviors are reflected in informal interactions that arise naturally between boundary spanners of collaborating partners. This learning is not restricted by organizational boundaries (Wenger et al., 2002) and, in fact, interorganizational knowledge flows sometimes occur against the wishes of the organizational strategy makers who would rather contain the knowledge in-house. Conversely, there are circumstances where interorganizational learning does not emerge spontaneously, even though this would be desirable. This may occur, for example, if informal contacts between practitioners from the collaborating organizations are in some way limited or where cultural misalignment impedes interaction. Where interorganizational learning is insufficient from the point of view of the

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partners involved, knowledge sharing across the partners' organizational boundaries can be encouraged and managed.

This is easier said than done, however. Although structural measures – making resources available or formalizing learning interactions – can stimulate interorganizational learning, it is uncertain whether they are as effective in achieving knowledge flows as the informal learning behaviors. Managerially induced learning behaviors may positively affect interorganizational learning, but too much formalized interaction may also stifle learning. Hence, in their efforts to stimulate interorganizational learning, managers of allying firms need to take care to strike a balance between relying on spontaneously emerging informal behaviors of boundary spanners on the one hand, and on purposefully designed formal interactions on the other. The situation is further complicated as the informal and formal learning behaviors, rather than being independent, are also likely to influence each other. On the one hand, formally arranged interactions may induce additional informal interaction of the boundary spanners, while on the other hand, spontaneous behaviors by organization members can also lead to structural responses from (top) management in the form of formalized interactions. For this reason, when considering interorganizational learning one needs to simultaneously account for informal learning behaviors and formally programmed learning behaviors in their dynamic interplay. Consequently, the central question in this paper is: what is the effect of formal interactions between boundary spanners designed by alliance management and informal behaviors of the partners' employees on interorganizational learning outcomes within an alliance, as well as on each other.

The importance of formal and informal interactions of individuals for organizational learning has been asserted in the literature. So far, however, research on alliances has predominantly focused on the organizational structural aspects of collaboration, while much less attention has been paid to individual and social processes (Doz, 1996; Salk and Simonin, 2003). In particular, studies focusing on interactions of individuals and social processes are very rare in general alliance management literature (e.g., Luo, 2001) as well as in interorganizational knowledge transfer literature (e.g., Darr et al., 1995), and are to be found mostly outside the mainstream journals (Salk and Simonin, 2003). However, the role of individual interactions, both formal and informal, in organizational learning is critical (Pak and Snell, 2003). Thus, we contribute to the literature on interorganizational learning not only through our focus on the role of informal boundary spanner (i.e., individual) interactions in accomplishing learning in an alliance context but also by considering these informal behaviors in parallel with more formal behaviors induced by (top) management.

In the following section, we present our definition of interorganizational learning within alliances as used in this paper, highlighting the crucial role of social interactions between boundary spanners. Next, we draw on the social learning literature to discuss the roles of informal social interactions between boundary spanners, i.e., *informal learning behaviors*, and social interactions between boundary spanners that have been programmed by the alliance management, i.e., *formal learning behaviors*. Subsequently, we formulate hypotheses with respect to the effects of informal learning behaviors and formal learning behaviors on interorganizational learning outcomes. Finally, we discuss how these two forms of social interactions influence each other and formulate hypotheses accordingly. We have tested all our predictions on a sample of Polish-foreign joint ventures operating in Poland. After presenting the results, we conclude the paper with a discussion of the main theoretical and practical implications of our findings, the limitations of our research, and suggestions for future studies.

## 2. Interorganizational learning within alliances

Organizations can gain knowledge from their own experience (Huber, 1996; Levitt and March, 1996) or acquire it externally (Von Krogh et al., 2001). We turn our attention to the latter case, to a situation where one organization acquires knowledge from another organization, its alliance partner in specific (Huber, 1996; Levitt and March, 1996), and define that as the process of interorganizational learning. Strategic alliances are considered to be a particularly suitable context for partners to access and share each other's knowledge-based, organizationally embedded and often tacit resources that lie at the core of a firm's competitive advantage (Barney, 1991; Hall, 1992; Hamel, 1991; Inkpen, 1997; Kogut, 1988; Powell et al., 1996). Whether or not the partners take advantage of this opportunity is another question.

Knowledge accrued by partners through an alliance can be of various types. Partners acquire knowledge that may be helpful in collaborative relationships in general, i.e., collaborative know-how (Inkpen and Tsang, 2005; Lyles, 1988) as well as partner-specific knowledge, which can be of crucial importance for how the collaboration develops (Ariño and De la Torre, 1998; Inkpen and Tsang, 2005). Relevant in the context of alliances is also the substantive knowledge that partners use in achieving their business objectives, e.g., technological, managerial know-how, and market knowledge. Such substantive knowledge can have two sources. On the one hand, partners can learn together in the course of collaboration, and jointly develop new capabilities and skills (Inkpen and Tsang, 2005; Tiemessen et al., 1997). On the other hand, each of the partners can bring such knowledge into the collaboration, thus giving the other an opportunity to access competencies and skills developed and acquired prior to entering into the focal collaboration (Inkpen and Tsang, 2005; Kogut, 1988). The focus of this paper is on the last two types of knowledge, i.e., substantive knowledge acquired from or jointly developed with a collaboration partner.

Such knowledge, just like any other type of knowledge, is likely to have both an explicit and a tacit component (Polanyi, 1962). Different views exist with regard to the relationship between explicit and tacit knowledge (see e.g., Brown and Duguid, 2001; Nonaka and Takeuchi, 1995; Tsoukas, 2003), but there is an agreement that sharing tacit knowledge, or the tacit component of knowledge, is

much more difficult than sharing of its explicit counterpart (Kale et al., 2000; Martin and Salomon, 2003; Polanyi, 1962). Since all knowledge has a tacit dimension, constituting a bottleneck with regard to its sharing, in considering learning in alliances it is necessary to pay particular attention to the conditions that assure the transfer of the tacit component of knowledge. This is even more so since effective sharing of the explicit component of knowledge requires that the tacit component be shared first (Brown and Duguid, 2001, p. 205).

Tacit components of knowledge "cannot be 'captured', 'translated', or 'converted', but only displayed and manifested, in what we do" (Tsoukas, 2003, p. 410). Tacit knowledge is knowledge that has not "been reduced to symbolic representations (code)" and which is held "in forms that are not readily available for communication to others—at least not explicitly as 'information-bearing' messages" (Cowan et al., 2000, p. 217). The importance of tacit knowledge implies that the learning process cannot be restricted to an exchange of documents and other impersonal bearers of information. Instead social interactions between individual members of the collaborating organizations are necessary to allow an exchange of the tacit component of knowledge. This points to the central role of boundary spanners, i.e., organizational members responsible for processing information from the partner organization and representing their organization in the collaborative relationship (Aldrich and Herker, 1977; Perrone et al., 2003) and their interactions in the interorganizational learning within alliances.

Classic literature on boundary-spanners stresses the crucial role of individuals and groups, as the "conduits of, or sensors for learning and knowledge" in enabling flows of knowledge across organizational boundaries (Salk and Simonin, 2003, p. 260, see also Aldrich and Herker, 1977; Jemison, 1984; Keller and Holland, 1975). In particular, it has been argued that the transferal of tacit knowledge across organizational boundaries requires "close and intense interaction between individual members of the concerned organizations" (Kale et al., 2000, p. 221). Dahl and Pedersen (2004)'s study of engineers shows how highly relevant work-related knowledge is exchanged between organizations through the engineers' social contacts. The upshot is that in studying interorganizational learning within alliances, we need to focus on social interaction between boundary spanners of the organizations involved. In the next section we will turn to the social learning approach to organizational learning for a discussion of two forms of social interactions that may be assumed to play a role in this process.

## 3. Informal and formal learning behaviors

The aim of this paper is to better understand the role of informality as opposed to more formal procedures in the process of interorganizational learning. Bearing in mind the pivotal role of social interactions in sharing the tacit element of knowledge, we distinguish between informal social contacts between the boundary spanners, i.e., *informal learning behaviors*, and social interactions of boundary spanners programmed by the alliance management, i.e., *formal learning behaviors*. This distinction is rooted in classic literature on organizational learning.

Two divergent perspectives on organizational learning can be identified in extant literature; one is reflective of the social learning theory while the other is more bureaucratic in character (Contu et al., 2003). This is particularly clear in the work of Wenger (Lave and Wenger, 1991; Wenger, 1998; Wenger et al., 2002), in which "community of practice" (CoP) is a central concept. CoPs are described as "emergent", "informal" (Wenger, 1998, pp. 96 and 118) and characterized by "collegiality [and] reciprocity" (Wenger, 2000, p. 243). At the same time, they are explicitly contrasted with more formal management structures, such as "institutional affiliations, divisions and boundaries" (Wenger, 1998, p. 119) and "authority, or commitment to a predefined deliverable" (Wenger, 2000, pp. 243–244). This contrast between informality, spontaneity, collegiality and voluntariness and the more bureaucratic aspects of organization when it comes to organizational learning is not unique to Wenger's work. Brown and Duguid (1991, p. 53) also explicitly contrast the informal, "rich, full-blooded activities" over "canonical abstractions of practice" in the form of manuals, training courses, and formal job descriptions. Importantly, however, extant literature suggests that organizational learning should not be assumed to be driven exclusively by either informality or structure only (Contu et al., 2003). Instead, the question of the extent to which organizational learning is the outcome of informality or of structure and proceduralization should be explored more thoroughly, both theoretically and empirically (Contu and Willmott, 2003).

There is some empirical evidence that organizational learning does indeed come in different forms and that these forms are related to the distinction described above. In an exploratory qualitative study of organizational learning in three organizations, Pak and Snell (2003) identify three different learning processes: spontaneous organizational learning, autonomous-formal organizational learning, and programmed organizational learning. Spontaneous organizational learning is characterized by ad hoc, informal interactions in an atmosphere of warmth and collegiality. The role of higher management is restricted to "respect and allow to happen" (Pak and Snell, 2003, p. 285). Autonomous-formal organizational learning "refers to free expression and exchange of views" that takes place in the context of official meetings (Pak and Snell, 2003, p. 282). The main difference with regard to spontaneous learning is that the setting in which it takes place is orchestrated by management; nevertheless, the emphasis is on the open exchange of ideas. At the other end, Pak and Snell identify programmed organizational learning: standardized, formal, one-way transmission of canonical knowledge, enforced through the positional authority of the teacher over the learner. Such a form of learning is probably less suited for the sharing of tacit knowledge.

While spontaneous organizational learning resembles learning within communities of practice as described by Wenger, and our concept of informal learning behaviors of boundary spanners, the other two forms identified by Pak and Snell lie closer to the structure end of the continuum, and to our concept of formal learning behaviors

that captures social interactions of boundary spanners programmed by the alliance management. Interestingly, the findings of Pak and Snell (2003) suggest that autonomous-formal learning is synergetic with spontaneous learning, but programmed learning is antagonistic to both other types. Given the exploratory nature of their study, the authors call for additional research while explicitly focusing attention on the question how spontaneous and autonomous-formal learning complement one another in learning across organizational communities.

Turning now to learning in interorganizational context, although informal learning behaviors may occur spontaneously between boundary spanners, this can be expected to be more difficult compared to an intra-organizational context. In an interorganizational context, interactions between boundary spanners of the alliance partners – especially if the alliance spans national borders – are likely to be more limited, thus making the spontaneous informal learning behaviors more difficult. Furthermore, meanings and interpretations tend to be specific to an organization and thus not easily shared across organizational boundaries. The alignment of cultural elements is likely to be even more problematic if partners originate from different national cultures and do not speak the same language (Elkjaer, 2003; Welch et al., 2005). The weaker alignment of organizational and national cultures of the partners is also likely to hinder the development of a common identity, important for learning to occur.

In short, while interorganizational learning may be accomplished by way of informal learning behaviors, there is no guarantee that such behaviors will emerge spontaneously. Where informal social interactions of boundary spanners from the two allying organizations do not emerge, and the flow of knowledge is thus impeded, alliance partners can take measures to promote interorganizational learning. Specifically, alliance partners may orchestrate contacts and interactions between their boundary spanners. For example, managers of the collaborating partners may organize periodical meetings for engineers with the same specialty (for example, test engineers) from their respective organizations. Such social interactions allow the engineers to share their knowledge and experience with each other. Other structural mechanisms of interorganizational learning include joint projects, reciprocal visits, or joint training activities (cf. Thompson, 2005). In fact, the very act of setting up an alliance may be viewed as a means of bringing together boundary spanners from two organizations with the purpose of sharing knowledge that is "distributed among various actors, and embedded in organizational routines" (Segrestin, 2005, p. 659). In light of the above, we undertake to investigate the effect both structure *and* informality has on interorganizational learning (cf. Contu and Willmott, 2003) and *on each other* (cf. Pak and Snell, 2003).

## 4. Effect of learning behaviors on interorganizational learning outcome

The above discussion concerning the role of informal and formal social interactions between boundary spanners sheds light on the process of interorganizational learning. In specific it suggests that learning in the alliance context can be conceived of as a function of both informal behaviors of individual boundary spanners of the alliance partners as well as formal interactions between boundary spanners that are orchestrated by the alliance management, where the latter do not depend on the intrinsic motivation or spontaneity of the boundary spanners. Hence, our primary argument is that understanding interorganizational learning calls for the consideration of informal learning behaviors of the partners' boundary spanners *in combination* with the formal learning behaviors that encompass social interactions between boundary spanners orchestrated by the management.

The informal learning behaviors capture the intrinsically motivated behaviors of the boundary spanners that lead to interorganizational learning (cf. Salk and Simonin, 2003; Shrivastava, 1983; Szulanski, 1996). This therefore encompasses the intrinsically motivated knowledge sharing of the collaborating partners' employees as well as the sharing of knowledge about their common practice, resulting from the informal social contacts that they initiate outside of the requirements of the collaborative tasks (Dahl and Pedersen, 2004). The importance of informal learning behaviors of individuals in accomplishing interorganizational learning, particularly as far as tacit knowledge is concerned, can hardly be overestimated. As we mentioned above, from the social learning perspective the learning of tacit knowledge "happens among and through other people" (Elkjaer, 2003, p. 43), as they observe and emulate each other in the process of being involved in a shared task. From that perspective, the intrinsic motivation of the individuals to engage in observing and emulating each other is of utmost importance. We expect that such informal learning behaviors will have a positive effect on the learning outcome in the interorganizational setting. This is in line with prior research that has found that intrinsically motivated knowledge sharing and informal social contacts are a good determinant of interorganizational knowledge flows (Dahl and Pedersen, 2004).

However, we do not expect the effect of informal learning behaviors on interorganizational learning outcome to be consistently positive. Rather, we propose that at higher levels of spontaneous learning behaviors, their positive effect on interorganizational learning outcome is likely to diminish. This expectation may seem counterintuitive at first. However, overly intensive interaction between the boundary spanners of collaborating organizations sometimes results in an inward communicative focus (Thompson, 2005). In Thompson's (2005, p. 160) case study, the intensity of the participants' identification with the group in which learning took place "began to isolate them from the commercial realities of their industry sector and the wider organization with which they needed to work". Similarly, Pak and Snell (2003, p. 282) found that "subcultures facilitating sharing *within* communities of practice may have blocked intercommunication *across* them". This suggests that interorganizational boundary spanners need to remain involved with their own organization while working intensively with colleagues from the partner organization. The informal learning behaviors may therefore be expected to know an optimum, above which their positive

effect on interorganizational learning will start diminishing and may even become negative.

**Hypothesis 1.** The effect of informal learning behaviors on interorganizational learning will take the form of an inverted-U relationship.

In line with our earlier arguments, in the alliance context informal learning cannot be taken for granted. Where the wide-ranging, continuous, face-to-face interactions between individual members of the alliance partners, necessary for the sharing and joint development of tacit knowledge, do not occur naturally, they may require purposefully orchestrated interactions between boundary spanners. In specific, partners can arrange for interactions between their boundary spanners to occur, thus programming the desired "boundary encounters" (cf. Wenger, 1998) with the aim of accomplishing the desired level of interorganizational learning. Inkpen and Dinur (1998) have shown that structured and planned social interactions between individuals have a positive impact on knowledge sharing between organizations. Such programmed contacts between members of both organizations, by engendering ongoing, intense, face-to-face interactions between individual members of the partner organizations involved, positively affect the learning outcome in the alliance context (Inkpen and Dinur, 1998; Kale et al., 2000; Lane and Lubatkin, 1998; Makhija and Ganesh, 1997). Examples of such structural learning mechanisms include transfer groups, rotation of managers, mutual visits, and tours of each other's facilities. Similarly, Kale et al. (2000) showed that programmed interaction and communication between boundary spanners stimulate interorganizational learning. In short, formal learning behaviors capture the boundary encounters that occur by design, i.e., social interactions between boundary spanners deliberately planned and programmed by the alliance managers.

Although, "there are strong limitations in the structural solutions to the knowledge-sharing problem", particularly when highly tacit knowledge is concerned (Von Krogh, 2003, p. 376), the role of such structural solutions in interorganizational contexts seems pivotal as points of contacts for boundary spanners tend to be scarce. Structured interactions between partner boundary spanners in particular – in the form of joint project teams and task forces, visits and training programs, meetings and organized personal contacts, and transfers or lateral movements of managers – are well suited to achieving interorganizational flows of knowledge (cf. Makhija and Ganesh, 1997). In light of the above, we view formal learning behaviors as an important factor contributing to interorganizational learning outcome (cf. Thompson, 2005).

However, too many formal interactions can also hinder interorganizational learning. In a case study of a web-design agency set up by a global IT firm, the web-design branch was very successful initially, but as the parent firm attempted to leverage this success by introducing formal procedures and standards, it threatened to bring about its demise (Thompson, 2005). According to Wenger (1998, p. 233) increasingly "detailed prescriptions of practice carry (. . .) risks of being turned around", giving rise to meaningless behaviors. In the context of alliances, some programming of boundary spanner interactions may be needed to stimulate interorganizational learning, but too much of these will have a stifling effect. Too much pressure to participate in cross-organizational events can be perceived as detraction from everyday work activities, causing key knowledge-holders to delegate their boundary spanning responsibilities to others whose knowledge may be less rich or less relevant for the given collaboration and intended interorganizational learning. In the extreme case, boundary spanning activities can be delegated to individuals whose sole function is to represent the organization in collaborative relationship, i.e., 'professional boundary spanners'. The nature of such interactions is likely to be purely administrative and the learning outcome they produce minimal. If such delegation happens, close interactions may be taking place while the extent of interorganizational learning may be much more limited than otherwise would have been the case. Besides that, similarly to informal learning behaviors, an excess of programmed interactions between the boundary spanners can result in an inward communicative focus (Pak and Snell, 2003; Thompson, 2005). Hence:

**Hypothesis 2.** The effect of formal learning behaviors on interorganizational learning of tacit knowledge will take the form of an inverted-U relationship.

## 5. Mutual influences of informal and formal learning behaviors

We now take a closer look at the relationship between informal and formal learning behaviors. We expect formal learning behaviors to have a positive effect on informal learning behaviors. The latter require artifacts and structures that allow them to proceed; informal behaviors of individuals can thus be expected to be organized around the structured ones (cf. Wenger, 1998, p. 60). Also in an interorganizational setting, informal learning behaviors are likely to revolve around the formal social interactions orchestrated by the partners. The formal learning behaviors thus support and enable informal learning behaviors by the individuals. For example, programmed social interactions in the form of joint training sessions or joint projects are likely to stimulate individuals' intrinsic motivation to share knowledge and engage in informal social contacts, thus positively affecting informal learning behaviors.

We have argued that informal learning behaviors may be hindered by cultural misalignment among the boundary spanners of the two organizations (Fiol and Lyles, 1985; Lane and Beamish, 1990; Parkhe, 1993). Such real or perceived dissimilarity can be overcome through repeated interactions in the process of continuous exchanges between the two organizations (cf. Parkhe, 1998). In the collaboration between alliance partners, where informality is hindered by cultural misalignment such repeated interactions may be orchestrated, thus giving individual boundary spanners the opportunity to bridge the cultural misalignment (cf. Harvey and Griffith, 2002; Lewicki et al., 1998). Such intentionally designed and implemented interactions, giving boundary spanners of both partners the opportunity to get to know each other, decrease the extent of cultural

misalignment and thus also increase their intrinsic motivation to share knowledge, i.e., increase informal learning behaviors.

However, while some structured social interactions are clearly needed to bridge the cultural gap between the boundary spanners of the alliance partners, an excess of structure is likely to stifle informal learning. Too many forced interactions between partner boundary spanners (e.g., project teams and task forces, visits, meetings, training sessions, etc.) may make individuals less willing to spontaneously engage in these activities and decrease their intrinsic motivation to share knowledge. The excitement of the interaction diminishes to the degree that it is perceived as an obligation, rather than as a voluntarily seized opportunity. Additionally, excess of formal learning interactions can also decrease the informal learning behaviors, simply through a substitution effect. If too many interactions are scheduled or programmed, boundary spanners will simply see no need to initiate any additional, informal learning behaviors. Both fatigue as well as lesser need can thus decrease the motivation to initiate informal interactions. We expect therefore that above a certain optimum level, additional formal mechanisms are likely to induce diminishing or even negative increments of informal learning behaviors. Therefore, we hypothesize the following:

**Hypothesis 3.** The effect of formal learning behaviors on informal learning behaviors will take the form of an inverted-U relationship.

Note that the above effect is different from that proposed in Hypothesis 2. In the argumentation leading up to Hypothesis 2, an excess of formal interactions was argued to have a diminishing effect on interorganizational learning by way of its negative impact on the quality of contributions to interorganizational learning (in terms of depth and diversity of knowledge). Thus, while the interorganizational learning process becomes less productive in terms of the learning output, we assumed the level of motivation of boundary spanners to engage in learning behaviors to remain constant. Here, in contrast, we posit that the quality of inputs to the learning process remaining constant, an excess of structured interactions will negatively affect the willingness of boundary spanners to practice informal learning behaviors. In short, we expect the effect of formal learning behaviors on informal learning behaviors to diminish at higher levels, and to even turn negative at the margin.

The positive effect of informal learning behaviors on formal learning behaviors is perhaps less self-evident. Yet spontaneity can also be seen as producing structure: there is no meaningful structure without the spontaneous involvement of individuals (cf. Wenger, 1998). In fact, structure is often seen as emergent, based on the informal interaction that precedes it (e.g., Mutch, 2003). If the boundary spanners informally initiate contacts with each other, alliance managers are likely to facilitate such contacts by further orchestrating social interactions between them, be it in the form of joint training sessions or company visits. Further, in designing and implementing formal learning behaviors, alliance managers are likely to be guided by the already existing informal interactions, be it for the formation of project teams or establishment of formal contact channels. Pak and Snell (2003) found that changes in practice initiated by the operating-level employees may result in changed mental models and thus also change the management's policies. Informal learning behaviors by individual boundary spanners can therefore induce the strategic alliance's management to deliberately design and enforce social interactions between boundary spanners, if these are viewed as conducive to learning.

As with the effect of formal interactions on informal learning behaviors, we expect that the positive effect of informal on formal learning behaviors on structured ones will diminish and even become negative at higher levels of the informal behaviors. The emergence of orchestrated social interactions between boundary spanners may be a response to and be driven by informal learning behaviors, but it is unlikely that increasing informal learning behaviors will lead to more and more formal learning, given the costs of implementing structured interactions by the alliance managers. Thus partners are likely to invest in formal structures only to the extent that they see the need to support or reinforce the informal learning behaviors. If the informal learning behaviors flourish, there may be no clear need to further support the process by introducing more formalized interactions. Another reason for the diminishing effect of informal learning behaviors on formal learning behaviors may be the fact that informal social interactions between boundary spanners and the resulting interorganizational learning can be perceived as excessive by the partners, raising the risk of unwanted knowledge 'leakage'. In such a situation they may attempt to curb the informal learning behaviors, or at least refrain from encouraging them further, by limiting the structured social interactions between the boundary spanners. Increasing levels of informal learning behaviors can thus be expected to lead to positive but decreasing increments of formal learning behaviors. We thus hypothesize the following:

**Hypothesis 4.** The effect of informal learning behaviors on formal learning behaviors in strategic alliances will take the form of an inverted-U relationship.

## 6. Data and methods

The hypotheses developed in this paper have been tested on a sample of 149 joint ventures formed in Poland between a local and a foreign partner from a more developed economy.[2] Poland constitutes a particularly suitable empirical setting to investigate interorganizational learning in alliances, considering its recent accession to the European Union. In order to be competitive in the common market, Polish companies need to catch up with their European rivals in terms of new technologies and market-oriented management practices. For transition-economy organizations, foreign partners are rich reservoirs

[2] With the exception of four observations in our sample, all foreign partners originated from the developed Western European, North American and Asian economies. Only four of the foreign partners in our sample originated from other transition economies, i.e., Russia, Czech Republic and Belarus.

of new knowledge (Lyles and Salk, 1996) and collaboration with them an effective learning mechanism (Child and Markoczy, 1993; Markoczy, 1993). From the foreign firm's perspective, transition economies constitute an attractive new market which the local partner can help to navigate. The competence gap between the partners being on average quite vast, it is also in the interest of the foreign partner to assure the flow of knowledge to the local partner. Greater capability of a local partner contributes to a more efficient and fruitful collaboration.

The data was gathered by way of a survey, carried out in the fall of 2002 and spring of 2003. An address database of international JVs operating in Poland, including the name and function of a contact person (usually the CEO or another top manager), was acquired from a Polish commercial address provider, Teleadreson. A package containing a questionnaire, a cover letter, a supporting letter from the Dutch Embassy in Poland as well as a stamped return envelope was sent to 1218 JVs. 129 completed questionnaires were returned, 5 of which were found to be unusable.[3] The non-respondents were subsequently contacted by phone to inquire about the questionnaire. In 313 cases the firm was not a joint venture (anymore). Another 79 firms were not independent entities, did not exist anymore, had suspended their operations and/or were in liquidation. 166 replacement questionnaires were sent out to firms that confirmed their JV status and indicated willingness to respond. The second wave of mailing resulted in 26 additional responses (1 of them being unusable). The total response rate, therefore, reached the level of 18.6%, which although relatively low, we consider to be acceptable in view of the transition economy standards.[4] The sample included both JVs that involved the creation of a separate entity as well as those where the foreign partner took a minority share in an existing Polish company.

The questionnaire was directed at the Poland-based JV organization. It was developed based on an extensive literature review in the area of interorganizational learning in strategic alliances as well as on an exploratory pilot study which involved interviews with top managers of nine Polish-foreign JVs. Questions were formulated with the aim to gauge the learning outcome in the alliance context, informal learning behaviors of organizational boundary spanners, and the extent of formal learning mechanisms employed. In subsequent paragraphs we discuss the operationalization of the items in more detail. Due to the latent character of the key constructs, multi-item measures were used to increase their reliability and limit the measurement error (Churchill, 1979). This was specifically the case for the dependent variable of interorganizational learning outcome, for the independent variables of informal learning behaviors and formal learning behaviors, as well as for one of the control variables, i.e., cultural distance. For all composite variables the scores on the individual items were added and divided by the number of items. The questionnaire was proofread by four scholars both from the organization theory field and outside, with two of them having extensive experience with the survey method and two being native speakers of Polish. Before administering it, the questionnaire was pre-tested on sub-sample of four respondents, i.e., JV managers, in order to assure that all the questions were relevant and understandable and the response scales were appropriate.

*Operationalization of learning outcome*. It is debatable whether learning outcome, be it in the organizational or interorganizational context, is always reflected in organizational change. Two distinct approaches to the relationship between learning and organizational change have been identified in the literature. The first view postulates that learning constitutes an increase in the stock of knowledge that is activated only when needed (Nicolini and Meznar, 1995). From that perspective, organizational learning implies that the number of available behavioral options has increased (Nicolini and Meznar, 1995), but that, although learning might have taken place, a change in behavior will only be observed when circumstances activate the newly acquired knowledge. According to the second approach, every time learning takes place it will find reflection in improved actions and modified routines (Fiol and Lyles, 1985; Levitt and March, 1996), thus in behavioral change and improved effectiveness (Greve, 1998; Nicolini and Meznar, 1995; Weick, 1991). We believe that (inter)organizational learning can result in both types of changes. Therefore, for the purpose of this paper, we choose not to differentiate between the two approaches. Accordingly, our items for learning outcome capture some changes in behavior (items 2 and 3 of our scale) as well as some in the range of behavioral options (item 1 of our scale).

Importantly, however, when interorganizational learning takes place, some of the learning outcomes the partners will be consciously aware of, but some will remain unconscious. In our empirical investigation we tap into the organizational learning that it is socially constructed in the organizations under study (Nicolini and Meznar, 1995), i.e., learning outcomes that have been recognized as such by the members of these organizations. In other words, we assume that an organization has learned if it is recognized that potentially useful knowledge has been acquired (Huber, 1996). While the learning itself need not be conscious, the entity has to be aware of the differences and alternatives that the learning has produced (Nicolini and Meznar, 1995). This focus on "conscious learning" is in line with the survey research design of our study; it would not be possible to obtain information from the respondents about learning that they are not aware of. We would like to point out that capturing only learning that the respondents are aware of is a conservative measure of the amount of learning taking place in an alliance, which suggests that any effects we may find are likely to be even stronger in actual fact.

In line with the above, we operationalize learning outcome as the extent of conscious increase in the knowledge stock of the organization that occurred due to the collaboration with the alliance partner (i.e., an increase in the range of behavioral options), *as well as* the extent to which the collaboration with the partner led to improved pro-

[3] Due to the respondent's evident misinterpretation of the purpose of the project (as inferred from the respondent's comments), thus making the answers provided unreliable.

[4] Low response rates are due to: (1) a lack of tradition in collaborating with academia and (2) the large number of questionnaires received by most companies, resulting in a reluctance to participate.

cesses and/or performance of the organization (i.e., actual change in behavior). Consequently, items that we used to capture interorganizational learning referred to (1) the scope of learning (areas in which knowledge has been acquired multiplied by the extent of the acquisition), (2) increases in efficiency due to learning from the partner, and (3) application of the knowledge acquired from the partner in the JVs operations, outside of the collaborative context.

*Operationalization of informal learning behaviors*. Informal learning behaviors were captured with four items reflecting the nature of the theoretical construct, i.e., intrinsically motivated learning behaviors and informal, social contacts between boundary spanners of the alliance partners. Two items addressed the extent to which the foreign partner employees and those of the JV were motivated to engage in sharing knowledge with each other, while another two focused on the extent to which the boundary spanners of both organizations got along with each other and the extent to which their interactions/relationships extended beyond strictly professional interaction. These items align closely with the attributes of spontaneous organizational learning as found by Pak and Snell (2003, p. 281) in their exploratory study. They pointed out in particular that this type of learning is reflected in "employees interacting together spontaneously during or outside working hours" (compare with item 4 of our scale), "employees getting along well with each other" (compare with item 3 of our scale), and "interchange that [the employees] found intrinsically rewarding" (compare with items 1 and 2 of our scale).

*Operationalization of formal learning behaviors*. Formal learning behaviors were operationalized as the extent to which the partners employed such mechanisms as teams and task forces, meetings and organized personal contact, as well as transfer of managers, etc. (Makhija and Ganesh, 1997). The formal behaviors variable therefore encompassed six items referring to the frequency of (1) joint projects carried out by the partners (Makhija and Ganesh, 1997; Thompson, 2005), (2) events organized by the foreign partner in which the representatives of the Polish JV organization participate (Makhija and Ganesh, 1997), (3) visits by the foreign partner representatives to the Polish JV (Makhija and Ganesh, 1997; Thompson, 2005), (4) visits of the JV representatives to the foreign partner organization (Makhija and Ganesh, 1997; Thompson, 2005), (5) the frequency with which JV employees participate in training sessions organized by the foreign partner (Makhija and Ganesh, 1997; Thompson, 2005), and (6) the number of foreign partner employees who remain in the Polish JV organization on short-term assignments (Makhija and Ganesh, 1997). Such operationalization aligns with the empirical findings of Pak and Snell (2003) who found that the more programmed and formal types of learning generally consist of events such as official meetings and training sessions.

*Control variables*. In our analyses we controlled for a number of effects. First, we controlled for the cultural distance between the Polish and the foreign partner. In line with our earlier argument, social interactions between boundary spanners are more difficult when they are embedded in different organizational and national cultures. Therefore, cultural patterns of the transacting parties are likely to affect the effectiveness of cross-border interorganizational learning (Bhagat et al., 2002). This is in line with prior research that indicates that cultural misunderstandings negatively affect the flow of information and learning (Fiol and Lyles, 1985; Lane and Beamish, 1990; Lyles and Salk, 1996; Parkhe, 1993). Therefore, it is to be expected that interorganizational learning between partners with similar cultural patterns is much easier than between partners with dissimilar cultural backgrounds (Bhagat et al., 2002). We operationalized cultural distance as a perceptual measure, capturing aspects of both national and organizational culture.

Second, we controlled for two types of partner experience: prior collaborative experience of the two partners with each other as well as the Polish partner's prior collaborations with partners of the same national origin as the current foreign partner. Both types of experiences are likely to have a positive impact on partners' ability to communicate and learn effectively from each other. Prior collaboration with a given partner can be a source of relation-specific assets (Levinthal and Fichman, 1988) that allow for the development of partner-specific routines for effective communication and learning from each other (Kotabe et al., 2003) as well as trust between partners (Gulati, 1995). Prior experience in collaborating with partners of the same national background is likely to contribute to bridging cultural misalignment, thus limiting its negative effect on interorganizational learning. Third, we controlled for the age of the JV. The length of the ongoing collaboration can be expected to affect learning between partners in two ways. On the one hand, as the duration of collaboration increases, the novelty of the knowledge held by the partners is likely to decrease. In other words, the longer the partners collaborate, the more the scope for learning between them is likely to decrease. On the other hand, duration can also have a positive effect on learning, in that over time partners get to know each others' knowledge-bases and develop routines for collaboration and knowledge sharing (Kotabe et al., 2003).

Finally, the learning outcome in the alliance could also be affected by the governance structure of the collaboration. With respect to this we controlled for two effects: ownership structure and governance form. First, a partner holding a significantly greater share of the JV equity is likely to have significantly more power. This power imbalance may hamper the willingness of the weaker partner to share knowledge and to internalize knowledge originating from the more powerful party. In contrast, JVs where partners hold equal ownership shares have been shown to have a strong strategic rationale for sharing knowledge and display higher levels of knowledge acquisition (Lyles and Salk, 1996). On the other hand, such alliances are more likely to experience difficulties when cultural conflicts arise, since no one parent has dominant control (Killing, 1983). Instability resulting from such conflicts can be expected to have a negative effect on the interorganizational learning processes between the partners. Although the effect that partners' relative power to affect the operations of the JV can have on interorganizational learning is not read-

ily obvious, it was deemed necessary to control for this effect.

The second control variable relating to the governance structure of the alliance concerned whether the JV is a separate entity or a minority share alliance. There are two reasons why we controlled for the effect of governance form. First, separate entity JVs and minority share alliances can be argued to differ significantly with respect to the risks that knowledge sharing involves. Compared to separate entities, minority share alliances offer partners greater scope for monitoring the use of knowledge subsequent to its transfer. Second, the choice of governance form might not be voluntary on the part of the alliance partners. Polish regulations impose restrictions on foreign ownership in certain branches of industry. Additionally, in the event of companies undergoing privatization, an external investor is often allowed to hold only a minority share in the previously fully state-owned enterprise (Janowicz et al., 2004). This consideration obviously affects the choice between full ownership and minority share governance and not between a separate entity JV and a minority share governance. Nevertheless, it does suggest that minority share alliances might be different from the separate entity JVs in terms of motivations underlying their formation (if a minority share alliance is in fact a default option, where full ownership is not allowed).

Before proceeding with our analyses, we ascertained the discriminant and convergent validity of the composite variables. With the exception of one, all items used in the composite variables were measured on a 7-point Likert-type scale. The one exception was item 1, which was a product of a count measure ranging from 0 to 9 and a 7-point item. For details see Appendix 1. Although no strict levels of skewness and kurtosis pointing to deviation from normality exist, skewness in the range 2.00–3.00 and kurtosis in the range from 7.00 to 21.00, are considered to be an indication of moderate non-normality. Skewness and kurtosis of above 3.00 and 21.00, respectively, are an indication of extreme non-normality (Byrne, 1998). Considering these criteria and the fact that the average skewness and kurtosis for the items are 0.24 and 0.13, respectively, we consider the scores below as approximating normality. Table 1 presents the descriptive statistics for the items.

**Table 2**
Confirmatory factor analysis (CFA) and reliability results

| Item | $\alpha$ | Standardized item loading | $t$-Value |
|---|---|---|---|
| Interorganizational learning | 0.80 | | |
| Knowledge acquisition | | 0.74 | 9.17 |
| Knowledge application | | 0.60 | 6.84 |
| Efficiency improvement | | 0.78 | 9.78 |
| Informal learning behaviors | 0.76 | | |
| Foreign partner motivation to share | | 0.94 | 14.04 |
| JV motivation to share | | 0.81 | 11.28 |
| Get along | | 0.46 | 5.69 |
| Social contacts | | 0.38 | 4.54 |
| Formal learning behaviors | 0.86 | | |
| Joint project frequency | | 0.70 | 9.27 |
| Event frequency | | 0.78 | 10.77 |
| HQ training frequency | | 0.78 | 10.78 |
| Foreign partner visits | | 0.71 | 9.47 |
| Polish partner visits | | 0.80 | 10.07 |
| Short termers | | 0.57 | 7.15 |
| Cultural distance | 0.64 | | |
| Difference in mentality | | 0.70 | 6.68 |
| Difference in buss practices | | 0.60 | 6.03 |
| Difference in organizational culture | | 0.54 | 5.50 |

To evaluate the reliability of the measures we used confirmatory factor analysis (CFA) and Cronbach's alpha (see Table 2). The CFA was carried out with the maximum likelihood estimation in LISREL 8.7 (Jöreskog and Sörbom, 1993). Each item was restricted to load on its specified construct, with the four constructs being allowed to correlate freely. The chi-squared for this model was significant: chi-squared = 137.51; d.f. = 95; $p$-value = 0.0029. The fit indices: the Absolute Fit Indices GFI (0.90) and AGFI (0.85) as well as the Comparative Fit Index (CFI = 0.98) and the Incremental Fit Index (IFI = 0.98) were all of relatively high level. Additionally, the Root Mean Square Error of Approximation (RMSEA) was assessed as it incorporates a penalty for lack of parsimony. It took on a value of 0.055. All of the above indicators point to a good fit of the model with the sample observations. Cronbach's alpha for interorganizational learning outcome (three items) equaled 0.80, for informal learning behaviors 0.76, for formal learning behaviors 0.86, and 0.64 for the perceived cultural distance. Thus for all the

**Table 1**
Descriptive statistics for composite variable items

| No. | Item | Mean | S.D. | Minimum | Maximum | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| 1. | Knowledge acquisition | 17.47 | 14.73 | 0 | 63 | 1.04 | 0.43 |
| 2. | Knowledge application | 4.30 | 2.04 | 1 | 7 | −0.21 | −1.25 |
| 3. | Efficiency improvement | 4.18 | 1.91 | 1 | 7 | −0.15 | −1.16 |
| 4. | Foreign partner motivation to share | 3.56 | 2.04 | 1 | 7 | 0.31 | −1.18 |
| 5. | JV motivation to share | 3.65 | 1.99 | 1 | 7 | 0.28 | −1.09 |
| 6. | Get along | 5.14 | 1.76 | 1 | 7 | −0.88 | −0.06 |
| 7. | Social contacts | 3.44 | 2.14 | 1 | 7 | 0.27 | −1.33 |
| 8. | Joint project frequency | 2.72 | 1.62 | 1 | 7 | 0.81 | 0.27 |
| 9. | Event frequency | 2.49 | 1.30 | 1 | 7 | 1.72 | 3.74 |
| 10. | HQ training frequency | 1.84 | 1.25 | 1 | 7 | 2.24 | 5.79 |
| 11. | Foreign partner visits | 3.36 | 1.65 | 1 | 7 | 1.04 | 0.10 |
| 12. | Polish partner visits | 2.74 | 1.51 | 1 | 7 | 1.34 | 1.53 |
| 13. | Short termers | 2.22 | 1.26 | 1 | 7 | 1.41 | 2.89 |
| 14. | Difference in mentality | 4.33 | 1.75 | 1 | 7 | −0.32 | −0.87 |
| 15. | Difference in buss practices | 3.93 | 1.65 | 1 | 7 | 0.10 | −0.75 |
| 16. | Difference in organizational culture | 4.40 | 1.72 | 1 | 7 | −0.24 | −0.89 |

**Table 3**
Inter-construct correlations

| | Interorganizational learning | Individual learning behaviors | Structural mechanisms | Cultural distance |
|---|---|---|---|---|
| Interorganizational learning | 1.00 | | | |
| Informal learning behavior | 0.58 | 1.00 | | |
| Formal learning behaviors | 0.53 | 0.58 | 1.00 | |
| Cultural distance | −0.17 | −0.15 | −0.10 | 1.00 |

variables the above condition was satisfied and reliability of the measures assured.

Convergent validity of the constructs is established when the confirmatory factor analysis model fits the data and the factor loadings are significant (Abe et al., 1996). The first condition was discussed above and fully supports the claim of convergent validity. All constructs demonstrated large and significant standardized loadings and the average loading size equaled 0.68. All of this points to a desirable level of convergent reliability.

A test for the presence of discriminant validity between constructs involves a comparison of a model in which the constructs are allowed to correlate freely with a model in which the correlations between them are fixed to be 1; the larger the difference in the chi-square of the two models as well as in the GFI and CFI values they yield, the stronger the evidence of discriminant validity (Byrne, 1998). The difference in chi-squared between the two models equaled 162.02 (d.f. = 6) and was highly significant. The difference in GFI between the two models equaled 0.10 and 0.07 in CFI. This provides evidence of discriminant validity between the constructs. Discriminant validity can also be inferred from the correlation estimates between any two constructs (Jöreskog and Sörbom, 1993). As evidenced in Table 3, no correlation took on a value of 1 (Anderson and Gerbing, 1988). The highest correlation was 0.58 between interorganizational learning outcome and informal learning behavior. This high value is to be expected, however, as it captures the relationship between closely related yet distinct concepts.

The discriminant validity of pairs of constructs with highest correlations (i.e., 0.5 and above) was additionally assessed using the strict Fornell and Larcker test (1981). This was accomplished for each set of constructs by comparing two nested confirmatory factor analytical models; one where the constructs were allowed to correlate freely with another where they were perfectly correlated.[5] As was the case for the general discriminant validity, the larger the difference in Chi-squared and practical fit measures (i.e., CFI/GFI) between the models, the stronger the support for evidence of discriminant validity of the traits (Byrne, 1998). Table 4 presents the results of this investigation. In all six cases the difference in chi-squared between the two models turned out to be strongly significant ($p < 0.001$). Also, in all three cases the difference in the practical model fit was quite substantial. Therefore, there is sufficient evidence for discriminant validity of the constructs.

Besides the composite variables described and established above, we employed a number of single item variables. Four of the control variables were captured with a dummy variable. JV governance structure took on the value of 1 if the JV was a separate entity and 0 if it was a minority share alliance. The ownership structure variable took on the value of 1 if the joint venture's ownership was equally shared by both partners (in the range of 40–59%). Prior ties variable took on a value of 1 if the partners had collaborated in any form in the past and 0 if they had not. Similarly, prior country cooperation took on the value of 1 if the Polish partner had collaborated with a partner of the same national origin as the current foreign partner in the past, and 0 if this was not the case. Finally, JV duration was captured with the number of years that had passed since the alliance formation.

We tested for the possible non-response bias by evaluating the differences in the means of the 21 variables (16 construct items and 5 single-item variables: governance form, ownership form, prior ties, prior country experience, JV age) between the early and the late respondents (Armstrong and Overton, 1977). The early respondents made up the first 60% batch of returned questionnaires, while the late respondents made up the remaining 40% of responses. Such categorization approximately reflected the actual inflow of the questionnaires (cf. Lages and Lages, 2004). With the exception of one control variable, no significant differences between the early and late respondents were found. The two groups differed significantly in terms of the Polish partner's experience in collaborating with firms of the same national origin as the current foreign partner, the average equaling 0.18 and 0.36, respectively (for a dummy variable). We do not see this as strong evidence of non-response bias, nor do we perceive this to pose a serious threat to the reliability of our results.

The instrument (i.e., questionnaire) used in this study could have created a common method variance, as the majority of our measures were perceptual in character.

**Table 4**
Discriminant validity of pairs of traits

| | Chi-squared | d.f. | CFI | GFI |
|---|---|---|---|---|
| Interorganizational learning vs. informal learning behaviors | | | | |
| Free | 49.19 | 13 | 0.94 | 0.92 |
| Constrained | 124.98 | 14 | 0.80 | 0.81 |
| Δ | **79.75** | **1** | **0.14** | **0.11** |
| Interorganizational learning vs. formal learning behaviors | | | | |
| Free | 65.43 | 26 | 0.96 | 0.91 |
| Constrained | 166.76 | 27 | 0.87 | 0.81 |
| Δ | **101.33** | **1** | **0.09** | **0.10** |
| Informal vs. formal learning behaviors | | | | |
| Free | 97.30 | 34 | 0.95 | 0.89 |
| Constrained | 177.70 | 35 | 0.89 | 0.81 |
| Δ | **80.40** | **1** | **0.06** | **0.08** |

[5] LISREL 8.7 statistical package was used.

**Table 5**
Descriptive statistics and correlations

| | Mean | S.D. | *N* | 1 | 3 | 2 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Interorganizational learning | 0.01 | 0.85 | 147 | 1.00 | | | | | | | | |
| 3. Informal learning behaviors | 3.97 | 1.52 | 146 | 0.55** | 1.00 | | | | | | | |
| 2. Formal learning behaviors | −0.02 | 1.10 | 146 | 0.49** | 0.58** | 1.00 | | | | | | |
| 4. Cultural distance | 4.22 | 1.31 | 148 | −0.23** | −0.15 | −0.10 | 1.00 | | | | | |
| 5. JV age | 9.26 | 2.86 | 149 | −0.10 | −0.13 | −0.11 | −0.01 | 1.00 | | | | |
| 6. Separate entity | 0.81 | 0.40 | 149 | −0.13 | −0.05 | −0.16* | −0.05 | 0.16 | 1.00 | | | |
| 7. Shared ownership | 0.36 | 0.48 | 149 | −0.06 | −0.08 | −0.08 | −0.11 | 0.02 | 0.05 | 1.00 | | |
| 8. Prior partner cooperation | 0.39 | 0.49 | 149 | 0.12 | 0.09 | −0.03 | 0.00 | −0.09 | 0.18* | −0.03 | 1.00 | |
| 9. Prior country cooperation | 0.29 | 0.46 | 149 | −0.01 | 0.08 | 0.02 | 0.15 | −0.05 | 0.05 | −0.08 | 0.40** | 1.00 |

*$p \leq 0.05$; **$p \leq 0.01$.

Whenever perceptual measures rather than objective items are used, the results may be affected by the respondents' subjective perceptions. This would have been particularly likely had the respondents known the theoretical framework used in designing the tool (Lages and Lages, 2004). This was, however, not the case. Additionally the items were not presented to the respondents in any way that would suggest the purpose of the study. To further check for a possible common method bias, we performed a principal component analysis on the perceptual items (all construct items) in our model. Four factors with eigenvalues above 1 were identified, with the largest factor accounting for 37.41% of the total variance. Based on the above, we conclude that the presence of common method bias is unlikely in our data. All hypotheses were tested by means of multiple regression.[6] Table 5 presents descriptive statistics for the variables used in the models.

Some missing values were encountered. They were dealt with by applying list-wise deletion. However, to make the fullest possible use of the scarce data, this was done on a model-by-model basis, hence the differences in sample size across the models. The highest correlations can be observed between interorganizational learning outcome and informal learning behaviors (0.55) and between formal learning behaviors and informal learning behaviors (0.58). Yet, since the discriminant validity of the two constructs has been established and no evidence of multicollinearity in our models exists, we confidently proceed with model estimation. We checked for the possible presence of multicollinearity by calculating variance inflation factors (VIFs). There is evidence of multicollinearity if the largest VIF is larger than 10, and the mean of all VIFs is considerably larger than 1 (StataCorp, 2001). As reflected in Table 6, no such evidence was to be found in our models. Additionally, all the models were tested for the presence of heteroskedasticity. No evidence of either of the problems was found in the models where learning outcome and informal learning behaviors were the dependent variable. In case of the models where formal learning behaviors was the dependent variable, there was evidence of heteroskedasticity, thus the models were re-estimated (and reported in Table 6) with the White-corrected standard errors.[7]

## 7. Results

Table 6 presents the results of the multiple regression analysis. Models 1–5 have the interorganizational learning outcome as the dependent variable, while Models 6–8 and 9–11 have informal and formal learning behaviors, respectively, as the dependent variables. The first model in each set (Models 1, 6 and 9) investigates the effect of control variables on the dependent variable. The second model in each set includes the simple terms of the focal variables, while the third model in each set (regarding learning outcome also the fourth and fifth) looks at the hypothesized squared effects. All models are significant, and the inclusion of the main effects of the focal explanatory variables in all cases results in a marked and significant increase in the $R^2$ (from 0.10 to 0.39, from 0.06 to 0.36, and from 0.06 to 0.37 in the three consecutive sets of models, respectively). This gives us confidence that the independent variables capture a significant portion of the variance in the dependent variables. The inclusion of the quadratic effects further contributes to the explanatory power of our models. There are two exceptions, however: in both cases, if the squared effect of informal learning behavior is added to the models (i.e., Models 4 and 11) the increase in $R^2$ is not significant, which falls in line with the insignificant effects of those quadratic coefficients.

Model 2 provides evidence for the effects of informal and formal learning behaviors on interorganizational learning. We find that both variables have a positive and highly significant effect on the dependent variable. As for the quadratic effects, the squared effect of informal learning behaviors is insignificant (Models 3 and 5), while formal learning behaviors variable shows a negative and significant effect (Models 4 and 5). These results yield support for Hypothesis 2, reflecting a positive but diminishing effect of formal learning behaviors on interorganizational learning, but lead to the rejection of hypothesis 1, revealing not an inverted-U relationship, but a consistently positive effect of informal learning behaviors on interorganizational

[6] Given the latent character of a number of variables, the use of structural equation modeling would have been preferable; however, the insufficient sample size made a reliable application of this method impossible.

[7] The "robust" function in STATA was used, which replaces the conventional calculation with a robust variance matrix calculation (StataCorp, 2001).

**Table 6**
The effect of formal and informal learning behaviors on interorganizational learning outcome, informal learning behaviors and formal behaviors: multiple moderated regression

| | Interorganizational learning | | | | | Informal learning behaviors | | | Formal learning behaviors | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 | Model 9 | Model 10 | Model 11 |
| Separate entity | −0.36* | −0.25 | −0.25 | −0.23 | −0.22 | −0.18 | 0.18 | 0.23 | −0.44 | −0.37† | −0.37† |
| Shared ownership | −0.13 | 0.01 | 0.01 | −0.00 | −0.00 | −0.26 | −0.08 | −0.12 | −0.19 | −0.09 | −0.09 |
| JV age | −0.01 | 0.01 | 0.01 | 0.01 | 0.01 | −0.06 | −0.02 | −0.01 | −0.04 | −0.02 | −0.02 |
| Prior ties | −0.28† | 0.23† | 0.23† | 0.24† | 0.23 | 0.18 | 0.23 | 0.23 | −0.06 | −0.12 | −0.13 |
| Prior country exp | −0.08 | −0.11 | −0.11 | −0.13 | −0.12 | 0.24 | 0.15 | 0.09 | 0.12 | 0.02 | 0.02 |
| Cultural distance | −0.15** | −0.08† | −0.08† | −0.09† | −0.08 | −0.20* | −0.10 | −0.12 | −0.11 | −0.04 | −0.03 |
| Informal learning behaviors | | 0.21** | 0.21** | 0.17** | 0.17** | | | | | 0.42** | 0.42** |
| Informal learning behaviors$^2$ | | | −0.01 | | 0.01 | | | | | | 0.01 |
| Formal learning behaviors | | 0.20** | 0.20** | 0.34** | 0.35** | | 0.79** | 1.12** | | | |
| Formal learning behaviors$^2$ | | | | −0.07* | −0.07* | | | −0.19** | | | |
| Constant | (+)** | n.s. | n.s. | n.s. | n.s. | (+)** | (+)** | (+)** | (+)* | (−)* | (+) |
| $N$ | 146 | 141 | 141 | 141 | 141 | 146 | 143 | 143 | 145 | 143 | 143 |
| $F$ | 2.64 (6,139) | 10.55 (8,132) | 9.32 (9,131) | 10.23 (9,131) | 9.15 (10,130) | 1.44 (6,139) | 10.90 (7,135) | 12.36 (8,134) | 1.70 (6,138) | 10.01 (7,135) | 11.81 (8,134) |
| $p > F$ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 |
| $R^2$ | 0.10 | 0.39 | 0.39 | 0.41 | 0.41 | 0.06 | 0.36 | 0.43 | 0.06 | 0.37 | 0.37 |
| Max VIF | 1.24 | 1.58 | 1.58 | 3.14 | 3.24 | 1.24 | 1.23 | 1.98 | 1.23 | 1.23 | 1.26 |
| Average VIF | 1.11 | 1.23 | 1.22 | 1.53 | 1.52 | 1.11 | 1.11 | 1.32 | 1.10 | 1.10 | 1.10 |
| Hettest | n.s. | n.s. | n.s. | n.s | n.s. | n.s. | n.s | n.s. | Robust | Robust | Robust |

† $p \leq 0.1$; * $p \leq 0.05$; ** $p \leq 0.01$.

learning. Fig. 1 presents the effect of informal and formal learning behaviors on interorganizational learning. It reveals that in our sample, the marginal benefit of an additional unit of formal learning behaviors for interorganizational learning decreases as the level of formal behavior increases and that at one point, in fact, the overall learning outcome will start to decrease as a result of an additional unit of formal behavior. In contrast, the positive effect of informal learning behaviors on interorganizational learning outcome remains unabated.

Hypotheses 3 and 4 predicted that formal learning behaviors would have a positive but diminishing effect on informal learning behaviors and, vice versa, that informal learning behaviors would have a positive but diminishing effect on formal behaviors. We find support for the former but none for the latter prediction. Model 8 reveals a significant and negative quadratic effect of formal learning behaviors on informal learning behaviors, which, in combination with a significant and positive simple term, points to an inverted-U relationship (see Fig. 2). Model 11 in turn reveals a consistently positive effect of informal learning behaviors on formal behaviors (see Fig. 2).

As for the control variables, cultural distance between the partners has a negative and marginally significant (at 10% level) effect on the interorganizational learning outcome. This is an intuitive finding. No such effect is present in models with informal and formal learning behaviors as dependent variables (besides Model 9 with control variables only). The two types of prior experience, i.e., prior collaborative experience between the two partners and the Polish partner's prior collaborations with partners of the same national origin as the current foreign partner, have no effect on either informal or formal learning behaviors. However, prior ties of the two partners do have a positive and significant (at 10% level) effect on interorganizational learning. Prior collaborations with a partner of the same national origin appear to have no effect on the learning outcome. As for the JV duration, it remains consistently insignificant across all models. Finally, the two control variables related to governance structure yield interesting results. The ownership structure of the joint venture, whether it was a 50/50 split or not, has no effect across all models. As for the governance form, as reflected in the joint venture being a separate entity (as opposed to a minority share alliance), we find that it has a negative and significant (at 10% level) effect on formal learning behaviors in the alliance. This implies that the extent to which formal learning behaviors take place in separate entity joint ventures is significantly lower than in minority share alliances. As far as interorganizational learning is concerned, the governance structure takes on a consistently negative effect, although it reaches significance only in two models. The direction of the effect is intuitive, as the flow of knowledge may be expected to be more difficult if the JV is a separate entity, than if the foreign partner takes an ownership stake in an existing enterprise.

## 8. Discussion and implications

In this paper we drew on social learning theory to generate new insights into the process of interorganizational

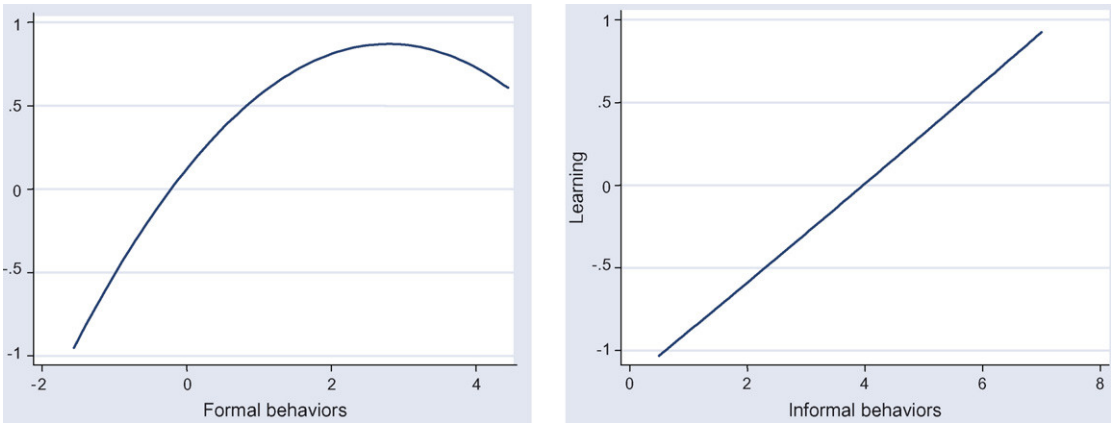


**Fig. 1.** The effect of formal and informal learning behaviors on interorganizational learning.

learning in the context of strategic alliances. We built on the premise that since all knowledge has a tacit component, social interactions between boundary spanners of collaborating organizations are necessary for knowledge to flow between the partners. Such social interactions may emerge informally between boundary spanners—informal learning behaviors – or be orchestrated and programmed by the alliance management – formal learning behaviors. We hypothesized and found support for the positive effect of both informal and formal learning behaviors on the learning outcome in alliances. However, we did not expect the effect of informal and formal learning behaviors to be consistently positive; rather we predicted that they would have a diminishing positive effect on the learning outcome. We found that while this is indeed so for formal learning behaviors, this does not hold for informal behaviors. While the positive effect of formal behaviors diminishes as its level in the collaboration increases, the positive effect of informal learning behaviors remains unabated.

Our results thus reveal that *both* the informal social interactions as well as those orchestrated by the alliance management positively affect interorganizational learning outcome. This finding confirms the suggestion of Contu and Willmott (2003) that in considering (inter)organizational learning, it is necessary to account for the voluntary, informal behaviors *as well as* proceduralization. Our study further sheds light on the question posed by Contu and Willmott (2003) with respect to the extent to which each of the two types of behaviors contribute to (inter)organizational learning. We find that both have a positive effect on learning outcome. Therefore, as implied by the structuration theory of Giddens (1984), we find that in interorganizational learning the two factors have a complementary role to play. This points to the need of studying the effect of various learning catalysts jointly, rather than in isolation.

Our findings also reveal that the positive effect of formal learning behaviors diminishes at higher levels. Similarly to Thompson (2005) we find that an excess of formalization can threaten learning. Our findings also align with those of Pak and Snell (2003), supporting their conclusion that different forms of organizational learning behaviors exist and contribute to the overall learning outcome. These findings also support Wenger's (1998) assertion that overly detailed prescriptions of practice can lead to meaning-

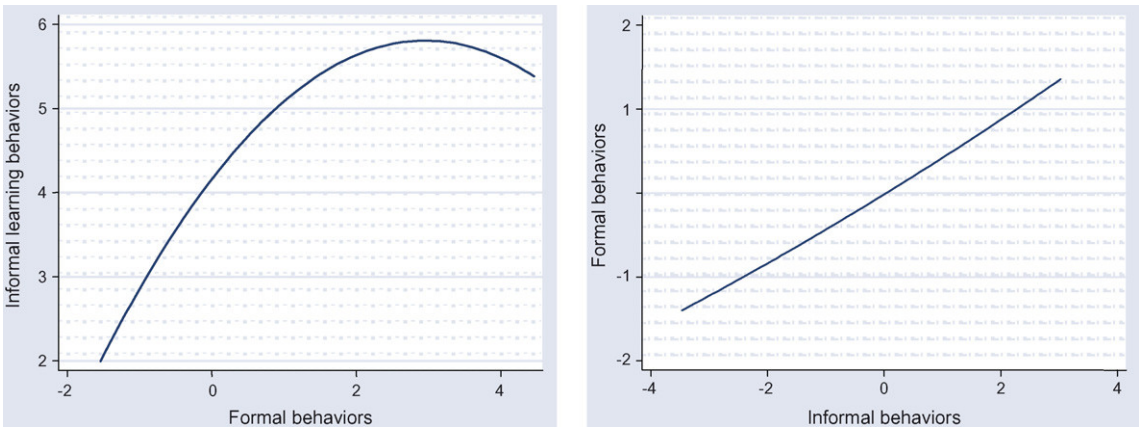


**Fig. 2.** The effect of formal on informal learning behaviors, and of informal on formal learning behaviors.

less behaviors, and thus to less learning. In the context of our study, an excessive degree of orchestrated social interactions clearly results in decreasing and even negative increments in learning outcome.

The above findings have interesting practical implications as they shed light on the effectiveness of informal learning behaviors of boundary spanners and of formalized interactions between boundary spanners orchestrated by the alliance managers to facilitate interorganizational learning. They reveal that both informality and formalization can drive interorganizational learning. Alliance partners wishing to stimulate interorganizational learning above and beyond what the informal initiatives of their boundary spanners achieve have a host of formal mechanisms from which to choose. Formal mechanisms including joint projects, joint events, reciprocal visits or the stationing of expatriates can be used to stimulate not only the interorganizational learning itself but also to encourage informal learning behaviors of the boundary spanners. However, there are limits to what formalization can achieve in terms of inducing learning and informality. In line with our predictions, excessive structure may stifle interorganizational knowledge flows and informal learning behaviors. Also, in aiming to achieve interorganizational learning, alliance partners should be aware that there are decreasing marginal benefits to be gained from applying additional units of formal mechanisms. Considering that building such mechanisms is not without costs (cf. Parkhe, 1993) it is evident that the benefits they yield need to be weighed against the costs of their "production".

Informality on the other hand has a consistently positive effect on interorganizational learning of tacit knowledge. Therefore, where informal learning behaviors abound while more tacit knowledge flow between organizations is *un*desirable, the partners may need to curb informal interactions. This can be achieved by introducing formal mechanisms that block opportunities for knowledge sharing. Future research should investigate the effectiveness of such mechanisms on limiting interorganizational learning. Based on our results, we can conclude that an excessive use of structural mechanisms intended to stimulate learning can effectively hinder interorganizational learning and, perhaps even more importantly, can make boundary spanners loose their intrinsic motivation to engage in informal learning behaviors. In short, our findings indicate that while an excess of formal mechanisms can be detrimental to learning in the alliance and informal learning behaviors, there is no such threat with informal learning behaviors.

We further investigated the mutual effect of formal and informal learning behaviors. We found a mutually reinforcing relationship between the two. Similarly to the learning outcome, we predicted that the effect of informal learning behaviors on formal behaviors and vice versa would be positive and diminishing. Our results reveal that while this is indeed the case of formal learning behaviors, informal learning behaviors appear to have a consistently positive effect on formal ones. Interestingly, thus, the relationship between formalization and both interorganizational learning and informal learning behaviors takes on an inverted-U shape. In contrast, the effect of informal learning behaviors both on learning outcome and formal behaviors remains consistently positive.

The fact that the latter finding only partially aligns with our hypotheses can be due to a number of factors. First, being members of different organizations, boundary spanners may be less prone to developing the inward communicative focus that negatively affects learning, as observed by Thompson (2005) and Pak and Snell (2003). This is because individuals from different organizations, bringing with them their unique cultural backgrounds and organizational loyalties, are less likely to develop the level of identification with the group that would put them at risk of "losing touch" with their environment. Similarly, the interorganizational context of our study may be the underlying reason for the finding that the effect of informal learning behaviors on the emergence of formal behaviors does not diminish, in contrast to what we expected. Where interacting individuals have different organizational origins, the increasing informal learning behaviors will also result in consistently increasing (rather than diminishing) formal learning interactions. This is because, in comparison to intra-organizational contexts, the need to stimulate and support the informal interactions will be greater and the increase in formal mechanisms will not diminish despite the costs involved.

Second, it may be that in alliances where the opportunities for informal learning behaviors are relatively limited, the extent of those behaviors does not reach levels high enough to be detrimental to the learning outcome. For that same reason, alliance managers may not perceive the threat of knowledge leakage which, as we argued, could lead them to limit the use of formal mechanisms, resulting in an inverted-U relationship between informal and formal learning interactions. Third, and related to the above, the consistently positive effect of informal learning behaviors on both learning outcome and formal interactions may be caused by the fact that our sample encompasses only JVs that involve partners geographically distant from each other. JVs involving partners from the same country, where the potential for informal interactions is significantly greater, are thus not part of our analysis. Our results may thus be (partially) caused by the sample selection bias inherent in our data.

Leaving empirical considerations to the side, these findings have important theoretical implications. In line with Wenger's assertion, they first of all reveal that, also in interorganizational contexts, informal social interactions are organized and revolve around formal structure (cf. Wenger, 1998). Formalized interactions enable and support informal interactions between boundary spanners. However, this positive effect is not without limits, as it may even bring about negative increments of informal learning behaviors if the excess of formalization is overly pronounced. This therefore supports our argument that excessive formalization may have a negative effect on boundary spanners' informal learning efforts, which has important managerial implications. While organized contacts between boundary spanners such as joint projects and reciprocal visits stimulate their informal learning behaviors, too many of such imposed interactions will have the opposite effect.

As far as the effect of informal learning behaviors on formalized interactions is concerned, our findings also support the literature assertions (cf. Mutch, 2003; Wenger, 1998) that structure is emergent and based on the informal involvement of individuals. Interestingly, though perhaps not surprisingly, the magnitude of this effect is half of that exerted by formal behaviors on informal learning behaviors. As the findings of Pak and Snell (2003) suggest, the effect of informally initiated practices on changed structures requires that the mental models of the apex are modified. This is likely to be neither an easy nor a fast process. The fact that a change of mental models is required for informal behavior to have impact on the formal structure may also explain why our assertion of the diminishing positive effect did not hold. Once a certain informally initiated practice finds its way into the mental models of the management level, considerations of cost or excess in this practice (as we argued) are no longer of much relevance.

Since both informal and formal learning behaviors have a positive effect on interorganizational learning, they can be considered complementary. This conclusion is supported by the fact that the two learning mechanisms mutually reinforce each other. However, despite this mutually reinforcing relationship, the two cannot be considered to be perfect complements, since the positive effect of formalization fades away as its level increases. Therefore, while increasing levels of informal learning behaviors have a consistently positive effect on formal behaviors, additional formalization will positively affect informal learning mechanisms only up to a point, beyond which the positive effect will start diminishing.

Finally, the control variables provide some interesting findings. First, the perceived cultural distance has a negative effect on the extent of learning between alliance partners (significant at 10% significance level). This is an intuitive finding. Prior research has shown that cultural distance and the conflict it engenders hamper the flow of knowledge between partners (Fiol and Lyles, 1985; Lane and Beamish, 1990; Parkhe, 1993). At the same time, however, the fact that a given Polish firm has collaborated with another foreign partner of the same national background appears to have no effect on the interorganizational learning outcome. This is surprising, since experience with a partner from the same national background could be expected to help bridge the cultural distance experienced by the partners and thus alleviate its negative effect on the interorganizational learning outcome. To further investigate this possibility we re-estimated Model 2 with the interaction of cultural distance and experience with a partner from the same national background. The interaction term, while positive, was not significant. At the same time, prior country experience remained insignificant while the negative effect of cultural distance increased in significance. The idea that prior experience with another partner of the same national background will alleviate the negative effect of cultural distance on interorganizational learning is therefore not supported.

Second, the prior ties control variable captured the effect of previous collaborative experience between the two focal partners. In its effect on interorganizational learning outcome, it took on a consistently positive and significant value. This is to be expected as, through repeated interactions, partners can be expected to build up trust (Gulati, 1995) and develop routines for the efficient communication and acquisition of hard-to-transfer knowledge from the partner (cf. Kotabe et al., 2003). However, the same arguments also hold for the experience that partners accumulate in the course of their ongoing collaboration. The longer the collaboration continues, the greater the efficiency of learning and thus the greater the learning outcome can be expected to be (Kotabe et al., 2003). However, we did not find a positive effect of JV duration on learning. In fact, the effect of JV age remains consistently insignificant in all the models and virtually equal to zero. This counterintuitive finding can plausibly be attributed to the JV age being a poor proxy for the build-up of trust and learning routines in a collaboration, as it is likely to conflate with other effects. In specific, it is likely that the two opposing effects that JV age can capture, namely decreasing novelty of the knowledge and increasing familiarity with the partner's knowledge and ways to tap into it, cancel each other out (cf. Nooteboom, 2004).

Our research sets the stage for a number of interesting and potentially fruitful areas for future investigation. First, future research could investigate whether the curvilinear relationship between formalized interactions and interorganizational learning holds for different kinds of formal mechanisms and different types of knowledge (cf. Cardinal, 2001; Turner and Makhija, 2006). Also, the consistently positive effect of informal learning behaviors on the learning outcome should be verified on a sample of local JVs to eliminate the possibility of our finding being a result of the international nature of our data. Additionally, the question of causality between formal and informal learning behaviors on the one hand and interorganizational learning on the other calls for further investigation. It is possible that greater interorganizational learning leads to increased levels of both informal learning behaviors, as it builds the quality of relationship between the boundary spanners, and of formal behaviors, the forms of which are likely to be affected by the interorganizational learning that has taken place so far. The cross-sectional design of our study makes it impossible for us to investigate the causality issue. This also constitutes one of the primary limitations of our study. Future research should endeavor to test the hypothesized relationships in a longitudinal research design.

This study is marked by a number of additional limitations. First, from the theoretical point of view, learning in an alliance incorporates both the acquisition *and* internalization of knowledge by each of the partners (Kale et al., 2000). Newly acquired knowledge can further organization's goals only inasmuch as it is disseminated and integrated within the organization (Jelinek, 1979). In this paper we focused only on the interorganizational determinants of the learning in alliances, while a host of *intra-organizational* effects are also likely to be at play, particularly in terms of the internal dissemination and integration of the knowledge acquired from the foreign partner. While our dependent variable

captures knowledge acquisition *and* internalization, our explanatory variables encompass only the *interorganizational* determinants of learning between partners. The intra-organizational effects, relevant for knowledge internalization, are left out of the analysis. Second, in obtaining our data, we were able to sample one side of the collaborating dyads only. This is an obvious limitation of the study, especially since it focuses on such elusive aspects of collaboration as learning or informal learning behaviors of boundary spanners. Comparing perceptions of the Polish partner to those of the foreign partner organization would have enriched the data and strengthened the findings. Finally, the low response rate to our survey is clearly another limitation. Even though an 18.6% level is acceptable considering the transition economy standards, and the comparison of early and late respondents did not reveal any significant differences between them, the low response rate may have affected our results.

## Appendix A. Questionnaire items

| **INTERORGANIZATIONAL LEARNING OUTCOME** | **Cronbach's $\alpha = 0.80$** |
|---|---|
| 1. Knowledge Acquisition | |
| a) Have you in the course of collaboration, acquired knowledge from the foreign partner in the area of:<br>• production / service technology<br>• firm management<br>• information and computer technology<br>• human resource management<br>• customer service<br>• business negotiations<br>• market knowledge<br>• marketing<br>• financial and tax management | Yes/No |
| b) On average how much did you learn from the foreign partner in the above areas? | 1: nothing – 7: a lot |
| 2. Knowledge Application | |
| What we have learned from the foreign partner we use in projects developed independently by the JV. | 1:strongly disagree – 7: strongly agree |
| 3. Efficiency Improvement | |
| What we have learned from the foreign partner helped us improve the efficiency of the JV's functioning. | 1:strongly disagree – 7: strongly agree |

| **INFORMAL LEARNING BEHAVIORS** | **Cronbach's $\alpha = 0.76$** |
|---|---|
| 1. Foreign Partner Motivation to Share | |
| How willing are the foreign partners employees to share their professional knowledge with the JV employees? | 1: not at all – 7: very much |
| 2. JV Motivation to Share | |
| How willing are the JV employees to share their professional knowledge with their foreign counterparts? | 1: not at all – 7: very much |
| 3. Get Along | |
| Our employees get along well with their foreign counterparts. | 1:strongly disagree – 7: strongly agree |
| 4. Social Contacts | |
| The contacts of our employees with their foreign counterparts extend beyond strictly professional ones. | 1:strongly disagree – 7: strongly agree |

| **FORMAL LEARNING BEHAVIORS** | **Cronbach's $\alpha = 0.86$** |
|---|---|
| 1. Joint Project Frequency | |
| In the course of one year, how often on average are teams encompassing representatives of both partners formed to work jointly on projects? | 0, 1, 2-3, 4-6, 7-10, 11-15, more |
| 2. Event Frequency | |
| In the course of one year, how often on average do representatives (of different levels) participate in various events organized by the foreign partner (e.g. conferences, yearly partner get-togethers)? | 0, 1-2, 3-5, 6-9, 10-14, 15-20, more |
| 3. HQ Training Frequency | |
| In the course of one year, how often do JV employees on average participate in training sessions organized by the foreign partner in Poland or at its headquarters? | 0, 1-2, 3-5, 6-9, 10-14, 15-20, more |
| 4. Foreign Partner Visits | |
| On average, how many times a year do the foreign partner representatives of different levels visit the JV? | 0, 1-2, 3-5, 6-9, 10-14, 15-20, more |
| 5. Polish Partner Visits | |
| On average, how many time a year do the JV representatives of different levels visit the foreign partner headquarters? | 0, 1-2, 3-5, 6-9, 10-14, 15-20, more |
| 6. Short termers | |
| On average how many foreign partner representatives are working in the JV on short term basis? | 0, 1-2, 3-5, 6-9, 10-14, 15-20, more |

| CULTURAL DISTANCE | Cronbach's $\alpha = 0.64$ |
|---|---|
| 1. Difference in Mentality | |
| Our mentality and the mentality of the foreign partner are similar. | 1:strongly disagree – 7: strongly agree |
| 2. Difference in Business Practices | |
| The foreign partner's way of doing business is similar to ours. | 1:strongly disagree – 7: strongly agree |
| 3. Differences in Organizational Culture | |
| The organizational culture and the management style of the foreign partner significantly differ from ours. | 1:strongly disagree – 7: strongly agree |

| SINGLE-ITEM VARIABLES | |
|---|---|
| 1. Separate entity | |
| Was the JV formed by way of separate entity creation or a minority share acquisition? | Yes/No |
| 2. Shared ownership | |
| What is the equity share held by the foreign partner in the JV? | 1 if 40-59.9, 0 otherwise |
| 3. JV age | |
| What year was the JV formed? | recoded with 2002 as reference year |
| 4. Prior ties | |
| Have you collaborated with the foreign partner in any form in the past? | Yes/No |
| 5. Prior country experience | |
| In the past, have you collaborated with another firm from the country from which your current partner originates? | Yes/No |

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