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***Partnering relationships in construction: a literature review***

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# **Partnering relationships in construction: A literature review**

## **Abstract**

There is no unified view as to what partnering in construction actually is. Particularly the relationship dimension of the concept is unclear. The purpose of this paper is to examine the literature in order to identify the main assumptions about partnering relationships in construction research and practice. The literature is compared to the Construction Industry Institute's (CII 1991) frequently cited definition of partnering as a long-term commitment between two or more parties in which shared understanding and trust develop for the benefits of improving construction. The literature review reveals a tendency to focus on project partnering in dyads between clients and contractors and there is also an emphasis on formal tools to develop these relationships, even if social aspects and relationship dynamics are recognised. The paper discusses these findings and suggests that, in order to increase the understanding of the substance and function of partnering relationships, it could be useful to incorporate knowledge from theoretical perspectives that are more in line with the CII definition. Two perspectives that seem particularly interesting in this respect are Supply Chain Management (SCM) and the Industrial Network Approach (INA), both of which focus on long-term relationships between actors beyond the dyad. INA also emphasises the informal aspects of relationship development. Incorporating these dimensions of partnering relationships requires processual and longitudinal studies, which are relatively rare in the contemporary partnering literature.

Keywords: Construction industry, partnering relationships, literature review

## 1. Introduction

Like trends in other industries, partnering has been introduced into the construction industry (CII, 1991; Latham, 1994; Bennett and Jayes, 1995; Egan, 1998). In fact, it has even been described as “the most significant development to date as a means of improving project performance” (Wood and Ellis, 2005, pp. 317) and it represents a fundamental shift from the traditional adversarial relationships in construction. Different approaches and applications of the concept have developed, which have “captur[ed] a wide range of behaviours, attitudes, values, practices, tools and techniques’ (Bresnen and Marshall, 2000a, pp. 231). It is generally agreed that there is no unified understanding of the concept (Nyström, 2005; Li, Cheng and Love, 2000), even though much of the literature refers to the Construction Industry Institute’s (CII) definition of partnering:

“A long-term commitment by two or more organizations for the purpose of achieving specific business objectives by maximising the effectiveness of each participant’s resources. This requires changing traditional relationships to a shared culture without regard to organization boundaries. The relationship is based upon trust, dedication to common goals, and an understanding of each other’s individual expectations and values. Expected benefits include improved efficiency and cost-effectiveness, increased opportunity for innovation, and the continuous improvement of quality products and services.” (CII, 1991, p. iv)

Despite great interest, efforts to implement the partnering concept in the construction industry are yet to yield the positive effects that have occurred in other industrial contexts (Winch, 2000). This perceived underperformance is explained by the tendency to focus on dyadic relationships between clients and main contractors while neglecting the importance of involving sub-contractors and suppliers (Dainty, Briscoe and Miller, 2001; Miller, Packham

and Thomas, 2002). Tools and techniques to design relationships are emphasised at the expense of the social and evolutionary aspects (Bresnen and Marshall, 2002). In other words, it seems as though the prevailing views and practices actually contradict the original intention of the CII definition above.

The purpose of this paper is to identify how previous construction literature has defined and used the concept of partnering. In particular, the paper focuses on the relationship dimension, which, despite having attracted increased interest (e.g., Rahman and Kumaraswamy, 2004; Anvuur and Kumaraswamy, 2007), is still unclear and requires a more in-depth understanding (Cox and Thompson, 1997; Bresnen and Marshall, 2002; Kadefors, 2004; Mason, 2007). Based on the CII-definition, three key dimensions of partnering relationships – relationship duration, the relationship partners and how the relationships develop - are identified. The paper undertakes a systematic and extensive review of the literature and scrutinises prior studies in relation to assumptions of the three dimensions. The results of the review are discussed in light of two theoretical perspectives on business-to-business relationships: Supply Chain Management (SCM) and the Industrial Network Approach (INA). Insights from these two perspectives may contribute to the understanding of partnering relationships because they deal explicitly with the three abovementioned dimensions of relationships. The main goal of SCM is to improve performance by establishing close relationships between the upstream and downstream actors in the supply chain and by integrating their respective activities and systems (Power, 2005). INA offers a framework for understanding how companies interact, how this interaction develops over time, resulting in long-term relationships, and how the relationship between two actors is influenced by the respective actors' relationships with other actors, i.e. the network (Håkansson and Snehota, 1995). Both perspectives are developed within other industrial contexts in which the focus on partnering,

long-term relationships and cooperation in supply chains and networks develops further than it does in the construction industry. These perspectives are increasingly being adopted in construction (e.g., Saad, Jones and James, 2002 and Dubois and Gadde, 2000; 2002) and, in many ways; do comply with the CII definition of partnering. Nevertheless, they are seldom referred to in what this paper has defined as the partnering literature. This paper suggests that these two perspectives could help clarify the partnering concept by providing insights and guiding theories of relationships in line with what is lacking, according to previous research (e.g. Kadefors, 2004). Particularly they illustrate how the three dimensions derived from the CII definition and discussed by examining the partnering literature relate to each other. The paper argues that this understanding has implications for how to study partnering relationships in construction.

The next section presents the study's research method. Section 3 reports on the findings from the review of the partnering literature in relation to the literature for each of the relationship dimensions identified above, as well as patterns of how the three dimensions are combined. Section 4 discusses the findings in relation to SCM and INA and how these two perspectives can contribute to a further understanding of the function and substance of partnering relationships. The paper concludes with implications and suggestions for future research.

## **2. Method**

This paper is based on findings from what Cooper (1989) called a theoretical review. The paper explores how the literature on partnering in construction treats the three aspects of relationships identified in on the CII definition: relationship duration, the parties involved and the content in terms of how relationships develop. This section presents the methodology for

choosing, describing and classifying key ideas and main concepts, in accordance with the recommendation of Hart (1998).

### **2.1. Selecting journals and papers**

The review involved searching for ‘peer-reviewed journals’ in ‘Business Source Complete’ from the CII definition from 1991 to June 2009. A total of 233 articles were identified that had abstracts containing ‘partnering’ in combination with ‘construction’ (165), ‘contractors’ (54) and ‘sub-contractors’ (14), respectively. Once the lists were cleaned for double-counting and once anonymous articles, book reviews, abstract overviews and editor’s notes were excluded, this resulted in a database of 154 articles published in three types of journals: (1) Internationally refereed construction journals, including *Construction Management & Economics*, *Building Research and Information*, *Engineering, Construction and Architectural Management* and *Journal of Construction Engineering and Management*;<sup>1</sup> (2) Internationally refereed journals, including *International Journal of Project Management*,<sup>2</sup> *Journal of Management in Engineering*<sup>3</sup> and *Long Range Planning*; and (3) Non-refereed professional journals, including *Civil Engineering* and *Dispute Resolution Journal* (formerly *Arbitration Journal*)<sup>4</sup>. The total of 154 articles was reduced to 87 articles after 67 articles were rejected for one or more of the following reasons:

- The word ‘construction’ was used in a different meaning
- The word ‘partnering’ was used in a different meaning or setting
- ‘Partnering’ was mentioned but not discussed.
- Articles were published in journals of type (3) but were not considered to be research articles (lack of references, no discussion of theory or method, etc.)

In line with the approach taken by Li, Cheng, and Love (2000), the current study opted to base the literature review strictly on the results from the selection procedure. Therefore, often-

cited reports and publications were not included as part of the review but were instead used as the starting point (CII 1991) and background (Latham, 1994; Bennett and Jayes, 1995; Egan, 1998) of the discussion. This also means that papers on relationships in construction that do not use the word ‘partnering’ are not included in the review, as we aim at understanding partnering relationships and not construction relationships in general.

## **2.2. Coding and analysing results**

Conceptual and empirical articles were included and coded according to how partnering relationships are viewed in the discussion of the concept or used as the basis for the empirical studies. In other words, the main focus of the articles and their intended contribution to the discussion are used as points of reference. Hence, the results from the empirical studies, such as partnering in practice, did not form the basis for the coding of papers. Four criteria were used to classify the papers: (1) Type of study – literature review/survey/case study/qualitative study/simulation, (2) Relationship duration – strategic/project/both/not specified, (3) Relationship partners (i.e., who/how many are involved) – Dyad (who)/Multi (who, not specified), (4) Relationship development – engineered/evolutionary/both/not specified. The latter was operationalised using Bresnen and Marshall’s (2002) conception of the development of partnering relationships as an engineered process as opposed to an evolutionary one. Engineered processes focus on the implementation of partnering through formal and systematic tools and techniques, including rigorous selection procedures, contracts and financial incentive systems, charters, dispute resolution procedures and teambuilding exercises such as workshops and the use of facilitators. Evolutionary processes, on the other hand, focus on the social, dynamic and informal aspects of partnering, including an acknowledgement of the complexities of relationships between organisations and individuals

and the styles of organisation and management adopted and project team dynamics, as well as structural and cultural dimensions.

The articles were categorised based on their primary focus. For example, articles that focused on different formal tools to develop partnering relationships were coded within an “engineered” category, even if they acknowledge the importance of social aspects and relationship dynamics. The coding of empirical papers was based on two categories: (1) Questions posed in surveys, such as, ‘Do you practice project partnering and/or strategic partnering?’ (relationship duration), ‘With whom do you have partnering arrangements: clients, sub-contractors?’ (relationship partners), ‘How do you develop and maintain relationships with your partners?’ (relationship development); and (2) ‘Who are the respondents (in surveys) or the case companies (in case studies): client, contractor, etc.?’ The coding of conceptual papers was based on our understanding of the reading of the text. In cases where it was difficult to place an article, the validity in terms of categorisation was improved by having two researchers who discussed and resolved discrepancies. There will always be disagreements regarding categorisations such as the one undertaken here. However, readers can cross-check the results presented in Table A1 (see the Appendix), which improves the reliability.

### **3. Partnering – results from the review**

Starting with a summary of the mainstream view of relationships, as presented in the partnering literature within construction in Table 1, the following sections present the results for each of the three key dimensions as well as how the literature has observed them in combination.



INSERT TABLE 1 HERE

### **3.1. Relationship duration**

The literature commonly distinguishes between project and strategic partnering. The former refers to a specific project and focuses on short-term benefits, while the latter represents a more long-term commitment between partners across several projects (Winch, 2000; Cheng and Li, 2001; Beach, Webster and Campbell, 2005). Some researchers have seen project partnering as the first step towards long-term strategic partnering (Kubal, 1996, Thompson and Sanders, 1998; Cheng, Li and Love, 2000), considering the latter as a more mature form (Ellison and Miller, 1995). The review reveals a considerable emphasis on project partnering, which is in line with earlier literature (Bresnen and Marshall, 2000a). Most of the papers, both conceptual (e.g., Anvuur and Kumuraswamy, 2007) and empirical (such as papers by Chan and colleagues on partnering projects in Hong Kong) focus on the benefits of partnering for individual projects and how to achieve these. A good example of this project emphasis is one of the first major contributions on partnering, that of Larson (1995). His working definition of project partnering was “a method of transforming contractual relationships into a cohesive, project team with a single set of goals and established procedures for resolving disputes in a timely and effective manner” (Larson, 1995, p. 30). His study of 280 projects found that partnering projects achieved results that were superior to those of projects that were managed in a traditional way.

Some researchers have observed that the focus on project partnering is somewhat paradoxical. As Beach et al., (2005) remarked, “questions remain as to whether an environment which is frequently characterised by one-off contracts and short-term gains is capable of supporting a concept which is based on mutual trust and long-term collaboration” (p. 612). The tendering

procedures and public procurement regulations are perceived as the main factors that contribute to the maintenance of the traditional short-term and often adversarial relationships in construction.

### **3.2. *Relationship partners***

Previous reviews have found that partnering research primarily concerns dyadic relationships, particularly between clients and main contractors (Bresnen and Marshall, 2000a; Li et al., 2000). To a large extent, this is confirmed in the present study, given that more than half of the papers concern dyadic relationships between clients and main contractors (e.g., Larson, 1995; 1997). These findings are also in line with the prevailing focus in practice. Fortune and Setiwan (2005), for example, found that 30 percent of the 43 client organisations they studied that had partnering arrangements with contractors did not have similar arrangements with design or consultant firms. Similarly, other studies have shown that while contractors encourage partnering arrangements with clients, they also pursue conventional approaches towards suppliers at the same time (Bresnen and Marshall, 2000c; Packham, Brychan and Miller, 2003). Humphreys, Matthews, and Kumuraswamy (2003) and Dainty et al. (2001) explained this practice by arguing that sub-contractors and suppliers are sceptical about partnering. Those studies found that these actors consider partnering to be a way for contractors to transfer costs upstream, thereby reducing the suppliers' margins.

Some of the papers in the review have taken multiple actors into account, often referring to the 'project team' or 'key participants'. For example, Packham et al. (2003) emphasised the need to "ensure that all contracting parties subscribe and adhere to the true nature of the partnering philosophy" (p. 332). Specifying the individual members or participants is rare, even if they are sometimes referred to as constellations of representatives of the client,

consultants/architects and contractors (e.g., Brown, Ashleigh, Riley and Shaw, 2001; Wong, Cheung and Ho, 2005; Anvuur and Kumuraswamy, 2007). Because the consultant often represents the client, it may be reasonable to consider these arrangements as dyadic, at least in practice. Therefore, even if many of the articles in the review embrace a multi-actor perspective, few explicitly consider sub-contractors and suppliers.

### **3.3. Relationship development**

The ways in which relationships develop and the degree of formality with which this occurs is a common topic of discussion in the literature. The review showed that the primary focus of many of the articles was on formal tools, such as selection procedures, workshops, TQM, charters, facilitators and measurements, as well as the ‘critical success factors’ needed to develop partnering relationships and achieve the promised benefits (e.g., Ellison and Miller, 1995; Jacobson, and Choi, 2008). Bayliss, Cheung, Suen, and Wong (2004), for example, studied the effectiveness of partnering tools such as workshops, review meetings and incentives in terms of their ability to “instil, foster and maintain the partnering spirit” (p. 261). By emphasising the formalised aspects and different techniques, systems and procedures, it is possible to achieve a more instrumental view of partnering. This assumes that trust and collaboration can be engineered where partnering is considered to be just another type of contract between partners (Bresnen and Marshall, 2000a). Wong and Cheung (2004) added an interesting point to the debate by arguing that, in contrast to traditional types of trust, construction may instead rely on ‘system-based trust’; that is, “legally binding agreements and terms where trust relies on the formalised system rather than in personal matters” (p. 444).

Despite the focus on formal tools, many observers have acknowledged the need to account for informal aspects, such as social dynamics and cultural-structural aspects. The most prominent

advocates of this view are probably Bresnen and Marshall. Their 2002 article elaborated on this issue, illustrating how the nature and quality of a client-contractor relationship depends upon the interplay between formal integrative mechanisms and the social dynamics of the relationship. Another example is Kadefors (2004), who argued for the usefulness of formal tools such as incentives and team-building activities to facilitate trust in partnering relationships, while at the same time calling attention to behavioural and cultural aspects of relationship development. Hence, many of the papers include both formal and informal aspects of how partnering relationships develop. Nevertheless, the review reveals that few researchers have actually dug further into how these informal aspects can be handled.

### **3.4. *Patterns of combinations of the three dimensions***

In order to identify combination patterns of the three dimensions, Figure 1 below (see appendix A1 for details) classifies papers according to three categories of each dimension: relationship development (engineered, social and evolutionary aspects or both), duration (project, strategic or both) and number of actors involved (dyadic, multiple or both).

INSERT FIGURE 1 ABOUT HERE

The analysis provided several noteworthy findings. It is clear that, to a large extent, that the basic proposition is correct: there is a clear focus on project partnering at a dyadic level, and many of the articles in the review focus on formal tools to “engineer” partnering, even if they also acknowledge informal aspects. A typical example is the work by Larson (1995; 1997), which studied project partnering between owners and contractors and considered project partnering to be “a formal management intervention designed to overcome the tendency to manage projects in an adversarial fashion” (Larson 1997, p. 188). None of the papers deal

with partnering in a strategic, multi-actor and purely evolutionary sense. There may be a number of explanations for this. Firstly, the literature appreciates the interplay between formal and informal aspects; partnering without any type of formal tools is rare. Wood and Ellis (2005) provided an example of one of five papers that focused on the evolutionary perspective, studying social aspects and culture change in a project over time. Secondly, papers that adopt a strategic and evolutionary perspective do not include multiple actors, which may be explained by the fact that the prevalent perspective in practice is dyadic (e.g., Bresnen and Marshall, 2000c). Many projects are initiated by public clients, focusing on their relationships with the main contractor. Further, because strategic partnering is not possible in such circumstances, the literature is primarily concerned with project partnering. Even if there are no legal restrictions on contractors' upstream relationships towards suppliers, few papers explicitly deal with the involvement of sub-contractors and suppliers. Unsurprisingly, therefore, few of the papers study long-term arrangements between multiple actors. An interesting exception is Cheng, Li, and Love (2000), who studied an initiative by several companies, including owners, architects, contractors and subcontractors, to establish a long-term arrangement that motivated by increased competition and a need to focus on core competences. Another interesting example is Lau and Rowlinson (2009), who compared inter-firm and inter-personal trust in partnering and non-partnering arrangements and took all categories of all dimensions into account. However, they did not study the partnering *process* (p. 552) and their study only concerned the development of *trust* in partnering versus non-partnering projects.

Finally, there does not seem to be any difference between older and more recent partnering studies. Recent papers could be expected to have an approach that is more in line with the original CII-definition, yet 75 percent of the papers with a dyadic engineering perspective in

projects were published after 2002. This may be explained by the fact that studies of the evolutionary aspects of strategic partnering between multiple actors require extensive processual and even ethnographic approaches, which makes such studies rare in the construction field.

## **4. Discussion**

The review shows that, to a large extent, the construction literature on partnering deviates from the CII (1991) definition. In addition, in comparison to how partnering has been applied in other industries, mainstream thinking in construction is short-termed. In the automobile industry, for example, long-term relationships and the involvement of supplier networks have become a key means to achieve competitiveness (Dyer and Nobeoka, 2000). This view is also highly valued in different perspectives on business-to-business relationships, such as SCM and INA. Although these perspectives have been developed based on research on manufacturing industries, they are gaining a growing following in construction literature. The question is whether construction can overcome its strong project focus and incorporate what has proven to be essential for adding value in relationships. The following section discusses how SCM and INA may add knowledge to how partnering can be developed and, in so doing, answer the call for alternative theoretical approaches to partnering (Bresnen, 2007; Bresnen and Marshall, 2000c), particularly how such relationships can be understood (Kadefors, 2004). A basis for future research is developed by using papers that do not follow the mainstream approach of project, dyadic and engineered perspectives in relation to SCM and INA. Whereas the following three sections discuss each dimension separately, section 4.4 summarises the differences and similarities between SCM and INA and provides examples of previously published partnering papers on which to build further research.

#### **4.1. A long-term perspective on relationships**

Stability and continuity are considered vital for productivity and innovation in SCM and INA. The purpose of SCM is to improve performance by integrating activities in the chain through close relationships between the actors involved (Power, 2005). In recent years, SCM has become very popular within construction research and practice (see, for example, Vrijhoef and Koskela, 2000). The primary focus has been on creating integrated and efficient supply chains in individual projects. Several researchers have noted that, even if integration is costly and takes time to become beneficial, it is possible because many projects last for several years and/or include repetitive processes. Anderson and Polkinghorn (2008) illustrated this in their study of the replacement of the Woodrow Wilson Bridge in the United States. As they noted, “The duration is long: thirteen years of construction, allowing plenty of time for issues to develop and relationships to sour” (p.171). The increase in industrialisation in construction has included shifting activities from the construction site to in-house production facilities, which increases the likelihood of the importance of long-term relationships being recognised. The result of this is that construction will become more similar to the manufacturing settings in which SCM was first applied.

Although INA has not attracted as much attention in construction as SCM, there is an increasing interest in relationship dynamics and network issues (see, for example, Dubois and Gadde, 2000; 2002). The purpose of INA is to provide an understanding of the substance of relationships in terms of how activities, resources and actors are connected and the effects that these connections have for the companies, the relationship and the network (Håkansson and Snehota, 1995). According to INA, long-term relationships and adaptations are a key source of added value because they help reduce the need to climb a new learning curve in every new project, thereby facilitating return on investments (Dubois and Gadde, 2000; 2002). They also

create possibilities for innovation because the parties have time to learn and find new solutions. In his study of contractor-client relationships, Eriksson (2007) argued that long-term partnering arrangements are the ultimate goal because they increase the incentives for cooperation. In another study, Eriksson and Nilsson (2008) referred to a partnering project between a client and a main contractor who had previously cooperated in many projects, but these were not based on a strategic partnering agreement. Hence, even if this study concerns project partnering, previous experiences probably had a positive influence on the partnering project, which was therefore based on long-term cooperation. Similarly, Love, Tse, Holt and Proverbs (2002), argued that a long-term focus is needed to foster learning because short-term relationships imply individual motives and goals, which may actually hinder the development of trust, common objectives and commitment to the relationship. The partnering literature also recognises the importance of a long-term orientation, therefore, despite the project focus. For example, some of the papers in the review question whether an environment that is frequently characterised by one-off contracts and short-term gains is actually capable of supporting partnering based on mutual trust and long-term collaboration (Bresnen and Marshall, 2000a; Beach et al., 2005).

#### **4.2. *A multi-actor perspective on relationships***

SCM and INA both emphasise the importance of creating relationships with suppliers. Suppliers are important because they provide important input into processes, which can contribute to productivity and innovation. Actors relate to different counterparts and chains at the same time and the benefits of specific relationships must exceed the costs of involvement; that is, the time spent and the adaptations required. Recent research within SCM has shown that the integration of specific chains may have adverse effects on other chains because there is a trade-off between adaptation in one chain and adaptability to others (Gadde and



Håkansson, 2001; Jahre and Fabbe-Costes, 2005). In construction, this means that partnering and adaptations among the partners in one project might hinder similar adaptations with partners in other projects. Dubois and Gadde (2002) suggested that this could be solved by tightening the couplings in the permanent network, in other words, establishing long-term relationships between partners across different projects and loosening the couplings in the temporary project network. This would mean that adaptations in the permanent network would enhance performance across temporary networks rather than hinder it.

Even if partnering is confined to two or a few parties, it is likely to affect other actors involved in the project. A construction project consists of a network of different actors and their respective resources and activities. Partnering relationships will influence and be influenced by the various actors due to the interdependencies that exist in such projects (Dubois and Gadde, 2002). The scepticism towards partnering that has been reported from sub-contractors and suppliers may relate to a lack of understanding of the implications for those actors that are directly involved or indirectly affected and for the effectiveness of the overall project. It may also relate to how partnering is presented with regard to who should be involved and how their opinions will be taken into account. The partnering literature and SCM both commonly regard the main contractors as the drivers of partnering. It is likely that large companies, such as main contractors, drive change and the adoption of new concepts. However, INA studies have shown how smaller actors can drive innovation and change (Håkansson and Waluszewski, 2002). This means that the involvement of other parties is important since product and process innovations often come from suppliers, architects and consultants and from the collaboration between them. The horizontal relationships between suppliers are therefore important for learning and may also be beneficial for the focal relationship between the main contractor and each of the suppliers. Benefits may be gained

because these connections provide a more extensive knowledge-base from which the parties can learn (Håkansson and Snehota, 1995). Few studies of partnering have considered the importance of connections between relationships for improved performance or emphasised the other relationships of the partnering partners as a critical success factor for partnering. Given that a main purpose of partnering is the “maximising of each participant’s resources” (CII, 1991), these actors and relationships deserve attention, since, according to INA, a company’s most valuable resource is its relationships (Håkansson and Snehota, 1995).

The review identified only a few studies that focus specifically on the role of sub-contractors and suppliers (e.g., Humphreys et al., 2003; Eom, Yun, and Paek, 2008). For example, Beach et al. (2005) argued for the importance of allowing specialist subcontractors and key manufacturers to have access to the client during the early stages in order to make use of the advantages of their special competence. Similarly, Kubal (1996) found that a strategic partnering agreement between a client, contractor, sub-contractors and suppliers greatly improved the quality of the project. Shields and West (2003, p. 341) summarised this point as follows: “There are minimal profit margins now for contractors; the only way to get your margin is to work very closely with sub trades and suppliers. Give your supplies good lead time, think about long term planning, build harmony among the trades. Then everyone goes home with money in their pocket”. Together, these findings suggest that partnering could benefit from a broader scope that includes these types of actors and their competencies.

#### **4.3. A dynamic and social perspective on relationship development**

While SCM emphasises the formal means for developing relationships through management techniques and tools (Gripsrud, Jahre and Persson, 2006), INA emphasises the informal aspects (Håkansson and Snehota, 1995). The two perspectives differ particularly in relation to

the importance of contracts. The SCM literature considers contracts to be important for the purpose of ‘transaction specific investments’; Elliman and Orange (2000, p.347) argued that they are viewed as “the primary means to regulate relationships” in construction. INA, on the other hand, pays greater attention to the social content and evolutionary aspect of relationships, in addition to the technical and economic side. As a result, INA argues that relationships may take an unplanned direction, which shows that a relationship is more than just a formal contract between two parties.

Much of the partnering literature refers to partnering as a formal contract or agreement between two or more parties that depicts the responsibilities of each partner. However, some researchers have argued that partnering is primarily about creating an atmosphere and culture of trust and shared understanding, which reflects a spirit of cooperation (Bresnen and Marshall 2000a). Partnering, on the other hand, is considered more of a gentlemen’s agreement (Black, Akintoye, and Fitzgerald, 2000) than, for example, alliances that are based mainly on contracts (Yeung, Chan, Chan, and Li, 2007). According to Kadefors (2004), contract negotiation may be seen as contradictory to the basic premise of trust in partnering (Kadefors, 2004). Wong and Cheung (2004), however, argued that construction is characterised by system-based trust characteristics in which contracts actually facilitate such trust. Similarly, Rahman and Kumaraswamy (2004) argued that partnering is a good example of practising relational contracting principles that focus on ‘dynamic’ and flexible contracts. The focus on both contracts and relationship dynamics is reflected in assumptions about how relationships develop in general. Many of the papers in the review have emphasised the interplay between formal and informal mechanisms that allow partnering relationships to develop.

The emphasis on both the formal tools and the informal aspects of partnering relationships in the literature indicates an acknowledgement of the relationship complexities and dynamics; at the same time, it also offers useful guidelines for how such relationships can be facilitated. In this sense, the review offers a nuanced view of the prior criticisms that partnering is only concerned with tools and techniques.

#### **4.4 Summary: Developing an understanding of partnering relationships**

Table 2 summarises the main similarities and differences between SCM and INA in the three relationship dimensions. Below is a discussion of how insights from these two perspectives can be combined with specific papers in order to identify opportunities for further research.

INSERT TABLE 2 APPROXIMATELY HERE

Section 3.4 illustrated that the three dimensions are related in various ways. For example, the question of how relationships develop is tightly coupled to the duration of the arrangement. As Kwan and Ofori (2001) noted, relationships evolve over time, which necessitates a strategic approach rather than a project-oriented one. The fact that much of the literature focuses on project partnering may explain the great emphasis on formal mechanisms to facilitate relationships. According to Lau and Rowlinson (2009), project partnering is likely to create inter-firm trust, which can be facilitated by formal means and management tools; strategic partnering, on the other hand, produces inter-personal trust, which requires attention to be paid to the informal aspects of relationships.

SCM and INA both argue for the inclusion of multiple actors in long-term relationships. A key question is who to involve in a partnering arrangement and, in particular, who to establish

a long-term partnering relationship with. The main idea in SCM is that supply chain integration should involve the most important suppliers, customers and/or products (Cox and Ireland, 2002). Likewise, INA argues that if a supplier is involved in the customer's most important activities and/or provides important resources, such as knowledge and products, a long-term relationship should be pursued (Gadde and Snehota, 2000). There will be a trade-off related to the benefits of adaptations in such relationships and standardisation. While INA argues that adaptations to one particular relationship partner may be beneficial for that particular relationship (Håkansson and Snehota, 1995), SCM argues that standardisation may ensure continuity and create efficiencies both within and between relationships (Gibb, 2001; Sánchez-Rodriguez, Hemsworth, Martinez-Lorente, and Clavel, 2006 ).

While the potential partners must be considered, so too must their connections to other parties. According to INA a relationship is heavily influenced by the respective partners' other relationships. In this respect, it is interesting to note that the CII (1991) definition emphasises "changing traditional relationships to a shared culture without regard to organizational boundaries". INA complies with this definition, acknowledging that boundaries become more blurred as relationships develop and parties adapt to one another, even if there will always be a need to consider the company level, given that an actor is involved in various relationships and projects simultaneously. Therefore, a common objective in any partnering arrangement should be to not only achieve a good overall project performance but also to assure benefits for all the partners involved. A final point to note is that the most important partners may change over time, which necessitates continuous evaluation.

Dubois and Gadde's (2002) notion of loose and tight couplings in temporary (i.e., project) and permanent construction networks provides useful insights for further research into how

project partnering can lead to long-term relationships and vice-versa; that is, how project partnering can be used to develop strategic partnering (Kubal, 1996). It also showed how repeated transactions can result in a relationship that leads parties to decide to conduct a partnering project (Eriksson and Nilsson, 2008). Although references are often made to Dubois and Gadde (2002), the partnering research has hardly looked further into the interplay between long-term partnering relationships and the project-based nature of construction, the implications for those involved and how relationships are likely to develop.

As noted in section 3.4, the study of strategic partnering between multiple parties and the incorporation of informal aspects is likely to require specific types of studies, such as in-depth process studies, that have been infrequently used in prior literature on partnering in construction.

There are two interesting exceptions. The first is the study by Lau and Rowlinson (2009), which applied qualitative methods to compare partnering and non-partnering arrangements. These authors collected and analysed an extensive amount of qualitative and quantitative data to reveal long-term and project-specific, dyadic and multi-actor, formal and informal aspects of relationship development, with a particular focus on trust. Their study revealed that partnering arrangements tend to display more inter-firm trust that was reinforced by various management tools, whereas non-partnering projects tend to display interpersonal trust, which is not easily cultivated. Their study noted that “High interpersonal trust is hard to cultivate in a multi-party working situation, even though partnering has been adopted. It is fair to say that inter-firm trust is grounded in the control mechanism such as the open information system, while interpersonal trust is grounded on different foundations including the emotional component such as in ‘faith’”( p. 551). They went on to argue that the effects of partnering are

integration and balancing multi-party interests. Lau and Rowlinson (2009) concluded by acknowledging that the process of partnering must be studied in order to further delve into the organisational dynamics of such relationships.

The second exception, Kaluarachchi and Jones (2007), exemplifies the type of study that Lau and Rowlinson (2009) proposed. They used a case study and action research to monitor and record the performance of 12 projects over a period of time. Their study focused on the “roles played by a complex team network in contributing to an innovative partnering agreement” (p. 1053). By studying the processes through which these relationships develop, Kaluarachchi and Jones (2007) acknowledged the importance of a dynamic perspective of partnering and of understanding the connections between relationships. Their study is a valuable example of how studies aimed at revealing evolutionary aspects over time across multiple actors can be undertaken.

## **5. Conclusions and implications for future research**

This paper started with the argument that there is insufficient understanding of the relationship dimension of partnering and that a better understanding of the substance and function of relationships could open the ‘black box’ of construction relationships (Kadefors, 2004). This paper has made two main contributions: (a) A systematic review of literature on partnering in construction that identifies and examines the current understanding of partnering relationships, and (b) Suggestions for how two theoretical perspectives that have attracted recent attention in construction but not in relation to partnering – SCM and INA – could provide valuable insights of relationships that would help clarify the partnering concept. Based on this review, it can be concluded that previous studies have focused on project partnering, particularly between clients and contractors, but have paid little attention to the

role of sub-contractors and suppliers or the multi-actor nature of construction. In addition, much attention has been devoted to how relationships can be developed through formal means, highlighting critical success factors for achieving the benefits of partnering, even if the interplay between formal and informal means is appreciated. The discussion illustrates that the long-term orientation involving actors beyond the dyad, as proposed in SCM and INA, and the focus on social and informal evolution of relationships in INA can provide valuable insights into the substance and function of relationships in construction and can form an important basis for further development of the partnering concept.

The discussion in this paper has four major implications for practice. Firstly, it illustrates the importance of a long-term orientation but also emphasises the difficulties that this poses in practice. It also stresses the importance of prioritising decisions about whom to pursue strategic partnerships with. Secondly, companies should utilise the opportunities that lie in how relationships influence each other; for example, in terms of having a number of suppliers cooperating to develop and use the same standards and technologies across projects and stakeholders. Thirdly, companies must use opportunities to include informal aspects of relationship development in order to complement the strong present focus on the formal tools. Fourthly, companies must acknowledge the links between the three dimensions and develop them in combination. For example, a main contractor may achieve long-term benefits by creating a strategic supplier network. By connecting its most important suppliers, their respective resources and activities could be coordinated and integrated and an atmosphere of trust and shared understanding could be developed, which in turn would create a potential for enhanced performance.



The paper offers a number of avenues for future research, two of which are of particular interest. Firstly, appropriate research tools must be developed to study dynamic multi-party partnering arrangements in construction over time. This requires longitudinal process studies, as one must look at action patterns, sequences of events, critical shifts and changes in order to understand the dynamics of the process. This also means that the process must be studied from the view of various actors over time, including the long-term effects of partnering on the broader network of companies and vice versa. This has only been done to a limited degree in former studies of partnering. Again, insights from INA could be useful in this regard. This approach is developed based on in-depth studies of relationships, both dyadic and in networks (see, for example, Håkansson and Snehota, 1995; Håkansson and Waluszewski, 2002). In line with SCM, INA emphasises the role and importance of suppliers in their studies and researchers within INA has developed research tools that are designed to study customer-supplier relationships. Since the literature review identified a lack of research on partnering with suppliers and sub-contractors, future studies should aim to fill this void. INA could provide interesting research tools in this respect. It is important to remember that SCM and INA have both been developed based on experiences from other industries. It is important, therefore, to adapt the research tools that have originated from these two perspectives to the particular setting of construction, incorporating the project-based nature of construction.

Secondly, it is likely that the partnering concept will continue to undergo further development. The question is whether partnering will develop as in other industries where long-term orientation and multi-actor perspectives are already applied (e.g., the automotive industry), or whether the specificities of construction will necessitate other directions. In order to capture the development, it would be interesting to study the development and use of the partnering concept in different institutional and national settings. For example, while

partnering has been applied in the UK and in South-East Asia for some time and has reached a “mature” state, it is still in its infancy in many of the Nordic countries. Comparing these different settings could provide an important indication of whether what needs to be changed is the way in which the partnering concept is approached in the literature and in practice or the definition itself.

## Appendix 1

Table A1 lists the findings from the literature review, which includes 87 articles. The review shows the type of study presented in the articles and how each one approached the three key aspects. The review provided the following key results:

- Type of study: 31 articles based their discussion on surveys, 30 on case studies and 15 were purely conceptual/literature review articles. The remainder was a combination of other qualitative studies, simulations, etc.
- Relationship duration: 11 articles considered strategic partnering only, 44 considered project partnering, 27 considered both and the rest were not specific.
- Relationship partners: 48 articles dealt with dyadic relationships, mostly between clients and contractors but also between contractors and sub-contractors and clients-consultants, while 32 adopted a multi-actor perspective. Four of these included a triad – client, contractor and architect/consultant, 18 included sub-contractors/suppliers (in addition) and 11 adopted a multi-actor perspective without specifying who was involved (e.g., project team, all stakeholders, key participants, ‘two or more’). The remaining articles in the review did not specify who is involved.
- Relationship development: 42 articles focused on formal tools and techniques for achieving partnering; i.e., engineering of relationships. Six articles were based on ‘pure’ evolutionary and/or social/cultural aspects, while 33 included both perspectives. The remaining articles were not specific.

Table A1. Findings from the review of partnering literature

Article	Theme	Type of study	Duration	Partners	Relationship development
Anderson and Polkinghorn 2008	Managing conflicts in megaprojects	Case study	Project	Dyad: Client-contractor	Both: <ul style="list-style-type: none"> <li>- Engineered: conflict resolution techniques</li> <li>- Social dynamics – leadership styles, counterproductive behaviour</li> </ul>
Anvuur and Kumuraswamy 2007	Partnering concept	Conceptual	Project	Multi: Client, consultant, constructor	Engineered: Formal means – contracts, workshops and meetings, charters and procedures, risk-sharing incentives, even if social aspects are recognised
Barker and Naim 2008	Supply chain thinking in house-building	Survey	Not specified	Not specified	Engineered: Formal means – supply chain techniques
Barlow 2000	Innovation and learning	Case study	Project and strategic	Multi: Clients, contractors, consultants, suppliers, etc.	Both: <ul style="list-style-type: none"> <li>- Formal means – teambuilding and financial mechanism for risk sharing</li> <li>- Cultural-structural aspects</li> </ul>
Bayliss et al. 2004	Partnering tools	Case study	Project	Dyad: Client-contractor	Engineered: Formal tools – review meetings and incentivisation agreement
Beach et al. 2005	Partnership development	Survey	Project and strategic	Dyad: Contractor-sub-contractor	Both: <ul style="list-style-type: none"> <li>- Formal means – workshop, teambuilding, dispute resolution procedure</li> <li>- Cultural aspects</li> </ul>
Black et al. 2000	CSFs and benefits	Survey	Project and strategic	Dyad: Client-contractor/ client-consultant/ contractor-sub-contractor	Both: <ul style="list-style-type: none"> <li>- Formal means – contracts, selection procedures, teambuilding</li> <li>- Informal and social aspects –roles</li> </ul>
Bresnen and Marshall 2000a	Problems and dilemmas of partnering	Literature review	Project and strategic	Dyad: Client-contractor	Both: <ul style="list-style-type: none"> <li>- Formal means – incentives</li> <li>- Cultural-structural aspects</li> </ul>
Bresnen and Marshall 2000b	Motivation and incentives	Case study	Project, even if long-term orientation is recognised	Dyad: Client-contractor	Both: <ul style="list-style-type: none"> <li>- Formal means – incentives</li> <li>- Cultural-structural aspects</li> </ul>

Bresnen and Marshall 2000c	Factors encouraging and inhibiting partnering	Case study	Project, even if long-term orientation is recognised	Dyad: Client-contractor	Both: <ul style="list-style-type: none"> <li>- Formal means – incentives and teambuilding</li> <li>- Informal means and cultural-structural aspects</li> </ul>
Bresnen and Marshall 2002	Development of partnering relationships	Case study	Project and strategic	Dyad: Client-contractor	Both: <ul style="list-style-type: none"> <li>- Formal means – selection procedures and team integration mechanisms</li> <li>- Social processes and cultural-structural aspects</li> </ul>
Bresnen 2007	Paradoxes of partnering	Literature review/ Conceptual	Project and strategic	Dyad: Client-contractor	Both: <ul style="list-style-type: none"> <li>- Formal means – incentives</li> <li>- Cultural-structural aspects</li> </ul>
Brown et al. 2001	New project procurement process	Case study	Project	Multi: Client, consultant, contractor	Engineered: Systematic methodology involving a formal and standardised selection procedure
Chan et al. 2003a	Partnering benefits	Survey	Project	Multi: Client, consultant, contractor, sub-contractor, construction managers and suppliers	Engineered: Formal means – control and resolution mechanisms, measurement tools, even if empowerment and authority are recognised
Chan et al. 2003b	Implementation barriers	Survey	Project	Multi: Client, consultant, contractor	Both: <ul style="list-style-type: none"> <li>- Formal means such as workshop, charter, facilitator</li> <li>- Cultural-structural aspects</li> </ul>
Chan et al. 2004	Critical success factors of partnering	Survey	Project	Multi: Client, consultant, contractor, sub-contractor	Both: <ul style="list-style-type: none"> <li>- Formal means – control and resolution mechanisms, regular meetings</li> <li>- Team dynamics – responsibilities and power</li> </ul>
Chan et al. 2008	Incentives and partnering success	Case study and document analysis	Project	Dyad: Client-main contractor	Engineered: Formal means – incentive agreements, even if structural aspects (bureaucratic organisation) are recognised
Chen and Chen 2007	Critical success factors of partnering	Survey	Project	Multi: Owner, designers, engineers, contractors, sub-contractors	Both: <ul style="list-style-type: none"> <li>- Formal means – meetings, facilitator, appropriate conflict resolution procedure</li> <li>- Dynamic and cultural aspects, adjustment over time</li> </ul>

Cheng et al. 2000	Critical success factors of partnering	Case study	Strategic	Multi: Client, consultant, designer, contractor, sub-contractor	Engineered: Formal means – workshop, facilitator, regular meetings, evaluation, conflict resolution procedure
Cheng et al. 2001	Infra-structure of partnering	Case study	Project	Multi: Client, designer, consultant, contractor, sub-contractor, supplier	Engineered: Formal means – workshop and computer-based tools
Cheng and Li 2001	Partnering process and Critical success factors of partnering	Survey	Project and strategic	Multi: Not specified	Engineered: Formal means – workshop, charter, regular meetings, facilitator (project partnering)
Cheng and Li 2002	Partnering process and Critical success factors of partnering	Survey	Project and strategic	Multi: Not specified	Engineered: Formal means – workshop, facilitator, team building activities
Cheng et al. 2004	Learning culture and strategic partnering	Conceptual	Strategic	Multi: Not specified	Engineered: Systematic model and formal means – plans, measurement, forums
Cheung et al. 2003	Behavioural aspects and trust	Case study	Project	Dyad: Client-contractor	Engineered: Focus on formal means – workshop and review meetings, even if trust building through experiences is recognised
Conley and Gregory 1999	Partnering for small construction projects	Conceptual	Project	Multi: client, contractor, designers/consultants, suppliers	Engineered: Formal means – workshop, charter, conflict resolution procedure, facilitator
Crane et al. 1997	Partnering process	Qualitative study	Project and strategic	Dyad: Client-contractor	Engineered: Systematic model and focus on formal means – selection procedures, workshop, charter, measurement – even if trust and communication developing passively over time is recognised
Dainty et al. 2001	Sub-contractors' perspectives	Qualitative study	Project and strategic	Dyad: Focus on contractor-sub-contractor	Engineered: Formal supply chain management techniques – quality management and integrated contractual system
Davey et al. 2001	Small Medium Enterprises and partnerships	Qualitative study	Project and strategic	Dyad: Client-SME	Engineered: Formal means – collaboration mechanisms, procedures and technologies

Domberger et al. 1997	Public-private partnering	Conceptual/empirical examples	Project and strategic	Dyad: Client-contractor	Engineered: Formal means in focus – workshop, charter, regular meetings, open books
Ellison and Miller 1995	Alternative dispute resolution techniques	Conceptual/Case study	Project and strategic	Dyad: Client – contractor in focus, even if the importance of ‘all stakeholders’ is recognised	Engineered: Formal means in focus – initial meeting, TQM, confidentiality agreement
Eom et al. 2008	Sub-contractor evaluation and management	Case study	Strategic	Dyad: Contractor-sub-contractor	Engineered: Formal means – evaluation and feedback model based on BSC
Eriksson 2007	Cooperation and control – prisoner’s dilemma	Qualitative study	Project and strategic	Dyad: Client-contractor	Engineered: Focus on rational decision making and long-term contracts as solution/tool
Eriksson and Laan 2007	Procurement effects on trust and control	Survey	Project	Dyad: Client-contractor	Engineered: Formal means – systematic procurement and ‘trust-breeding’ procedures, even if informal social control is recognised
Eriksson and Pesämaa 2007	Procurement effects on partnering	Survey	Project and strategic	Dyad: Client-contractor	Engineered: Formal means – systematic procurement procedures, even if partnering culture emergence is recognised
Eriksson et al. 2007	Procurement effects on sub-contractor involvement	Action research case study	Project	Multi: Client, main contractor, sub-contractors	Engineered: Formal means - systematic procurement procedures and ‘collaborative’ tools – team building events, dispute resolution techniques, facilitator
Eriksson et al. 2008	Barriers to partnering	Survey	Project and strategic	Dyad: Client-contractor	Engineered: Focus on purposeful partner selection and ‘collaborative tools’ to overcome barriers
Eriksson and Nilsson 2008	Partnering procurement procedures from a TCE perspective	Case study and survey	Project	Dyad: Client - contractor	Engineered: Formal means - systematic procurement procedures, even if social embeddedness due to repeated interaction is recognised
Fisher 2004	Partnering and conflict resolution	Case study	Project	Multi: Client, contractor, architect	Engineered: Formal means – workshop, charter, conflict resolution procedure, facilitator
Fortune and Setiawan 2005	Partnering practice in housing associations	Survey	Strategic	Dyad: Client-contractor	Engineered: Formal means – Open book, risk analysis, standardisation
Glagola et al. 2003	Partnering in public sector	Survey	Project	Multi: Client, contractor, sub-contractors,	Engineered: Formal means – workshops, charter, conflict resolution procedure, facilitator, even if evolutionary aspects over time are recognised

				suppliers	
Gransberg et al. 1999	Measuring partnering performance	Survey	Project	Dyad: Client-contractor	Not specified
Humphreys et al. 2003	From adversarial to collaborative relationships	Case study	Project and strategic	Dyad: Contractor-subcontractor	Both: <ul style="list-style-type: none"> <li>- Formal means – selection procedures and team building</li> <li>- Dynamic and social aspects – power relations</li> </ul>
Jacobson and Choi 2008	Success factors for public-private partnerships	Qualitative study	Project	Dyad: public-private entities	Engineered: Formal means – structured team building, communication and problem resolution mechanisms, regular meetings
Jones and Kaluarachchi 2007	Factors affecting strategic partnering	Case study and quantitative measures	Strategic	Dyad: Client (consortium)-contractor	Both: <ul style="list-style-type: none"> <li>- Formal mechanisms – selection procedures and implementation of KPI</li> <li>- Partnering and project team dynamics</li> </ul>
Kadefors 2004	Trust in project relationships	Conceptual	Project	Dyad: Client-contractor	Both: <ul style="list-style-type: none"> <li>- Formal means – incentives and team building</li> <li>- Dynamics, behavioural and cultural aspects</li> </ul>
Kadefors et al. 2007	Public clients' procurement practice	Case study	Project, but also focus on long-term	Dyad: Client-contractor	Both: <ul style="list-style-type: none"> <li>- Formalised process and systems – manuals and guidelines</li> <li>- Behavioural and cultural aspects</li> </ul>
Kaluarachchi and Jones 2007	Key criteria in the partnering process	Case study and action research	Strategic	Dyad: Client (consortium)-contractor	Both: <ul style="list-style-type: none"> <li>- Formal mechanisms – selection procedures and implementation of KPI</li> <li>- Partnering and project team dynamics</li> </ul>
Kanji and Wong 1998	Quality culture	Case study	Project	Multi: Client, contractor, consultant, sub-contractor and supplier	Engineered: Focus on formal means – creating a quality culture through TQM – systems and structures
Koraltan and Dikbas 2002	Applicability of partnering in Turkey	Case study	Project	Dyad: Client-contractor	Engineered: Focus on formal means – workshop, charter, conflict resolution system even if cultural barriers are acknowledged
Kubal 1996	Quality improvements through long-term	Conceptual	Strategic	Multi: Client, contractor, sub-contractor, supplier	Engineered: Focus on formal means – TQM and information technology tools



	relations				
Kumaraswamy et al. 2005	Relationally integrated teams	Survey	Project	Multi: Project team - not specified	Both: <ul style="list-style-type: none"> <li>- Formal means – facilitator, selection procedures</li> <li>- Dynamic and cultural-structural aspects</li> </ul>
Kwan and Ofori 2001	Chinese culture and partnering	Survey	Strategic	Dyad: Client-contractor	Cultural aspects of partnering
Larson 1995	Partnering and project success	Survey	Project	Dyad: Owner-contractor	Engineered: Focus on formal means – workshop, charter, conflict resolution procedures – even if project dynamics and evolving characteristics are recognised
Larson 1997	Partnering and project success	Survey	Project	Dyad: Owner-contractor	Engineered: Focus on formal means – workshop, charter, conflict resolution procedures – even if project dynamics are recognised
Lau and Rowlinson 2009	Inter-firm and inter-personal trust	Case study	Project and strategic	Both: Client, contractor, consultant and sub-contractor	Both: <ul style="list-style-type: none"> <li>- Formal means enable inter-firm trust to develop in partnering projects</li> <li>- Social aspects to enable inter-personal trust to develop, associated with more long-term relationships</li> </ul>
Li et al. 2000	Partnering models	Literature review	Project and strategic	Dyad: client-general contractor, client consultants, general contractor-consultants	Both: <ul style="list-style-type: none"> <li>- ‘Tactics’ for partnering formation – selection procedures, workshops, charter</li> <li>- Cultural-structural aspects – org. barriers</li> </ul>
Li et al. 2001	Co-operative benchmarking	Conceptual	Strategic	Multi: Not specified	Both: <ul style="list-style-type: none"> <li>- Systematic process for using benchmarking through formal means</li> <li>- Cultural-structural aspects – employee commitment and existing culture</li> </ul>
Love et al. 2002a	Learning and transaction costs in partnering	Case study	Strategic	Dyad: Client-contractor, even if occurrence of ‘two or more parties’ is noticed	Both: <ul style="list-style-type: none"> <li>- Formal means – contracts</li> <li>- Focus on dynamic and psychological dimensions – bounded rationality</li> </ul>
Love et al. 2002b	Model for partnering and learning	Case study	Strategic	Multi: Consultant-project team	Both: <ul style="list-style-type: none"> <li>- Formal means – TQM</li> <li>- Dynamics and cultural-structural aspects</li> </ul>

Lu and Yan 2007a	Evaluating partnering applicability	Literature review/ Survey	Project	Multi: Owner and project partners	Engineered: A systematic model with focus on formal means – workshop, charter and conflict resolution system
Lu and Yan 2007b	Incentives of partnering	Survey	Project and strategic	Not specified	Engineered: Formal means – team building sessions, review meetings, workshop
Manley et al. 2007	Public-private sector partnering	Practical examples	Project	Multi: Not specified	Engineered: Systematic model of implementing partnering even if cultural differences are recognised
Mason 2007	Specialists involvement in partnering	Survey and interviews	Project	Multi: Client, contractor and sub-contractor	Not specified
Matthews and Rowlinson 1999	Safety management through partnering	Conceptual	Project and strategic	Multi: Stakeholders, including owner, designer, contractor, suppliers, workers	Both: <ul style="list-style-type: none"> <li>- Formal means - selection procedures, charter, conflict resolution policy</li> <li>- Empowerment of workers</li> </ul>
Naoum 2003	The partnering concept	Literature review	Both	Dyad: Client-‘team’	Engineered: Focus on formal means – charter, conflict resolution mechanisms and incentives
Ng et al. 2002	Problem issues of partnering	Case study	Project	Dyad: Client-contractor relationship in focus, even if the importance of ‘all stakeholders’ is recognised	Both: <ul style="list-style-type: none"> <li>- Formal means and partnering tools</li> <li>- Cultural-structural dimensions</li> </ul>
Nyström 2005	Defining partnering	Literature review/ Conceptual	Project	Dyad: Client-contractor	Engineered: Focus on designing components – relationship building activities
Nyström 2008	Evaluating partnering	Quasi-experiment	Project	Dyad: Client-contractor	Not specified
Packham et al. 2003	Partnering in house building	Case study	Project	Dyad: Contractor-sub-contractor	Social aspects: power relationships
Phua and Rowlinson 2004	Culture concept	Survey	Not specified	Multi: Client, contractor, consultant, supplier	Social aspects and identity

Phua 2006	Institutional determinants of partnering	Survey	Not specified	Two or more	Not specified
Pryke 2004	Social network analysis of partnering	Conceptual	Project	Multi: Project coalition	Both: <ul style="list-style-type: none"> <li>- Formal means – contracts and incentives</li> <li>- Social, structural and dynamic aspects</li> </ul>
Pryke 2005	Project governance	Case study	Project	Multi: Project coalition	Both: <ul style="list-style-type: none"> <li>- Formal means – contracts and incentives</li> <li>- Social, structural and dynamic aspects</li> </ul>
Rahman and Kumaraswamy 2004	Implement relational contracting principles	Survey	Project	Multi: Client, consultant, contractor, subcontractor	Both: <ul style="list-style-type: none"> <li>- Formal means – contracts and selection procedures</li> <li>- Cultural and structural aspects, dynamics</li> </ul>
Sarshar et al. 2004	Improve project processes	Case study	Project	Dyad: Client-main-contractor	Both: <ul style="list-style-type: none"> <li>- Systematic improvement model</li> <li>- Cultural-structural aspects</li> </ul>
Shields and West 2003	Emergence of partnering as a “quasi-fixed network”	Case study	Project	Multi: Client, contractor, sub-contractor, supplier	Evolutionary: Cultural-structural aspects
Swan and Khalfan 2007	Mutual objective setting for public projects	Document analysis	Project	Multi: Project team	Engineered: Formal means - workshop
Tang et al. 2006	Partnering mechanisms and CSF	Survey	Project	Dyad: Client-contractor	Engineered: Management techniques
Thompson and Sanders 1998	Partnering continuum	Case study and conceptual	Project and strategic	Dyad: Owner-contractor	Both: <ul style="list-style-type: none"> <li>- Formal means – systematic selection</li> <li>- Cultural-structural aspects</li> </ul>
Wilson et al. 1995	Organisation change for partnering	Conceptual	Project	Not specified	Both: <ul style="list-style-type: none"> <li>- Systematic selection and evaluation</li> <li>- Cultural-structural aspects</li> </ul>
Winch 2000	Institutional reform in construction	Conceptual	Project and strategic (multi-project)	Dyad: Client-consultant/architect and client-contractor	Engineered: Contracts and dispute resolution, even if structural aspect such as site management is considered

Wong and Cheung 2004	Trust factors	Survey	Project and strategic	Dyad: Client/consultant (one group) – contractor (the other group)	Both <ul style="list-style-type: none"> <li>- Formal means – contracts and incentives</li> <li>- Dynamic and experience based</li> </ul>
Wong et al. 2005	Factors and drivers of trust	Survey	Project	Dyad: Client/consultant-contractor	Both: <ul style="list-style-type: none"> <li>- Systematic trust cycle</li> <li>- Dynamic and experience based</li> </ul>
Wood et al. 2002	Partnering ethics	Survey	Project and long term	Two or more: Not specified	Evolutionary: Building of trust based on experiences
Wood and Ellis 2005	Benefits of partnering	Survey	Project	Dyad: Client-contractor/contractor-subcontractor	Evolutionary: Social aspects and change in culture over time in the project
Yeung et al. 2007	Key performance indicators	Literature review/ Survey/ Conceptual	Project	Not specified	Not specified, even if both hard and soft/relationship variables are recognised
Yeung et al. 2008	Measuring partnering performance	Interviews and survey	Project	Not specified (key stakeholders)	Not specified

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Table 1. Summary of main findings from the literature review

<b>Relationship aspect</b>	<b>Findings</b>
Relationship duration	In both the literature and in practice, there is a tendency to focus on <i>project</i> partnering more than strategic partnering, even if the latter is often seen as the goal.
Relationship partners	Neither <i>dyadic</i> nor <i>multi-actor</i> perspectives predominate in the literature. However, not many articles are concerned with joining sub-contractors and suppliers in partnering.
Relationship development	<i>Formal</i> aspects of partnering, such as contracts, tools and techniques, receive a lot of attention. However, many of the articles argue for a mix of formal tools and informal/dynamic/social aspects.

Table 2. Summary of the relationship dimension in SCM and INA in construction

<b>Relationship aspect</b>	<b>SCM</b>	<b>INA</b>
Relationship duration	Establish a chain of close relationships for each project. Less focus on long-term relationships and more on industrialisation and use of standards to assure continuity.	Develop and maintain long-term relationships across projects in order to assure continuity.
Relationship partners	Vertical connections: sub-contractor/contractor/client within projects. Less focus on architects/consultants and connections across projects.	Vertical and horizontal connections among all actors, including architects and consultants. Focus on connections within and across projects (the permanent network).
Relationship development	Formal management techniques to increase chain performance and contracts to maintain organisational boundaries, even if informal aspects are considered important.	The informal and evolutionary nature of relationship development rather than contracts and other formal techniques.

**RELATIONSHIP DEVELOPMENT**

**RELATIONSHIP DURATION**

		<b>RELATIONSHIP DURATION</b>		
		Project	Strategic	Both
<b>Engineered</b>	<b>Engineered</b>	<p><b>MULTI</b> Anvuur and Kumuraswamy 2007, Brown et al. 2001, Chan et al. 2003a, Cheng et al 2001, Conley and Gregory 1999, Eriksson et al. 2007, Fisher 2004, Glogola et al. 2003, Kanji and Wong 1998, Lu and Yan 2007a, Lu and Yan 2007b, Manley et al. 2007, Swan and Khalfan 2007 (13)</p> <p><b>DYAD</b> Bayliss et al. 2004, Chan et al. 2008, Cheung et al. 2003, Eriksson and Laan 2007, Eriksson and Nilsson 2008, Jacobson and Choi 2008, Koraltan and Dikbas 2002, Larson 1995, Larson 1997, Nyström 2005, Tang et al. 2006 (12)</p>	<p><b>MULTI</b> Cheng et al. 2000, Cheng et al. 2004, Kubal 1996 (3)</p> <p><b>DYAD</b> Eom et al. 2008, Fortune and Setiawan 2005 (2)</p>	<p><b>MULTI</b> Cheng and Li 2001, Cheng and Li 2002 (2)</p> <p><b>DYAD</b> Crane et al. 1997, Dainty et al. 2001, Davey et al. 2001, Domberger et al. 1997, Ellison and Miller 1995, Eriksson 2007, Eriksson and Pesämaa 2007, Eriksson et al. 2008, Kadefors et al. 2007, Naoum 2003, Winch 2000 (10)</p>
<b>Social aspects/Evolutionary</b>	<b>Social aspects/Evolutionary</b>	<p><b>MULTI</b> Shields and West 2003</p>	<p><b>DYAD</b> Packham et al. 2003, Wood and Ellis 2005 (2)</p>	<p><b>DYAD</b> Kwan and Ofori 2001</p>
<b>Both</b>	<b>Both</b>	<p><b>MULTI</b> Chan et al. 2003b, Chan et al. 2004, Chen and Chen 2007, Kumaraswamy et al. 2005, Pryke 2004, Pryke 2005, Rahman and Kumaraswamy 2004 (7)</p> <p><b>DYAD</b> Anderson and Polkinghorn 2008, Bresnen and Marshall 2000b, Bresnen and Marshall 2000c, Kadefors 2004, Ng et al. 2002, Sarshar et al 2004, Wong et al. 2005 (7)</p>	<p><b>MULTI</b> Love et al. 2002b</p> <p><b>DYAD</b> Jones and Kaluarachchi 2007, Kaluarachchi and Jones 2007, Love et al. 2002a (3)</p>	<p><b>MULTI</b> Barlow 2000, Matthews and Rowlinson 1999 (2)</p> <p><b>DYAD</b> Beach et al. 2005, Black et al. 2000, Bresnen and Marshall 2000a, Bresnen and Marshall 2002, Bresnen 2007, Humphreys et al. 2003, Li et al. 2000, Thompson and Sanders 1998, Wong and Cheung 2004 (8)</p> <p><b>MULTI/DYAD</b> Lau and Rowlinson 2009</p>

1. Figure 1. Classification of papers<sup>6</sup>

## Endnotes

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<sup>1</sup> Except for Building Research and Information, these are ranked as top three in Wing (1997)

<sup>2</sup> Ranked 6 (ibid.)

<sup>3</sup> Ranked 4 (ibid.)

<sup>4</sup> Some articles published in AACE Transactions were also excluded.

<sup>5</sup> All papers analysed in the literature review are marked with an \*.

<sup>6</sup> 11 articles from the review are not included because they could not be classified due to the lack of adequate information