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Conceptual paper

Copoiesis: Mutual knowledge creation in alliances

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ABSTRACT

Access and utilization of knowledge as in alliances drives firm performance. Prior studies pay heavy attention on knowledge absorption and knowledge transfer among firms, but less on the multifaceted and context dependent construct of mutual knowledge creation among firms in alliances. This study explains the concept of copoiesis as the genuine creation of joint knowledge among firms by referring to the socio-cognitive view and the structuration theory.

Copoiesis: Creación de conocimiento mutuo en alianzas

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RESUMEN

Acceso y utilización de conocimiento en alianzas impulsan el rendimiento de empresas. Estudios previos prestan mayor atención a la absorción y transferencia de conocimiento entre empresas, pero menos al concepto de construcción de conocimiento mutuo entre empresas en alianzas que es multifacético y depende del contexto. Este estudio explica el concepto de copoiesis como creación genuina de conocimiento conjunto entre empresas refiriéndose al punto de vista socio-cognitivo y a la teoría de la estructuración.

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Introduction

Sustained firm performance strongly relies on innovation that is stimulated by the conversion of knowledge through new uses or new combinations of previously disparate ideas, nurturing novel action and solutions (Cohen & Levinthal, 1990). The conversion of knowledge depends on the sharing, integration, use, and leveraging of knowledge within firms and among firms in alliances (e.g. Mowery, Oxely, & Silverman, 1996; Kale & Singh, 2007). Firms in alliances can exchange and combine tangible and intangible knowledge and apply social processes that cover communication, interaction, collaboration, and discourse which create and specify knowledge (Kane & Alavi, 2007). Knowledge transfer and knowledge creation occur within firms but as well among firms and thus in an environment of social interaction, rules, and resources of the firms but also of rules and resources developed within the inter-organizational arena of alliances. The rules strongly influence the couplings, exchanges, and creative processes among firms.

Most existing literature focuses on the access to, transfer of, and absorption of knowledge among allying firms, for example by explicating the absorptive capacities among firms in alliances (Bouncken & Fredrich, 2016 (in press)). Although the absorption of knowledge and learning from the partner can help to extend the (receiving) firms' knowledge base and to enhance its innovation and performance potentials, this configuration of learning does not allow using the full potential of creative solutions of joint work among firms for innovation. Extending the knowledge absorption perspective and drawing upon the organizational learning or organizational knowledge creation perspective, some studies suggest a high importance of mutual knowledge among firms on innovation and performance (Grant & Baden-Fuller, 2004; Holmqvist, 2004; Larsson, Bengtsson, Henriksson, & Sparks, 1998).

Innovations, such as the development of lithium-ion battery for the electric car can improve incrementally and radically by the reciprocal combination and alteration of expertise among firms in alliances in which the partners not only exchange knowledge in one direction — but instead combine expertise, insights, and mutually create new knowledge. Although researchers emphasize processes and gains of mutual knowledge within firms and their benefits on innovation on the firm level, research tends to ignore the mutual-reciprocal-joint knowledge creation among firms (Meier, 2011) and calls for a more detailed understanding about the underlying processes among firms.

The purpose of this paper here is to explain the processes of mutual knowledge creation among firms. We label these processes as copoiesis, which builds on the Greek term of 'poiesis' — creation and co-indicating the joint creation among different entities. The understanding of social creation processes in an arena of interaction among individuals, groups, and firms require a move beyond the traditional economic literature. The socio-cognitive view and the structuration theory can help to entangle the reciprocal creation processes among firms in their context of goals, rules, and ongoing interactions.

From a socio-cognitive standpoint knowledge creation is a process of shifting or combining cognitive structures, which individuals's or group's representations of the world and assumptions how it functions (Carley, 1997; Mathieu, Goodwin, Heffner, Salas, & Cannon-Bowers, 2000). The cognitive models constitute and structure knowledge by the identification of elements that are salient and deliver causal relations in a specific situation (Hargadon & Fanelli, 2002). The socio-cognitive view can explain how individuals process knowledge, but largely leaves out how the rules and resources of a social arena — for instance firms and their systems — influence the creation of and access to knowledge in social entities. Even though cognitive schemes exist within individuals, the social environment influences their development (Beach, 1997), transfers them to a group level. The different environments in firms and the interaction among firms create shared cognitive schemes. Further, knowledge creation across partners and within firms is not random, but directed (Holmqvist, 2004) — yet not fully steerable through rules, organizational structures, and their institutional environment (Giddens, 1984). Structure is both a medium and the outcome of social interactions in societies and thus within and among firms (Giddens, 1984). Thus, this paper contributes to the understanding of mutual knowledge creation among firms and to the integration of the socio-cognitive standpoint and the structuration theory into the alliance research, embedding these theories more closely in the economic literature.

Mutual knowledge creation

Several terms refer to the access and integration of knowledge from one alliance partner to the other: knowledge exchange (Cousins, Lawson, Petersen, & Handfield, 2011), knowledge transfer (Pérez-Nordtvedt, Kedia, Datta, & Rasheed, 2008), knowledge acquisition (Evangelista & Hau, 2009; Inkpen, 2000), learning from partners (Tsang, 1999), and absorptive learning (Jiang & Li, 2009; Bouncken & Kraus, 2013). Yet, this excludes the mutual creation of knowledge, the joint learning among firms as in alliances.

Jiang and Li (2009) describe creative learning within organizations as an iterative, multi-stage process of learning typically in the context of multinational, multiunit enterprises. Goerzen and Beamish (2003) analyze a transformation in which units and individuals in a multinational enterprise or firms of joint ventures apply and leverage knowledge for the creation of new knowledge and capabilities through joint activities. Oxley and Wada (2009) argue that firms in joint ventures engage simultaneously in informal learning behaviour that promotes shared understandings and tacit knowledge flows. Other research is more distinct in acknowledging that individuals and firms can have shared knowledge within alliances (Zollo, Reuer, & Singh, 2002) and that learning can occur mutually (Inkpen & Tsang, 2007) or reciprocally (Lubatkin, Florin, & Lane, 2001) with the alliance partner. Mutual knowledge can consist of a shared understanding about reality, shared routines, rules, or problem solving processes within the alliance (Fang & Zou, 2010; Holmqvist, 1999). Inkpen and Dinur (1998) explain that some of the knowledge associated with the communication, interaction, collaboration, and discourse among firms spirals beyond the group level to the organizational level and the inter-organizational level. For example, individuals and firms can engage in

co-experimentation. Co-experimentation builds upon recursive idea generation and articulation, changes to processes, changed insights and new technological concepts (Lubatkin et al., 2001).

Yet, what are the specifics of mutual knowledge development across firms that have specific targets, rules, and capabilities? This study here argues that different rule systems in firms and different individual and group-level interpretation systems within a social context influence the interaction across different firms and thus the mutual knowledge creation. Giddens' structuration theory (1984) and the cognitive view (e.g., Carley, 1997; Mathieu et al., 2000) can explain this social generation and use of knowledge in more detail.

Structuration theory

Giddens (1984) describes the connection between knowledgeable human actors' activities and the structuring of social systems. Herein Giddens delivers a model on how structures of a social system emerge constrained in a rule-based environment. Giddens' (1984) conceptualization of social structures directs the shared rules and activities of actors related to the individual schemata of cognitive theory, but with a focus on the social level. Structures of a social system are subject to change but also channel change. Giddens' view (1984) evaluates structure as both a medium and the outcome: the "duality" of structure. The duality bridges the view of structures as deterministic, objective, and static with the voluntary, subjective, and dynamic. Social systems have structures, which human agents reproduce across time and space through their actions or change. Structures consist of signification (meaning), domination (power), and legitimation (morality). Structures influence individuals' practical knowledge in processing information and guiding action by interpretative processes, resources, and norms of a particular situation that Giddens (1984) calls modalities. Modalities influence communication, the use of power and control, and choice of behaviours to reinforce or sanction.

Socio-cognitive view

From a socio-cognitive standpoint, knowledge is a process of shifting or combining cognitive structures, which are representations of the world and assumptions about how it functions (Carley, 1997; Mathieu et al., 2000). The cognitive models constitute and structure knowledge by the identification of elements that are salient and deliver causal relations in a specific situation (Hargadon & Fanelli, 2002). Scripts in these models particularize actions for specific situations (Barley, 1986; DiMaggio, 1997; Hargadon & Fanelli, 2002).

To explain team performance researchers suggest that performance in firms improves through shared mental models (Marks, Mathieu, & Zaccaro, 2001; Mathieu et al., 2000). Drazin, Glynn, and Kazanjian (1999) propose that individuals develop meaning about the social context and task issues of a situation enabling them to act and react and to develop compatible creative solutions over time, particularly when individuals come from different professional backgrounds. Shared models can exist in alliances as well. Research on shared team socio-cognitive models (Bowers, Urban, & Morgan, 1995) looks on how individual structures become integrated, coordinated, and partly overlapping among individuals in social systems (typically in teams) and how collective knowledge structures (for firms) emerge (see overview by Mohammed & Dumville, 2001). Shared socio-cognitive models are the common, organized understandings and mental representations of participants that assist them in explaining and predicting the system's (e.g. team's) behaviour and new information encountered within that system (Cannon-Bowers, Salas, & Converse, 1993). Sharedness represents the extent to which the participants' socio-cognitive models are consistent with each other, but not identical (Mathieu, Heffner, Goodwin, Cannon-Bowers, & Salas, 2005).

Socio-cognitive models are not solitary and do not include every detail for interaction. Participants can use multiple socio-cognitive models to conceptualize and process information of the entity, the members, the task, expertise, technology, equipment, and the environment (Cannon-Bowers, Tannenbaum, Salas, & Volpe, 1995; Klimoski & Mohammed, 1994). Mohammed and Dumville (2001) state that socio-cognitive models cover different types of knowledge, specifically, the declarative (what), procedural (how), and strategic (context and application). The alliance context, the directed interaction among the partners and their employees, and the governance mechanisms that steer and coordinate interaction are then relevant to how these socio-cognitive models grow, enter into contact with each other, and can spark mutual knowledge creation.

The socio-cognitive view explains how individuals process knowledge, but largely leaves out how the rules and resources of a social arena influence the creation of and access to knowledge in social entities. Even though cognitive schemata exist within individuals, social environment influences their development (Beach, 1997). Knowledge creation across and within firms then is not random, but directed (Holmqvist, 2004), yet not fully steerable in the rules and structures of organizations and their institutional environment (Giddens, 1984).

Alliances and their structures offer specific channels to share and to change modes of information allowing partners to take advantage of corrective feedback and joint reflection to and making sense of an event or new information (Blickensderfer, Cannon-Bowers, & Salas, 1997). For example, firms and alliances operate under targets, leadership, coordination, information transfers, and guidelines which develop mutual knowledge about goals, behaviour, and orchestration of their interactions (Standifer & Bluedorn, 2006). Knowledge creation is the outcome of social interaction in a context of rules and resources in which each participant abstracts and generalizes not only for personal use but also for intersubjective actions and understandings (Dionysiou & Tsoukas, 2013). The rules and resources of organizations within alliances bind goals, limitations, and experiences that govern activity among firms. Bunderson and Reagans (2011) assume that within and across firms, shared goals, risk taking, experimentation, and knowledge sharing, guide individuals: any subsequent collective learning among individuals is based on anchoring processes and behaviours around goal sharing, risk taking, information, and knowledge exchange.

Copoiesis

The term copoiesis pinpoints the genuine mutual knowledge creation among firms in alliances through interaction of individuals, their collective creativity and reciprocal learning (Bouncken & Teichert, 2013). Copoiesis explains the emergence and joint birth of new knowledge that is new to every participant and based upon a novel transformation of knowledge in and across firms (Bouncken & Teichert, 2013). As a collective activity that co-creates mutually new knowledge for both partners, copoiesis occurs in an environment of social interaction, rules and resources of each firm but also in an environment of rules and resources developed within the inter-organizational arena of alliances including governance mechanisms that influence the couplings, exchanges, and creative processes across the allying firms. Knowledge contains a social component valuable for a mutual process of knowledge creation and shared meaning to be made of that new knowledge (e.g., Kogut & Zander, 1992). Both partners socially construct this knowledge simultaneously and with each other.

From a socio-cognitive view, copoiesis incorporates and generates explicitly, implicitly, or unconsciously mutually shared cognitive schemata among firms. We understand shared as the individual cognitive structures that are "compatible" (Cronin & Weingart, 2007), or "congruent" (Vlaar, Fenema, & Tiwari, 2008). The structures allow consistent interpretations and assessments of information and reciprocal expectations of appropriate behaviour in specific situations (Dionysiou & Tsoukas, 2013). The mutual aspect of copoiesis is rooted in processes of sharing, comparing, interpreting, applying, and changing rules, finally updating beliefs in the inter-firm arena. The process has analogies to the transformation of knowledge within groups of individuals (Brown, Lusch, & Nicholson, 1995; Klimoski & Mohammed, 1994). In this sense, copoiesis entails a recursive interaction process towards shaping new combinations and reconfigurations of knowledge, thereby stimulating creativity, and hence it is a breeding ground for innovativeness (Henderson & Clark, 1990; Khanna, Gulati, & Nohria, 1998; Nelson & Winter, 1985). Individuals interact and partially expose their knowledge and similarities so that differences of their knowledge become visible. In copoiesis, partners cooperatively work within the creation of knowledge by leveraging of such differences and upgrading potential synergies by blending their knowledge about technology, markets, management, systems, and processes together.

From the structuration theory, copoiesis is the outcome of interaction in a context of rules and resources in which each participant abstracts and generalizes not only for personal use but also for intersubjective actions and understandings (Dionysiou & Tsoukas, 2013). The rules and resources of organizations and alliances bind goals, limitations, and experiences. Bunderson and Reagans (2011) assume that individuals are guided by shared goals, risk taking, experimentation, and knowledge sharing and that subsequently collective learning is based on anchoring processes and behaviours of shared goals, risk taking, information, and knowledge exchange.

Copoiesis and performance effects

The created mutual knowledge through copoiesis can increase alliance performance in several ways. Some of the knowledge is specific for the alliance and therefore allows common benefits (Khanna et al., 1998) available to all involved parties enabling them to create commonly advantageous outcomes. Some of the mutually created knowledge allows individually offering subsequent potential for private benefits (Khanna et al., 1998). Copoiesis includes search processes on new combinations of knowledge (Nelson & Winter, 1985) or the reconfiguration of ways how knowledge elements are connected (Henderson & Clark, 1990). Copoiesis can therefore drive forward the use and exchanges of knowledge and its knowledge combination among firms in ways that stimulate innovation.

Copoieis and sensemaking

Copoiesis builds upon ambiguities of the knowledge and the interaction among firms, which have hidden targets, routines, and interpretation schemes. Generally, ambiguity refers to a lack of clarity and causality in reality (Weick, 1995). Ambiguity describes a lack of understanding between causes and effects of the knowledge, as well within the alliance (Simonin, 1999a). In a similar vein, Holmqvist (2003) argues that ambiguity can force inter-organizational conflicts that are a trigger for reviewing past actions critically. Interaction between skilled people in different functional activities and the confrontation with new and ambiguous situations is a breeding ground for developing new insights within the alliance (Berdrow & Lane, 2003). Ambiguity results from sticky information, tacit knowledge, and complexity (Simonin, 1999b). It creates an arena for creating new mental representations through interpretation and joint sensemaking processes (Cheung, Myers, & Mentzer, 2011).

Sensemaking refers to the process through which individuals try to make sense of an event, which is unclear and confusing (Weick, Sutcliffe, & Obstfeld, 2005). The triggering moment for sensemaking processes is ambiguity that emerges from numerous interpretation alternatives of a single situation (Weick, 1995). In alliances, ambiguity can exist concerning the partner, the alliance, or the environment of the alliance. Sensemaking occurs as joint discussions, dialogues, and problem solving processes (Fang, Fang, Chou, Yang, & Tsai, 2011; Selnes & Sallis, 2003) through which alliance partners refine and adapt their mental models and even create new ones (Li, 2006; Selnes & Sallis, 2003). Improved understanding, shared interpretation systems, and mutual knowledge are the sensemaking outcomes in alliances (Cheung et al., 2011). Thus, sensemaking is an important component of copoiesis. However, sensemaking and copoiesis are not the same. Sensemaking delivers a coherent understanding of a situation and in doing this sensemaking can — but does not have to — stimulate mutual knowledge creation in alliances.

Future directions

Although research on learning in alliance is vast, research lacks understanding about the contextual factors of copoiesis.

The competitive overlap between the alliance partners, cultural distance, and the intention to share knowledge might be relevant and interesting directions for future research.

Competitive overlap

The competitive overlap between alliance partners might create both beneficial and dysfunctional effects. Firms with high competitive overlap will be more protective about their knowledge to avoid unintended knowledge flows caused by the partner's opportunistically behaviour (Khanna et al., 1998). Copoieis, however, strongly relies on the openness between the alliance partners. Trustworthy and intensive interaction is a crucial antecedent for mutual knowledge creation in alliances. Beneficial effects of competitive overlap builds upon the idea of absorptive capacity. Competitors' knowledge bases are more likely complementary increasing the ability to understand each other's knowledge base (Meier, 2011). This understanding enables partners to recognize knowledge creation potentials. Thus, the question arises whether competitive overlap supports or impedes copoiesis.

Cultural distance

Scholars mostly highlight cultural distance as a learning hurdle in inter-organizational relationships (Stahl & Tung, 2015). Cultural distance as the degree of differences in cognitions and behaviour between two nations (Kogut & Singh, 1988) is associated with mistrust, personnel tensions, ambiguity, and problems of understanding (Christoffersen, Globerman, & Nielsen, 2013). The empirical results, however, are mixed, showing negative (Evangelista & Hau, 2009; Janowicz-Panjaitan & Noorderhaven, 2008; Lane, Salk, & Lyles, 2001; Simonin, 1999a) or insignificant effects (Cheung et al., 2011; Evangelista & Hau, 2009; Nielsen, 2007; Lyles & Salk, 1996) of cultural distance on learning in alliances. Yet, this research has mostly concentrated on knowledge exchange while neglecting mutual knowledge creation. Thus, the question arises how cultural distance relates to copoiesis.

The lower interaction quality caused by cultural distance will be counterproductive for copoiesis. Stahl and Tung (2015), however, argue that cultural distance can increase knowledge creation processes in alliances. Their argumentation posits that the culture-specific views and perspectives leverage creativity and create new opportunities for knowledge creation. Future studies might shed light on the relationship between cultural distance and copoiesis.

Intention to share knowledge

Empirical evidence shows the importance of effective knowledge sharing on the firm level for innovative performance (Jiang & Li, 2009) and relationship performance (Im & Rai, 2008). Bunderson and Reagans (2011) emphasize the importance of knowledge sharing for mutual and collective learning. The transfer and exchange of knowledge takes place in social interaction processes between individuals. Hence, mutual or collective learning depends on individuals' initial intention to share their knowledge (Bock, Zmud, Kim, & Lee, 2005). Knowledge sharing comprises the disclosure of information and know-how in the process of collaboration (Wang & Noe, 2010). Besides barriers to knowledge sharing (Haas & Hansen, 2007) understanding the mechanisms of knowledge sharing and learning requires insights in the drivers and barriers for knowledge sharing. Bock et al. (2005) show that the willingness to share knowledge relates to subjective norms, organizational climate and the general attitude towards knowledge sharing. Knowing how to influence the intention to share knowledge might help to accelerate knowledge sharing and learning processes.

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