Actor Network Pictures and Networking Activities in Business Networks: An Exploratory Empirical Study

Daniela Corsaro*
Manchester IMP Research Group,
Manchester Business School - The University of Manchester
Booth Street West, Manchester M15 6PB, UK
Daniela.Corsaro@mbs.ac.uk

Carla Ramos
Manchester IMP Research Group
and Faculty of Economics, Universidade do Porto
Rua Dr. Roberto Frias, 4200-464 Porto, Portugal
Carla.Ramos@mbs.ac.uk

Stephan C. Henneberg
Manchester IMP Research Group
Stephan.Henneberg@mbs.ac.uk

Peter Naudé
Manchester IMP Research Group,
Peter.Naude@mbs.ac.uk

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* *Corresponding Author*
 Tel: +44 161 306 161 275 6583, E-mail: Daniela.Corsaro@mbs.ac.uk

Biographical Sketches

Daniela Corsaro is a research fellow at USI (University of Lugano, Switzerland) and visiting post-doctoral research fellow at the *m*IMP Research Group, Manchester Business School (UK). She received her Ph.D. from Catholic University of the Sacred Heart, Milan (Italy), where she is an adjunct professor of Marketing. Her current research interests are in the field of business-to-business networks, especially with reference to value creation and management processes.

Address: Manchester Business School, Booth Street West, Manchester, M15 6PB, UK.
Email: Daniela.Corsaro@mbs.ac.uk

Carla Ramos is a post-doctoral research fellow in marketing jointly at Manchester Business School and at the Faculty of Economics, Universidade do Porto. She joined the *m*IMP Research Group after she finished her PhD at the University of Bath. Her research interests are in the area of business-to-business marketing, network pictures, and business and innovation networks.

Address: Manchester Business School, Booth Street West, Manchester, M15 6PB, UK.
Email: Carla.Ramos@mbs.ac.uk

Stephan C. Henneberg is Professor of Marketing and Strategy at Manchester Business School. He obtained his Ph.D. in Marketing from the University of Cambridge, Judge Business School. His current research interests are in the areas of strategic marketing, relational marketing, consumer behaviour, strategic competences, and social and political marketing.

Address: Manchester Business School, Booth Street West, Manchester, M15 6PB, UK.
Email: stephan.henneberg@mbs.ac.uk

Peter Naudé is Professor of Marketing at Manchester Business School, Manchester University, UK. He gained his Ph.D. in Marketing from the University of Manchester. His research interests are in quantitative modelling and B2B Marketing.

Address: Manchester Business School, Booth Street West, Manchester, M15 6PB, UK.
Email: peter.naude@mbs.ac.uk

Abstract

In recent years, there has been increasing interest among business-to-business marketing scholars in the processes of managerial cognition. In particular, actors' network pictures, defined as the cognitive representations of their business surrounding, have attracted much attention. However, so far there has been little empirical research on the impact that network pictures have on managerial behavior. The purpose of this paper is therefore to understand if and how specific pertinent network pictures characteristics - namely power, dynamics, broadness, and indirectness - are associated with different behavioral choices, i.e. networking strategies. We carried out a study with 445 Executive MBA students (experienced international managers across different industries), to test the association between these characteristics and networking choices. Findings indicate that managers' choices for managing business relationships, i.e. actors' strategic actions, are affected by the way they perceive their surrounding business network. Amongst the different theoretical models of networking options tested, there was one (based on Hoffman, 2007) which showed significant associations with all four tested network picture characteristics. This study has been the first to empirically test the connection between cognition and behavior in business-to-business markets, as well as one of the few to apply an experimental design to study a business-to-business marketing related phenomenon.

Keywords: Business-to-business networks, network pictures, networking, sense-making, experiments.

1. Introduction

The study of managerial cognition, and especially the concept of network pictures, has been a specific focus of recent research in the area of business networks (Henneberg et al., 2009). Amongst business marketing scholars there has been a growing interest in topics such as mental simulations (Vanharanta & Easton, 2009), constructivism and sense making (Harrison & Kjellberg, 2009; Neil et al., 2007; Colville & Pye, 2009), framing effects (Corsaro & Snehota, 2010), cognitive mapping (Bouzdine-Cheemeva et al., 2001), collective mind (Mouzas et al., 2008), cognitive schema (Welch & Wilkinson, 2002), and also network pictures (Henneberg et al., 2006; Ford & Redwood, 2005; Ramos & Ford, 2010; Abrahamsen et al., 2009; Leek & Mason, 2009; Öberg et al., 2007). These different theoretical frameworks have also been combined (Kragh & Andersen, 2009; Geiger & Finch, 2009) in order to provide explanations (on the individual manager level) of business phenomena regarding managerial decisions in complex networks and, more generally, to understand (on the company or business relationship level) the process of network positioning and organizing in business networks. Network pictures have been identified in the literature as business actor's subjective mental representations, or frameworks, of their surroundings. Network pictures are in this way conceptualised as actors' sense-making tools that underlie decision-making in networks (Ford et al., 2002). On the other hand network pictures can also be used as a tool by either researchers or practitioners to grasp actors' understanding of their surrounding business network (Ramos & Ford, 2010; Henneberg et al., 2009).

In recent years, various contributions relating to the construct of network pictures have emerged in the business-to-business marketing literature, e.g. dimensional conceptualizations (Henneberg et al., 2006) or operationalizations (Ramos & Ford, 2010). Looking at a dyadic perspective, Leek and Mason (2009) compared network pictures of individuals from two companies involved in a business relationship, while Ford and Redwood (2005) relate network pictures to the study of

evolution and dynamics in business networks. This idea was followed up by studies on network pictures and their role in the change process of business relationships and network structures (Colville & Pye, 2009; Kragh & Andersen, 2009; Abrahamsen et al., 2009).

However, while these recent conceptual and empirical studies relating to network pictures are evidence of scholarly interest in the topic, the current treatment of the concept remains decoupled from strategic decisions about network position. It has been suggested that network pictures are significant in the process of organizing in business networks, i.e. they generate economic consequences for actors via shaping activities. Such strategic actions in networks are described by Ford et al. (2003) as 'networking' activities. Specifically, the extant literature has not provided details or empirical evidence about the relationship between actors' network pictures and actors' networking strategies within business networks (Henneberg et al., 2009; Ramos, 2008; Welch & Wilkinson, 2002). In the strategy and organizational psychology literature, for instance, the link between managerial cognition and managerial behavior is clearly recognized as being important (Thomas et al., 1993; Goodhew et al., 2005), while it is also accepted that it needs further development (Schneider & Angelmar, 1993; Thomas, 1993). Currently, no such understanding exists regarding the specifics of network cognition and networking strategies. Given this gap in the literature, the particular aim and contribution of this paper is to empirically investigate how aspects of actors' network pictures affect, condition and frame strategic managerial decisions, specifically networking.

For this purpose, we employ Reasoned Action and Planned Behavior Theories (Ajzen & Fishbain, 1980; Ajzen, 1991), Prospect Theory (Kahneman & Tversky, 1979), and Cognitive Sense-Making Theory (Weick, 1995) to devise an experimental design to test the relationship between network pictures and strategic networking. Such experiments are commonly found in business-to-consumer research (Shiv & Fedorikhin, 1999), but rarely in business-to-business

investigations. We utilize a pre-test to generate and test different stimuli related to network pictures, and to the networking strategy choices provided. Based on this, an experiment with 445 experienced managers (Executive MBAs) across industries is carried out. The results from our study improves our understanding of the role that actors' network pictures play in shaping managerial decisions, and subsequent actions. The empirical findings enable us to provide an understanding of how different aspects of managerial sense-making affect strategic action in business networks. Therefore, besides reflecting a theoretical contribution to the literature of the IMP Group on network pictures and networking, the study also provides concrete contributions to managerial practice.

The paper is structured as follows: we initially review the main theories that relate cognition and strategic decision-making, from which we derive some general propositions. The context of the empirical study and its methodology are then discussed, followed by a description of the analysis and the main findings. Lastly, we provide a conclusion and discuss limitations, implications for further research, as well as managerial practice.

2. Managerial Cognition and Strategic Action

Over the past 30 years, cognitive theory has overcome the structure-conduct-performance paradigm (Bain, 1956; Mason, 1957),leading to the search for a new modality to explaining how economic decisions work, putting the single individual at central of the analysis. A variety of traditional economic concepts were interpreted according to this perspective, e.g. such diverse aspects as the product concept (Rosa et al. 1999), the definition of regional clusters (Borroi et al., 1998), and recently even business models have been recognized as cognitive phenomena (Porac et al., 1989). In the strategy literature specifically, we can observe the acknowledged importance

of managerial cognition for decision-making, and even more so under conditions of uncertainty (Hodgkinson et al., 2002).

Thus, cognition and strategic actions are seen as being strictly interrelated. Nevertheless, research aimed at understanding how certain representations of business reality affect managerial action is still in its infancy.

2.1. Underlying Theories on Cognition and Strategic Action

In order to understand managers' behavior, it is fruitful to refer to some theories in social psychology that have attempted to explain human behaviors. We refer particularly to the Theory of Reasoned Action, the Theory of Planned Behavior, and Prospect Theory. This is followed by a brief analysis of Organizational Sense-Making Theory, which aims at understanding human behavior in a managerial setting.

The Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein, 1980; Fishbein & Ajzen, 1975) has been used to predict and understand individual behavior in a social context. According to TRA, an individual's intention to perform is the most important and immediate predictor of future behavior. Intention, which indicates the amount of time and effort that a person is willing to dedicate for an action to be undertaken, is in turn determined by two psychological variables: attitudes and subjective norms. Attitudes represent a person's overall evaluation of what it would be like to perform a particular behaviour, while subjective norms are the perceptions of social pressure to perform, or not perform, a particular behavior. TRA has been criticized for its reliance on intentions to effectively predict behaviors, and for the fact that other important cognitive predictors of intentions/behaviors, such as desires, anticipated regret, self identity, moral norms and social relations are ignored (Langdridge et al., 2007).

In 1991, Ajzen accepted the critique that TRA is only able to predict voluntary behaviors over which individuals exert a high degree of control. Therefore, he added an additional construct, namely perceived behavioral control, giving rise to the Theory of Planned Behavior (TPB). Perceived behavioral control can be defined as the individual's perception of control over the behavior, i.e. the obstacles that one encountered in past behavioral performances.

In addition to TRA and TPB, another framework that contributed to explain human behavior is Prospect Theory (Kahneman & Tversky, 1979). Prospect Theory (PT) originated from a profound critique of the utility concept of economic behaviour, according to which individuals make choices in order to maximize their subjective expected utility (Friedman & Savage, 1948). The claim is that people actually undertake decisions that are inconsistent, not Pareto efficient, or are based on normatively irrelevant factors (Bazerman, 1998). More specifically, PT scholars observe that risk attitudes and behaviors are not just determined by the expected returns of a decision, but rather they are also anchored by some predetermined reference points in the mind of the decision maker. These reference points or 'frames' violate the concept of rationality posited in economic theory (Kahneman, 2003). It follows that decisions under risk are influenced by two main effects: the first is that people tend to underestimate probable outcomes compared to those that are certain (certainty effect), and the second is that people can show inconsistent preferences when the same choice is presented in different forms (isolation effect).

These three theories have often been applied to managerial and organizational contexts. For instance PT has been used in order to understand why organizations facing similar events respond in different ways (George et al. 2006), and TRA was used to study senior managers' behavior in promoting the strategic role of IT in reengineering events (Wu, 2003). Nevertheless, whilst the importance of individual cognitive structures is well established, the nature and function of these structures in organizational settings is still under researched (Walsh, 1995). Managerial cognition

could be considered as a mediator of the relationship between environmental events and organizational actions (Daft & Weick, 1984; Hambrick & Mason, 1984). In particular cognitive sense-making processes are critical for strategic decision-making as they represent reference points and suggest possible outcomes (Fiol, 1994; Fiss & Zajac, 2006).

Cognitive sense-making can be defined as a process involving the ongoing retrospective development of plausible images that rationalize what people are doing, i.e. what is going on (Weick et al., 2005). Through enactment processes, individuals socially construct key aspects of the material worlds (Weick, 1969; 1995). Sense-making is thus the process through which individuals try to find logic for their working environment (Weick, 1969). It involves the construction of frameworks and mental representations which help the individual to guide actions and decisions (Meindl et al. 1994). These frameworks are also known as 'cognitive structures' (Johanson & Mattsson, 1987) or 'frames of reference' (Cantril, 1941) and consist of ideas, outlooks, assumptions, expectations and decision rules.

Cognition is closely connected to information processing: mental maps help individuals to select the information they process, and to make sense of this information, by the activities of scanning, interpreting and acting (Daft & Weick, 1984; Gioia & Chittipedddi, 1991). Recently, it has been shown that managers' frames do not represent only tools for ex-post justification, but rather they are also ex-ante part of the process of decision-making (Kaplan, 2008). The main argument that supports this proposition is that actors search to push strategic options during decision-making processes in the direction of their own cognitive frames.

From these theories on cognition and strategic action, we can derive that subjective representations of the environment provide a way for viewing current events and activities and make strategic decisions: "*Top managers develop subjective representations of the environment that, in turn, drive their strategic decisions and subsequent firm action*" (Nadkarni

& Barr, 2008, p. 1395). Organizations respond differently to situations in the environment as a consequence of their managers or decision-makers holding different cognitive structures, and thus interpreting strategic issues in different ways (Dutton & Jackson, 1987).

2.2. Network Pictures and Networking

The critical role of cognition for managerial decision-making processes has also been established within the Industrial Marketing and Purchasing (IMP) Group. The departure point for IMP scholars is that, if cognitive representations provide the foundation for organizational activities (Meindl et al., 1994), then network pictures form the basis for individual managers' understanding of their surrounding business network, and consequently for their strategic action of networking (Ford et al, 2003). From a cognitive perspective, adopting the concept of network pictures implies that decision makers act and react based on their mental models.

The relationship between network pictures on the one hand, and managerial action, particularly networking on the other hand, has so far been only posited theoretically without any empirical research testing the association between the two concepts. Within the model of managing in networks, Ford et al. (2003) state that network pictures are closely interconnected both to networking activities (e.g. strategic managerial actions in business networks), and network outcomes (e.g. the results of strategic actions in business networks). Network pictures affect what each actor can or might wish to do (Ford et al., 2003), and they can be affected by what is happening within the network. Thus, network pictures in turn are formed through interactions, i.e. through networking with other companies (Ford et al., 2003). In a similar way Håkansson et al. (2009) propose three broad aspects involved in acting: the cognitive representation of the context (perceptions), the actual acts (behaviours), and the intended and expected outcomes. These three

variables are all interrelated. Network pictures are assumed to underlie intended outcomes and thus to translate into particular behaviors that achieve these outcomes.

In this paper we focus particularly on one part of this triadic relationship, i.e. the one between network pictures and mangers' networking strategies. Exploring this link is highly relevant for the IMP tradition (Ramos & Ford, 2010; Henneberg, et al. 2006). In particular, we are interested in the associations between pertinent network picture characteristics and different networking strategies. The aim is to explore in detail if, how, and why diversity in network pictures can affect the decisions taken with regards to the management of business relationships. To frame this purpose, some general propositions are derived.

3. Propositions on the Relationship between Network Pictures and Networking

In this section, we develop four propositions regarding the association between specific pertinent characteristics of individual network pictures and different models of networking, i.e. strategic actions. We begin by identifying and exploring four dimensions of network pictures which are particularly relevant for framing actors' networking options. This is followed by a description of three networking models which can be found in the extant literature.

3.1. Pertinent Network Picture Dimensions

Drawing on the network pictures operationalisation carried out by Henneberg et al. (2006) and by Ramos and Ford (2010), we identified four dimensions of network pictures with specific pertinence for framing actors' strategic networking options. In these two papers, some of the dimensions have been explicitly discussed whilst other were only implicitly included to.

3.1.1. Power

Power is identified in Henneberg et al.'s (2006) model of network pictures; this dimension also corresponds to what Ramos and Ford (2010) classified as Focus on Actors. Henneberg et al. (2006) discuss power in terms of actors' perceived dependence or independence in relation to other actors within the network of relationships (Emerson, 1962; Hakansson and Gadde, 1992; Hingley, 2005), as well as in terms of strength of the relationships, e.g. some combination of strength of ties (Granovetter, 1973), and strength of commitment (Ganesan, 1994). Power can be associated with centrality, i.e., with the extent to which an actor perceives themselves to be at the network's centre. One of the IMP Group's underlying axioms is that no company owns a network, thus it is not possible to define a centre or *hub* for the business network (Ford et al., 2002).

3.1.2. Dynamics

Dynamics corresponds to what Henneberg et al. (2006) identify as Time/Task, which Ramos and Ford (2010) classify as Stasis. Dynamics is about the time horizon that is involved in the network (Ganesan, 1994), and actors may perceive this as being more or less relevant (Boyd & Fulk, 1996). Actors are embedded in a network of relationships made up by a series of episodes, involving exchange and adaptation processes between the parties along varying stages of relational developments (Ford, 1980; Hakansson, 1992; Johanson & Mattsson, 1987). Each interaction that takes place within a relationship is thus merely one episode of the overall relationship (Ford, 1980; Ravald & Gronroos, 1990). Relationship continuity is frequently considered a fundamental pre-condition for exchange and development (Hakansson & Snehota, 1995) and it reflects the relationship's dynamic nature. There are nevertheless some situations of discontinuity, e.g. in interimistic business relationships, which are considered relationships

(Lambe et al., 2000). The network in which such relationships are taking place is itself dynamic; reflecting the interconnected character of the underlying relationships, which in turn affects companies' strategizing decisions (Hakansson & Johanson, 1992).

3.1.3. Broadness

Broadness is one of the dimensions included in Ramos and Ford's (2010) model of network pictures. It is defined in terms of perceived network "*wideness*" (i.e. diversity of the nature of the actors included) and "*scope*" (i.e. number of direct and indirect relationships and actors). Henneberg et al.'s (2006) model uses the dimension Boundaries, which is closely related to the concept of broadness: boundaries define 'how far the perceived network goes' (i.e. the network horizon; Anderson et al., 1994; Holmen & Pedersen, 2003). Given the feature of interconnectedness (Axelsson, 1992), the business network does not have any *real* boundaries (Ford et al., 2002; Holmen & Pedersen, 2003). However, due to actors' limited cognitive capacity (Weick, 1979), as well as issues around uncertainties (Ford et al., 2002; Henneberg et al., 2006), and an incomplete understanding of some network relationships and connections (Anderson et al., 1994), actors "bracket" (Weick, 1995) or "frame" (Callon, 1997) what they choose to see in their surroundings. Only a restricted number of actors and interactions can be identified and acted upon by individuals (Salmi et al, 2001; Henders, 1992). There are different perspectives on how broad an actors' view of the business network should be. Gadde et al. (2003) claim that when strategizing, companies ought to have a broad view of the surrounding network. This principle draws on the idea that actors need to "*identify, read, and interpret moves or changes in the network, in order to direct the conduct of a company*" (Holmen & Pederson, 2003, p. 412), as well as to be able to understand different perspectives of the network; companies ought to have a "*broader horizon when it comes to monitoring the behavior of other actors*" (Hakansson &

Snehota, 1989, p. 282). A different perspective is put forward by Wilkinson and Young (2002), who argue that companies are not always advised to hold a broad view. Some actors have a narrow view and are successful, whilst others need to have a broader perspective to guarantee their viability (Wilkinson and Young, 2002). However, as only a restricted set of opportunities and constraints can be identified and acted upon, actors may incur risks when trying to consider every single effect that their actions may have over others (Wilkinson and Young, 2002). Therefore, holding a broad view does not guarantee that actors have the 'right' network insights or that they can achieve the desired network outcomes (Ford et al. 2003, Mouzas et al., 2008). Managers commonly think merely about those companies or actors that they consider relevant for their business activity (Anderson et al., 1994; Ford et al., 2002; Holmen & Pederson, 2001). Anderson et al. (1994) argue that often actors have a restricted view of the world "*due not only to the network extending further from the actor but also to the basic invisibility of network relationships and connections*". Holmen and Pedersen. (2001; 2003) show that companies are sometimes "*myopic*" as a result of the limited amount of resources they have available (including managers' cognitive capacity). These scarce resources have therefore to be well-managed, forcing companies to select what are the relationships that have to be dealt in more detail.

3.1.4 Indirectness

Indirectness is related to the dimension of Broadness identified by Ramos and Ford (2010) and Boundaries (Henneberg et al. 2006). However, in both models the dimension Indirectness was not treated in an explicit way. Therefore, we define Indirectness as the ratio of the number of indirect relationships that an actor has to the number of direct ones. Easton (1992) defines indirect relationships as those "*between two firms which are not directly related but which is mediated by a third firm with which they both have relationships*" (p. 15). Indirect relationships can be vertical

(i.e. focal firm with customer's customer) or horizontal (firm with competitor via common customer) (Mattsson, 1986; Easton, 1992). Indirect relationships are an important aspect of actors' strategizing options, given that they can, and usually do, represent an important source of access to resources (Easton & Araújo, 1992); they are an *"alternative and additional route by which two network actors may be linked"* (p. 70). Relationships of this nature are a critical element of a company's identity, and consequently its attractiveness to business partners (Anderson, et al., 1994). An actor may choose to interact with a specific counterpart in a certain way as a result of being aware of the contacts and relationships that that counterpart has; therefore the direct relationships may reflect an opportunity to *"reach and influence others in an indirect way"* (Hakansson, 1992). Indirect relationships are therefore the context for direct relationships (Mattsson, 1986).

3.2. Networking Models

Different ways to analyze strategic networking options (i.e. the strategic actions about how actors may manage in business relationships with others in the network) have been proposed in the marketing and strategy literature. We selected three approaches, representing the variety of different concepts addressing issues of networking. These are strategic alliances, business networks (IMP), and relational exchange. The combination of these different perspectives can provide rich insights as well as an opportunity to compare these models empirically. A parsimonious discussion on the three selected models is provided below.

3.2.1. Networking as Strategies for Managing a Portfolio of Alliances

Hoffman (2007) identifies three strategies for managing a portfolio of alliances, each being associated with two contingency factors: environmental uncertainty, and the firm's potential for shaping the environment or its resource endowment. Different resulting strategies are identified
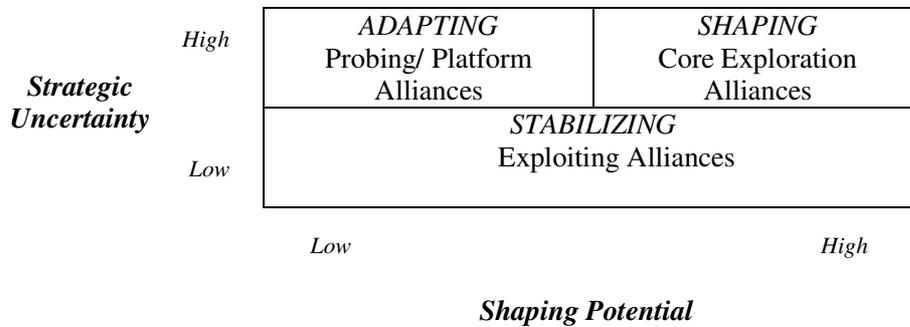
based on these two dimensions. As part of *exploration*, the actor gets access to new resources by joining new alliances, exploring or opening-up new development possibilities or opportunities. This networking mode is related to two different strategies: adapting and shaping. Adapting characterizes an actor reacting to a dynamic environment, thus increasing an actor's resource base, as well as its strategic flexibility. This is achieved by exploring new development opportunities without making high and irreversible investments. An adapting strategy implies broadening the firm's resource endowment, as well improving its capacity to learn and change. A shaping strategy implies actors actively influencing environmental dynamics according to their own strategy. Such a strategy reflects a will to develop new resources and capabilities by exploring new development opportunities. It implies expanding and deepening the firm's resource endowment in a focused way.

On the other hand, with *exploitation,* the actor exploits the current resources by fully acquiring and integrating the cooperation unit or by making joint successive investments with its current partner. This category is associated with a stabilizing strategy, i.e. the actor solidifies the environment with the aim of avoiding organizational change. This strategy implies exploiting the resources that the firm has previously gained through exploration (i.e. adapting and shaping strategies) and thus deepening and exploiting an established competitive advantage in an efficient and sustained manner.

The three main strategies (adapting, shaping, and stabilizing, see figure 1) are posited to allow firms to deal with an ever changing environment (Ansoff, 1965; Wernerfelt & Karnani, 1987). Adapting and shaping are about exploration of new opportunities with the aim of acquiring new resources and capabilities. On the other hand, stabilizing is about efficiently exploiting the existing resources in order to defend the built-up competitive advantage (March 1991).

Figure 1

Types of Alliances Strategies.

		ADAPTING Probing/ Platform Alliances	SHAPING Core Exploration Alliances
Strategic Uncertainty	*High*		
	Low	STABILIZING Exploiting Alliances	

          Low   *High*

Shaping Potential

Source: Hoffmann (2007), p. 832.

3.2.2. Networking in Business Networks

Networking as part of the interaction model of the IMP includes all activities related to an organization's management of its existing relationships in order to manage its position within the network, and specifically to the underlying strategies of how to network (Håkansson & Ford, 2002; Ford et al., 2002). Thus, networking is related to the substance of interactions as well as the managerial decisions on how to interact with counterparts as part of a strategy. The model of networking proposed by Ford et al. (2002) encompasses three levels: on a first level, i.e. the management of the existing relationships, two antagonistic behaviors ares posited: to confront or to conform. When managing existing relationships on a day-to-day basis, actors may choose to *confront* (seeking specific change within existing relationships) or to *conform* to (keeping the status quo in specific aspects of the existing relationships) business partners' requirements (Håkansson & Ford, 2002; Ford et al., 2002). Decisions of this nature are taken every day, in every interaction, and they are always dependent on the counterparts' action and reactions. Although these networking alternatives may appear to encompass minor changes, in the long run they may lead to more radical changes and thus may affect companies' strategic development.

On a second level Ford et al. (2002) propose two alternative networking options for managing the position of a company in the network: to consolidate or to create. An actor may choose to maintain its current positioning, or may choose to change that positioning. If the actor chooses to maintain it, they may either try to improve daily operations within existing relationships or may use new relationships to *consolidate* the position. New relationships will include counterparts that offer resource ties similar to existing ones. If on the other hand, the actor chooses to change the current positioning, they may also either use the existing relationships by combining them in new ways so that the content of those relationships are to some extent altered, or they may *create* new ones, reflecting different resource ties and resulting in a new positioning.

The third level proposed for networking, comprises strategies on *how* to network as intentional behavior. An actor may choose either to *coerce* other actors or to *concede* to them. Actors coerce by directing specific aspects of the interaction in accordance with their own interest, and concede by following the intent of others. Such decisions raise issues regarding the control of the network. If the actor decides to attempt to control the surrounding network and thus to coerce them, he or she will be missing out on the opportunity of benefiting from the network's resources, and may end up with an even more self-centered view of the network. Those who are coerced into doing something by other actors will not be willing to contribute to the relations with such an imposing actor and consequently the latter will miss out on opportunities. On the other hand, by deciding to concede, the actor embraces other actors' resources and knowledge and may thus benefit from the network.

3.2.3. Networking as Relationship Management Modes

Krapfel et al. (1991) use relational theories to derive a matrix with six forms of relationship management modes. The different modes of managing existing relationships depend upon the
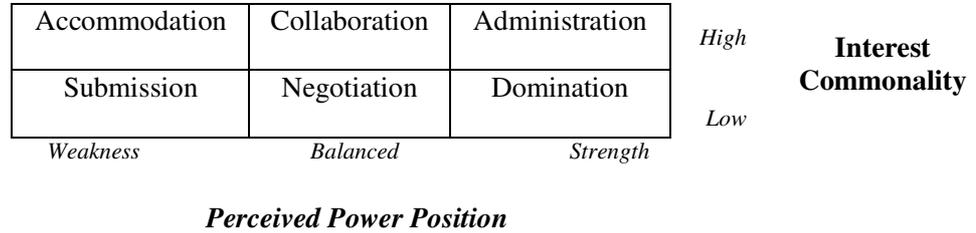
actors' perception of differential power and dependence relationships between partners, and the level of interest commonality (mutuality) in relation to their counterparts. The resulting relationship management modes can be distinguished from each other according to differences in communication openness and information sharing behavior between the firms. "*The amount, accuracy, timeliness and relevance of shared information*" (p. 28) creates value for counterparts and reflects the actor's future intentions with regards to these counterparts. Different information sharing strategies can therefore be associated with each relationship management mode (see figure 2).

The first strategy of *collaboration* relates to high levels of mutuality between the actors, as well as a balanced power situation. In this case, the firm is willing to have an open communication strategy, characterized by high density information sharing. *Negotiation* happens in situations of low mutuality between the actors, combined with a balanced power situation. In this case, the firm is only willing to share information to the extent that it is necessary to reach a deal as part of the negotiation. Therefore, no sensitive information is shared, and because none of the involved parties has enough power to demand information from the other, communication is formal and unpretentious. An *administration* situation is characterized by a focal actor having high power over the counterpart, as well as perceived high mutuality. In these cases, through promises of mutual benefits, the firm may convince its counterpart to provide it with information. Communication flows can therefore be characterized as uni-directional, purposeful and well-timed, but not very open. *Domination* exists when an actor has a strong perceived power position in relation to the counterpart, and there exists low interest commonality between them. Such a situation is associated with the use of power to acquire information from counterparts, mostly on the basis of threats. Perceptions of low mutuality and low power over the actor's counterparts cause *accommodation*. In this case, information will be exchanged to the extent that it shows

willingness to cooperate; thus, there is an exchange of useful, non-sensitive information. *Submission* happens as a consequence of a weak perceived power and a low interest commonality between the actor and its counterpart. As such, there is not much willingness to share information, or to show willingness to collaborate with the counterpart, and as such only limited information is shared.

Figure 2

Relationship Management Modes

Accommodation	Collaboration	Administration	*High*	**Interest Commonality**
Submission	Negotiation	Domination	*Low*	

Weakness *Balanced* *Strength*

Perceived Power Position

3.3. Proposition Development: Association between Network Pictures and Networking

Managers' cognitive frames are believed to condition and guide their behavior (Weick, 1995), something which reflects the relationship between network pictures and networking (Ford et al., 2003). Consequently, based on these general sense-making frameworks, this research is based on the general proposition that the pertinent features of network actors' cognitive schemata are associated with specific strategic decisions about managing business relationships. Thus, the four network picture characteristics explored above are expected to frame certain strategic behavioral responses as described in the three different networking models. Specifically, we derive four propositions, each associated with a different network picture characteristic vis-à-vis the three considered networking models.

Proposition 1: *There exists an association between the actor's level of perceived power in the business network and that actor's networking decisions.*

Drawing on the description of power above, we posit that this network picture characteristic conditions actors' predisposition to actively mark out the course of the business relationships they are involved in, as well as of the business network in which they operate. Thus, the willingness to

change is reflected mainly in actors' choices between exploring (changing) or exploiting (not changing) alliances (Hoffman, 2007). Additionally, actors' desire to define the development of relationships and the network can be argued to be closely associated with their shaping potential, and thus with their networking decision on adapting or shaping. For example, if an actor perceives himself as powerful, he can be expected to undertake a shaping strategy. As for networking in business models (Ford et al, 2002), the predisposition to actively mark out the course of the business relationships they are involved in conditions actors' strategies on how to network. It also conditions their choice on how to manage business relationships and how to manage their position within the network. This way, powerful actors may be expected to choose more often to confront within existing relationship, to create a new position and to coerce business partners. Finally, in terms of relationship management modes (Krapfel et al, 1991), an actors' willingness to develop relationships and to change situations is associated with their willingness to share information with counterparts. This way, an actor who perceives himself as powerful can be expected not to be willing to share information, instead trying to get unilateral information from counterparts, achieved by either domination or administration.

Proposition 2: *There exists an association between the actor's level of perceived dynamics in the surrounding business network and that actor's networking decisions.*

The network picture characteristic of dynamics (i.e. perceived relationship time horizon) is closely associated with actors' perception of uncertainty within a business network (Hough and White, 2004), with perceived uncertainty priming actors' networking decisions. According to information processing theories (Gioia & Chittipedddi, 1991), uncertainty leads to more intensive scanning to get additional information (Hough & White, 2004), thereby identifying strategic issues and possible actions (Dutton & Jackson, 1987). Moreover, the more information actors

have on cause-effect relations, the more they will perceive themselves as being able to control causes (Thompson, 1967; Thomas et al., 1993). In this way Actors are more able to cope with ambiguity and uncertainty, and to place greater focus on the positive aspects of particular issues (Thomas & McDaniel, 1990; Staw et al, 1981; Walsh, 1988). In summary, a dynamic view of the network leads to greater pro-activity and willingness to implement change. Therefore, the extent of dynamism of actors' views of their surroundings conditions the level of strategic uncertainty, and thus frames the choice between exploring (high uncertainly) and exploiting (low uncertinty) (Hoffman, 2007). Moreover, dynamism also determines actors' willingness to pro-actively implement change. For example, an actor perceiving high dynamism in the network may be expected to choose a shaping strategy when managing business relationships. Similarly, when relating dynamics of network pictures to the networking options of Ford et al. (2002), we would expect that an actor perceiving the network as dynamic would be more hands-on and inventive, thus choosing to confront, create, and coerce. In terms of relationship management modes (Krapfel et al, 1991), actors have different levels of need for scanning information as a result of varying environmental uncertainty. An actor who perceives the network as dynamic, needs to get access to information so as to decrease the level of uncertainty. That actor may therefore be expected to be willing to adopt an open communication strategy with counterparts, with high levels of information sharing, or else to share information only to the extent that it allows the actor to get the information required. This approach is associated with collaboration or negotiation strategies.

Proposition 3: *There exists an association between the actor's level of perceived broadness of the surrounding business network and that actor's networking decisions.*

Broadness defined as depth, width or scope of network pictures is associated with actors' perceived access to resources within the network. Applying this principle to Hoffman's (2007) model for managing a portfolio of alliances, actors' perceived ability to manage relationships and possibility to get resources from other actors, is closely associated with their shaping potential (i.e. resource endowment). We can expect that an actor holding a broad view of the network is exposed to greater strategic uncertainty as a consequence of perceiving a more complex environment. This results in the expected adoption of a shaping strategy. However, regarding the network options outlined by Ford et al. (2002), broadness implies dealing with a considerable amount of diverse relational interactions, allocating fewer resources to managing each situation. The actors can therefore be expected to undertake a less pro-active approach, choosing to conform, consolidate and concede as part of their networking decisions. Finally, broadness can also be related to Krapfel et al.'s (1991) relationship management modes. The levels of underlying uncertainty influence the need for scanning information, and the underlying levels of power determine the strategies that can be put into practice to get access to information. As such, an actor who holds a broad view may be expected to choose an administration or domination strategy, forcing other actors to provide the required information.

Proposition 4: *There exists an association between the actor's level of perceived indirectness of the surrounding business network and that actor's networking decisions.*

Indirectness reflects actors' perceived accessibility to other actors' resources, namely to those with whom relationships are mediated by other actors. Thus, a similar logic to the one underlying the proposition regarding the relationship between broadness and actors' networking choices can

be applied to the network picture characteristic of indirectness. Taking Hoffmann's (2007) model, different levels of perceived access to other actors' resources results in diverse shaping potentials; moreover, the number of actors and relationships an actor has to deal with influences the strategic uncertainty. Thus, an actor who perceives a high level of network indirectness is expected to adopt a shaping strategy. As for Ford et al.'s (2002) model of networking in business systems, indirect relationships are managed through direct relationships. The actors who mediate indirect relationships play a crucial role in determining access to third parties' resources. The actor may therefore be expected to adopt a relationship management style which reflects a leading position, trying to control such relationships. This way, an actor who perceives a high level of indirectness is expected to confront, create and coerce its direct counterparts. Furthermore, regarding Krapfel et al.'s (1991) relationship management modes, the level of perceived indirectness determines the extent of environmental complexity and therefore uncertainty, as well as the level of perceived power. As such, an actor who perceives a high level of indirectness is expected to adopt an administration or domination strategy, which results from the underlying high level of uncertainty and power.

4. Methodology and Research Design

To test the propositions which posit an association between pertinent characteristics of network pictures on the one hand, and options for strategic networking behavior on the other, a quantitative experimental study was conducted. Experiments were chosen due to the exploratory nature of our research objective. Furthermore, this method is commonly used in psychology and in consumer marketing to analyze the interplay between attitudes and behavior, but has not been used frequently in business marketing (Shiv & Fedorikhin, 1999) due to problems of data access

and concept operationalization. The experiment was conducted in two stages: a pre-test was used to test concepts operationalization, while a large-scale experiment tested the propositions.

4.1. *Stage 1: Pre-test for Concept Operationalization*

We conducted a pre-test with the aim of developing the experimental scenarios and to test the effectiveness of the stimulus manipulation, i.e. network picture characteristics (Hoyle et al., 2002). The pre-test was carried out two weeks before the main experiment. Eighty-five experienced managers (in most cases board-level directors or CEOs across all industries) who took an Executive MBA at a major English university were used for the pre-test. Each network picture characteristic was manipulated by providing bi-polar stimuli, i.e. high power *versus* low power, dynamic *versus* static, broad *versus* narrow, and high indirectness *versus* low indirectness. The stimuli were based on a pictorial as well as textual description of a network picture (Henneberg et al., 2009) and were developed independently (and then integrated) by three experienced researchers in the area of cognitive maps (see Appendix 1 for the network pictures used). Each stimulus was intended to provide a very high/low expression of one of the network picture characteristics, while the other characteristics were only moderately expressed. Altogether the design encompassed eight network picture stimuli, two for each characteristic. As part of the pre-test each respondent was exposed to stimuli corresponding to all different pertinent network picture characteristics. Respondents were asked to envision being employed by a company called 'focal firm' which was also identified in the visual stimuli and in the textual scenario description. Respondents were asked to consider the scenario and to identify, on a 1 to 7 scale, how strongly they rated this scenario regarding the pertinent network picture characteristics (see Appendix 2). For example, respondents were shown a network picture which was intended to portray high power, thus, the respondent was expected to score high on the description "*This scenario*

represents the focal firm as being in a <u>powerful position</u>", and to score all other stimuli low or medium on the power characteristic. To test whether our network picture manipulations were successful, we also asked whether each stimulus represented the opposite, i.e. for the above high power situation we also ask "*This scenario represents the focal firm as being in a <u>not very powerful position</u>*". We then calculated the differences in scores between these two questions for each stimulus to check if the manipulation discriminated. On a 7 point scale, the differences are 3.54, 2.90, and 3.76 for power, dynamics, and broadness, showing good discriminant power of the stimuli. However, for indirectness the difference was merely 1.29. Therefore, results for this network picture characteristic must be interpreted with some care.

Some mitigation strategies were implemented in order to avoid biases. It is known that the same information presented in different forms can lead to different decisions, as framing effects arise and biases in choice behaviors can occur (Kahnemann & Tvesky, 1979). To avoid these effects, we first included two different pictorial representations for each network picture characteristic: a normal version and an inverted one (where the representation was mirrored); respondents were randomly assigned one of the two. Secondly, in order to prevent individuals from being biased by the sequence of the materials they were provided, we changed the stimuli order in a random way.

For networking strategies, the dependent construct, the operationalization was developed with the help of twenty experts in business marketing and five managers. These participants were asked to judge the clarity of each statement describing the networking strategy in terms of a self-typing paragraph. Several adjustments were made to the initial drafts, and the resulting self-typing descriptions for each networking model are presented in Table 1. As part of the expert discussions, it was decided to include a 'neither' option for each of the three networking choices discussed by Ford et al. (2002) as the theory does not posit each choice as a necessary for all relational situations.

27

Table 1 Networking strategies options

1. Hoffman (2007)	1. The focal firm commonly adapts, in a reactive way, to its business surroundings. It frequently creates new relationships. New relationships aim at broadening the focal firm's resource availability. For example, very often establishes new partnerships with other firms to deal with changing customer needs.
	2. The focal firm commonly shapes, in a pro-active way, its surroundings. It frequently creates new relationships. New relationships aim at consolidating the focal firm's resource availability. For example, the focal firm frequently works with new partners to create new product lines aimed at generating new business opportunities.
	3. The focal firm commonly consolidates already existing business relationships. It does not frequently create new relationships. The exploration of existing relationships aims at further strengthening its established competitive advantage. For example the focal firm frequently invests in the development of long-term supply contracts with existing suppliers.
2. Ford et al. (2003)	1. The focal firm frequently implements change within existing business relationships. For example, this could mean unilaterally modifying its current policy of stock levels for a specific raw material, this way changing the pattern of interaction with its suppliers.
	2. The focal firm frequently does not implement change within existing business relationships. For example, this could mean keeping the established policy of prices for a specific material, thus maintaining the pattern of interaction with its suppliers.
	3. Neither of these two ways of managing business relationships is applicable or relevant for the focal firm's situation.
3. Ford et al. (2003)	1. The focal firm frequently aims at consolidating its existing position in the market. For example, the focal firm has decided to tailor its offering to the requirements of particular customer, therefore specializing its activities within existing relationships.
	2. The focal firm frequently aims at creating a new position in the market. For example, the focal firm decided to invest in the development of a new technology, which will lead to the establishment of relationships with new clients and new suppliers.
	3. Neither of these two ways of managing business relationships is applicable or relevant for the focal firm's situation.
4. Ford et al. (2003)	1. The focal firm directs the interactions with its business partners, by controlling their resources and activities in accordance with its own interest. For example, the focal firm exercises control over a small number of large suppliers that works to our designs and mandated procedures.
	2. The focal firm follows the intents of others in existing interactions, by embracing their resources and knowledge. For example, the focal firm produces a product to a customer's own design.
	3. Neither of these two ways of managing business relationships is applicable or relevant for the focal firm's situation.
5. Krapfel et al. (1991)	1. The focal firm frequently depends on its business partners, with which it shares common interests. As such, it provides information to those business partners only to the extent that it is required to show willingness to cooperate.
	2. The focal firm depends on its business partners, with which it does not share any common interests. It does not show much willingness to share information with its business partners, except when it is forced to do it.
	3. The focal firm has a balanced power relationship with its business partners, with whom it shares interests. It is willing to have an open communication policy, and therefore there is an intensive sharing of information with other parties.
	4. The focal firm has a balanced power relationship with its business partners, with whom it does not share interests. There is not much willingness to share information, besides those that are necessary to negotiate deals.
	5. The focal firm has a position of power over its business partners, with whom it shares common interests. The focal firm persuades others to provide it with information, based on the promises of mutual payback. Information flows are relatively limited and uni-directional.
	6. The focal firm has a position of power over its business partners, with whom it does not share any common interests. The focal firm persuades others to provide it with information, based on threats.

To increase the validity of the experimental design, the pre-test results were analyzed and discussed by the researchers as well three experts from social psychology, experimental design and research in managerial cognition. Results from the pre-test showed that one network picture characteristic had to be eliminated from the research as it did not discriminate: stereotyping (in terms of presenting a network picture either in a supply chain structure or as a network structure; see Ramos and Ford, 2010; Mattson, 1986; Håkansson, 1992; Håkansson et al., 2009. All other four network picture characteristics and the associated stimuli designs showed good discriminant validity. After some minor adjustments to these stimuli and the self-typing paragraphs, a final experimental design was derived.

4.2 Stage 2: Empirical Experiment for Proposition Testing

This main experiment aimed at testing the association between the network picture characteristics and behavioral choice situations in terms of networking strategies. The experiment was conducted in spring of 2010 and involved 445 international executive MBA students. The respondents were again experienced decision-makers in their companies with an average work experience of over 8 years. Participants worked in companies across industries. Participation was voluntary and respondents were not rewarded for taking part in the study.

The factorial design used employed eight different network pictures, again comprising a pictorial and textual description of the focal firm's surrounding. Both the picture and the description contained the stimulus manipulations. As with the pre-test and with the aim of avoiding bias, two different framed pictorial versions of the network picture were provided: a 'normal' version and a mirrored one, and the sequencing of the options was randomized. Furthermore, we used two ifferent manipulations for each network picture characteristic (e.g. high power and low power network picture) in order to have a control group as part of the experiment. Participants were

asked to engage in a mental exercise, by imagining that they were managers in the 'focal firm'. They were asked to consider the network picture they were provided with as representing the focal firm's business surrounding. The subjects were allocated to one of the eight stimuli on a random basis (power = 125 respondents; dynamics = 106; broadness = 111; indirectness = 103). Following each stimulus scenario of manipulated network pictures, we provided five descriptions (see table 1) that illustrated how the focal firm could manage their existing and potential business relationships with other firms (e.g. suppliers, customers, competitors).

For each of the five different descriptions of networking models, the respondents had to indicate in a self-typing exercise the one which represented the behavioral option which was in their opinion the best suited for the given scenario. This technique simulates a strategic decision scenario with alternative options (Hodgkinson & Johnson 1999). Finally, in the last part of the questionnaire the participant's socio-demographic features (e.g. industry, work experience, role in the firm) were collected.

5. Analysis and Findings

We initially analyzed the distribution of behavioral choices (networking) by pertinent network picture characteristic. Following this, we looked at the statistical association between network picture characteristic and networking options through a Chi-square and Phi-test for categorical data, followed by regression analysis. The results are presented by network picture characteristic below.

5.1. Network picture power and networking

There were 125 respondents that answered the behavioral self-typing questionnaire for the high and low power stimuli. For each of the tested networking models, Table 2 shows the distribution of choices.

Table 2

Summary of Frequencies

Networking Models		High_Power	Low_Power	Dynamic	Static	Broad	Narrow	High_Indirect.	Low_Indirect.
Strategies for Managing a Portfolio of Alliances	Adapting	14.3%	19.4%	34.0%	5.7%	37.5%	18.2%	18.5%	18.4%
	Shaping	63.5%	22.6%	49.1%	34.0%	41.1%	41.8%	50.0%	22.4%
	Exploring	22.2%	58.1%	17.0%	60.4%	21.4%	40.0%	31.5%	59.2%
Networking in Business Networks	Consolidate or Create								
	Consolidate	31.7%	41.9%	30.2%	43.4%	50.0%	43.6%	48.1%	46.9%
	Create	60.3%	37.1%	66.0%	43.4%	41.1%	47.3%	42.6%	44.9%
	Neither	7.9%	21.0%	3.8%	13.2%	8.9%	9.1%	9.3%	8.2%
	Confront or Conform								
	Confront	68.3%	32.3%	75.5%	41.5%	48.2%	38.9%	63.0%	38.8%
	Conform	15.9%	48.4%	11.3%	41.5%	28.6%	38.9%	20.4%	30.6%
	Neither	15.9%	19.4%	13.2%	17.0%	23.2%	22.2%	16.7%	30.6%
	Coerce or Concede								
	Coerce	68.3%	25.8%	58.5%	47.2%	35.7%	58.2%	51.9%	58.3%
	Concede	12.7%	59.7%	26.4%	32.1%	50.0%	25.2%	25.9%	33.3%
	Neither	19%	14.5%	15.1%	20.8%	14.3%	16.4%	22.2%	8.3%
Relationship Management Modes	Accommodation	11.1%	33.9%	18.9%	22.6%	18.2%	12.7%	11.1%	22.4%
	Submission	0.0%	21.0%	7.5%	3.8%	12.7%	7.3%	9.3%	2.0%
	Collaboration	30.2%	17.4%	30.2%	49.1%	41.8%	41.8%	51.9%	46.9%
	Negotiation	11.1%	6.5%	9.4%	7.5%	9.1%	14.5%	9.3%	14.3%
	Administration	46.0%	8.1%	30.2%	15.1%	16.4%	21.8%	18.5%	14.3%
	Domination	1.6%	3.2%	3.8%	1.9%	1.8%	1.8%	0.0	0.0%

For Hoffman's (2007) model, a network environment characterized by high power favours shaping strategies (63.5% of respondents), while low power situations made the respondents choose exploring strategies (58.1%). For Ford et al. (2002), high power relates to creating, confronting, and coercing strategies of managing (60.3/68.3/68.3%), while low power choices are less clear-cut: consolidation and creation, and confronting and conforming are equally valid for the respondents (41.9/37.1 and 32.3/48.4% respectively). For Krapfel et al.'s (1991) relationship management modes, high power shows administration and collaboration to be the preferred options (46 and 30.2%), while low power favours accommodation and submission (33.9 and 21%). Table 3 shows that overall the characteristic of power in the cognitive schema of managers as represented in their network pictures is significantly associated with all different models of strategic behavior, i.e. networking. For the network picture characteristic Power, the Chi-square coefficients are moderate to high (between 8.019 and 38.198) and all highly significant. Phi-coefficients corroborate these results.

Table 3

Significance of Finding

	Networking Models		Pearson Chi_Square	Sig.	Phi	Sign.
POWER (125 respondents)	*Strategies for Managing a Portfolio of Alliances*		22.600	0.000	0.425	0.000
	Networking in Business Networks	Confront or Conform	18.572	0.000	0.385	0,000
		Consolidate or Create	8.019	0.018	0.253	0,018
		Coerce or Concede	31.467	0.000	0.502	0,000
	Relationship Management Modes		38.198	0.000	0.553	0.000
DYNAMICS (106 respondents)	*Strategies for Managing a Portfolio of Alliances*		25.071	0.000	0.486	0.000
	Networking in Business Networks	Confront or Conform	14.619	0.001	0.371	0,001
		Consolidate or Create	6.517	0.038	0.248	0,038
		Coerce or Concede	1.407	0.495	0.115	0,495
	Relationship Management Modes		6.341	0.274	0.245	0.274
BROADNESS (111 respondents)	*Strategies for Managing a Portfolio of Alliances*		6.836	0.033	0.248	0.033
	Networking in Business Networks	Confront or Conform	1.430	0.489	0.114	0,489
		Consolidate or Create	0.482	0.786	0.066	0,786
		Coerce or Concede	7.486	0.024	0.260	0,024
	Relationship Management Modes		2.468	0.781	0.150	0.781
INDIRECTNESS (103 respondents)	*Strategies for Managing a Portfolio of Alliances*		9.700	0.008	0.307	0.008
		Confront or Conform	6.132	0.047	0.244	0,047
		Consolidate or Create	0.074	0.963	0.027	0,963
		Coerce or Concede	3.794	0.150	0.193	0,150
	Relationship Management Modes		5.260	0.262	0.226	0.262

5.2. Network picture dynamics and networking

Of the 106 respondents being presented the dynamics-related network picture stimuli (i.e. dynamic or static), shaping strategies were preferred for dynamic, and exploring strategies for static business environments in terms of Hoffman (2007) model (49.1/60.4%). Results for Ford et al. (2002) see dynamic network environments favour creation, confrontation, and coercion (66/75.5/58.5%), while static environments do not show clear differentiations in terms of the different networking options. For Krapfel et al.'s (1997) model a dynamic network is linked with collaboration and administration (30.2/30.2%), while static ones favour collaboration (49.1%). In terms of statistical association between network picture dynamics and the different networking models, there exists a high and significant association with Hoffman (2007) (chi-square of 25.071). The other two models show more mixed results: Ford et al. (2002) partially works on the first two dimensions, but the coerce versus concede options do not discriminate for network picture dynamics (chi-square of 1.407 with a significance level of 0.495). Krapfel et al. (1991) also does not seem to be associated with issues of the dynamic nature of network pictures.

5.3. Network picture broadness and networking

A total of 111 respondents were shown either broad or narrow network pictures. For both situations, Hoffman's (2007) model did not clearly provide dominant behavioral options, a result that was replicated for the different aspects of Ford et al. (2002) (with the exception of the choice of coercion for the narrow network picture stimulus; 58.2%). For Krapfel et al. (1997), both options (broad and narrow network pictures) favour collaboration strategies (41.8/41.8%). In terms of association tests, the chi-square coefficients are moderate and significant only with respect to the Hoffman (2007) model (6.836 with a significance level of 0.033), while the Krapfel et al. (1991) and the Ford et al. (2002) networking options do not

show significant associations with the dimensions of broadness of network pictures (an exception is the coerce versus concede aspect with a chi-square of 7.486 and significance of 0.024).

5.4. Network picture indirectness and networking

Finally, 103 respondents answered self-typing questions based on manipulated indirectness stimuli (based on network pictures showing high or low indirectness). For high and low indirectness, shaping and exploring strategies respectively (50/.0/59.2%) were chosen most often from the Hoffman (2007) model. The choice between confront and conform (Ford et al., 2002) was indecisive for both high and low indirectness; however, high indirectness favoured the behavioral choices of confronting and coercing (63/51.9%), while for low indirectness again coercion was chosen most often (58.3%). It is noteworthy that the choice between confronting and conforming for low indirectness was again inconclusive, with 30.6% of respondents choosing the 'neither' option, indicating that this networking choice is not relevant for the situation. Collaboration was the preferred behavioral networking choice for both high and low indirectness stimuli vis-à-vis the Krapfel et al. (1991) model. In terms of statistical association, the chi-square test indicates a moderate but significant association between indirectness and Hoffman (2007) model (9.7, with significance level of 0.008). Both the Krapfel et al. (1991) and the Ford et al. (2002) networking models do not show significant associations with the indirectness of network pictures (the confront *versus* conform choice is marginally significant with chi-square of 6.132, significance of 0.047).

5.5. Regression analysis

To understand the effect that different network picture characteristics have on networking, we used nominal regression analysis for the Hoffman (2007) model as this is the only one which shows significant associations with all of the four pertinent characteristics. We use all eight stimuli as independent variables, with the behavioral networking options being the dependent variables. Through anchoring the nominal regression model either for the adaption, shaping or exploring alternatives, we get beta-coefficients and significance levels for each of the stimuli. We present the findings for the model anchored in the exploring option as this represents the most frequent dependent variable.

Starting with the shaping option of Hoffman (2007), this kind of strategic behavior of networking in business relationships is significantly and strongly related to situations where the focal company is characterized by a high power position in the network (beta=2.019; significance level of 0.000), as well as a dynamic network environment (2.030; 0.000), narrow network pictures (1.620; 0.001) and high levels of indirectness (1.432; 0.002). Regarding the exploring strategy, this is again linked strongly and positively to a dynamic network picture (1.863; 0.001) but also to a broad network environment (1.730; 0.001). All other beta-coefficients proved to be non-significant. To present the regression model for the exploring strategy, we use the second most frequently chosen strategy as our anchor, i.e. shaping. Thus, the networking by exploring is linked negatively to the independent variables of high power (-2.019; 0.000; meaning that in situations of high power network pictures, the behavioral option of exploring is discriminated against by managers), a dynamic network environment (-2.030; 0.000), a broad network picture (-1.620; 0.001), and high levels of indirectness (-1.432; 0.002).

5.6. Findings and Proposition Analysis

Based on the discussion of different network pictures characteristics, some general propositions were derived which link these characteristics to networking strategies. Specifically, we suggested that there exist associations between the actor's network pictures which represent managers' idiosyncratic understanding of the business network, and actor's networking decisions. We specifically test four network picture characteristics and three main models for strategic behavior in networks, i.e. networking strategies.

Based on our analysis, overall the model proposed by Hoffman (2007) shows clear associations with all four network picture dimensions of power, dynamics, broadness, and indirectness. On the other hand, the models for networking derived from Ford et al. (2002) and Krapfel et al. (1991) show much less equivocal results and provide significant associations only with a limited number of network picture characteristics. Thus, while all four propositions can be supported for the Hoffman (2007) model, this is not the case for the other tested models of strategic networking.

Specifically, the perceived position of power for the focal company within the business network is significantly associated with all three models, thus unequivocally supporting proposition 1, which stated that there exists an association between the actor's level of perceived power in the business network and that actor's networking decisions.

For the network picture characteristic of dynamics, Krapfel et al.'s (1991) model can be rejected, while for the different behavioral alternatives of Ford et al. (2002) only the pair of confront versus conform is significantly associated, while the options consolidate versus create are marginally significant, and coerce versus concede are not significant, thus only partially supporting the presence of an association between the actor's level of perceived dynamics in the surrounding business network and that actor's networking decisions (proposition 2). The choice between coercing versus conceding (Ford et al., 2002) is the only

part of this model that is associated with the network picture characteristic of broadness, besides the Hoffman (2007) model. Again, the relationship management modes proposed by Krapfel et al. (1991) do not correspond significantly with the manipulated broadness stimuli. Proposition 3 is therefore also partly supported: only a partial association between the actor's level of perceived broadness of the surrounding business network and that actor's networking decisions. Lastly, the network picture characteristic of indirectness is only significantly associated with Hoffman (2007) and marginally significant with the confront versus conform option of Ford et al. (2002). All other models are not significant, thus again only partly supporting proposition 4: there exists an association between the actor's level of perceived indirectness of the surrounding business network and that actor's networking decisions.

6. Conclusions, Limitation and Further Research

This study set out to determine if and how actors' networks pictures affect managerial decisions in terms of networking strategies. Our empirical findings enable us to provide an understanding of how different aspects of managerial sense-making affect strategic action in business networks.

In the literature it has been already established that network pictures are important tools for managerial action. However, so far the relationship between cognition and action in business networks had not been explored. In this study, an experiment was designed with the aim of assessing the impact of four specific network pictures characteristics on a set of chosen behaviors. This set has been created so as to cover different aspects and perspectives of the strategic thinking.

One of the most significant finding that emerges from the study is that there is a strong association between network picture characteristics and managerial decisions. This is particularly evident for the strategic choices put forward by Hoffman (2007): significant

associations were found between the four pertinent characteristics used in our experimental design study. The study also demonstrated that the models for networking derived from Ford et al. (2002) and Krapfel et al. (1991) show much more equivocal results: significant associations are found only for a limited number of network picture characteristics. On the other side, looking at network pictures features, power seems to be the most relevant feature driving managers' strategic choices.

This study contributes both to the marketing and strategy fields of research by attempting to understand the reasons underlying managerial choices and consequent actions. Compared to previous studies in the field, this research was not limited to understanding "what" are managers' strategic decisions: instead it went in-depth in order to provide explanations for why specific decisions are made. Furthermore, the study provides a contribution by operationalizing and empirically testing some concepts (i.e. network pictures characteristics and networking strategies), which in previous studies have been only theoretically derived and described.

This research also provides some insights on a methodological level. Experimental design has often been used in a business-to-consumer setting with the aim of studying the effect of cognition on consumer behavior. However, only few applications can be found in the business-to-business area, namely for looking at relationships between firms (see Besharat, 2010; McCoy & Hargie, 2007). Moreover, none of the previous studies has drawn on a manipulation of managers' interpretation of the surrounding, a technique that was employed in this paper's empirical work.

Some important limitations to the conducted research need also to be considered. First of all, our study focused on managers' behavioral choices in a situation where they were not exposed to influences by other actors, not interacting with each other; the research's design reflects this context. This situation of isolation would hardly occur in real life: "*understanding the*

process of strategic management is […] centrally concerned with explaining how diverse frames of reference are reconciled within and between organizations in order to formulate and implement strategies" (Hodgkinson, 2005, p. 31). Through interaction, representations of business actors become more stabilized and homogeneous, leading to collective cognition (Walsh and Ungson, 1991). Many different possible images of the same network space co-exist within the same company or network, as many as the actors involved in them (Ramos, 2008). Comparing different network pictures may be useful in order to both show on which elements there is an overlapping of opinions and on which divergences emerge (Ramos, 2008). Based on these preliminary remarks, it would be interesting to carry out another experiment which would involve groups of interacting individuals rather than single managers. In this sense, results from our study could be particularly useful to understand how choices and behavior change when decisions are made independently or in groups.

Further research could also explore the dual nature of network pictures: on the one side as determinant of actors' behaviors in interactions, and on the other side as result of these interactions. In the first case, network pictures affect the intertwining of different behaviors generated during interactions, while in the second situation each actor's perceptions and interpretations are influenced by a complex web of relationships. In the latter case, the possibility of images of reality stabilizing is conditioned by the strength, direction, and dynamics of the influences that thee other relationships in the network exercise over individuals' network pictures (Weick, 1995). The relationship between picturing and acting is therefore bidirectional; this study has focused on network pictures as determinant of actors' actions, but further research could focus on how these decisions and behaviors affect the formation of subsequent pictures.

Finally, studies on network pictures tend to emphasize the cognitive aspect of the process of framing. More broadly, notwithstanding the extant research in social, managerial and

41

organizational psychology which shows that cognition can explain a relevant part of behaviors, we should also consider that emotions can play an important role for explaining the emergence of network pictures and how they change over time. Affective response is an emotional response that expresses an individual's degree of preference for an entity. Affect and cognition do not always work independently (Soika & Giese, 2006) and a more fully understanding of behavior would require considering both.

7. Managerial Implications

Beyond the relevance outlined above of the present research in terms of academic theory, there are important managerial implications arising from this study. First of all network pictures can be considered as tools for better understanding managerial actions, allowing an increase of their effectiveness. Our findings add substantially to our understanding of how managerial action is generated. Our study shows that there is a strong association between managers' cognitive frames and managers' decisions: in other words, when managers' network pictures are characterized in a certain way, the likelihood that these mangers undertake certain decisions increases significantly. One immediate claim to this statement is that managers' decisions are not taken in isolation, as simulated with the experiment design that we applied, but instead occurring within interactional processes between actors. Even if this consideration is obviously reasonable, knowledge on how individuals behave without influences from the external environment can be a starting point for understanding how they will behave in interaction. Moreover, it can also be useful to grasp what the differences in behaviors are when managers act in groups instead of individually. Alignments and misalignments between network pictures of different actors should be carefully analyzed in order to understand what the resulting behaviors are. Inter-organizational negotiations, due-

diligence, and team building are only some examples of managerial contexts where the network pictures concepts could be applied to support strategic decision processes.

Comparing the network pictures of different actors in the firm may also support information and knowledge sharing (Porac et al, 1989). Network pictures can help actors to understand each other's views of the business surrounding and enrich their reciprocal ideas (Walsh and Ungson, 1991). They can be used, for instance, to facilitate strategic inter-organizational negotiations.

Finally, network pictures can also be considered as tools for supporting intra and inter-organizational communication processes. Communication can impact the interpretation of situations and events as mutual influences arise and actors' perceptions may converge toward a common representation of certain aspects of the network. If actors need stories to make sense of business life, network pictures can be considered a synthesis of these stories. People use stories to align newly enacted outcomes with pre-existing knowledge (Rosa & Spanjol, 2005). If, as we have empirically shown, network pictures affect actors' behaviors, the mechanisms through which these images emerge and change are important issues that managers should carefully consider.

In conclusion, managers may benefit from understanding how network pictures can be used as tools for supporting firms in defining their strategy and to facilitate manifold important managerial activities related to intra-organizational alignment or inter-organizational exchanges.

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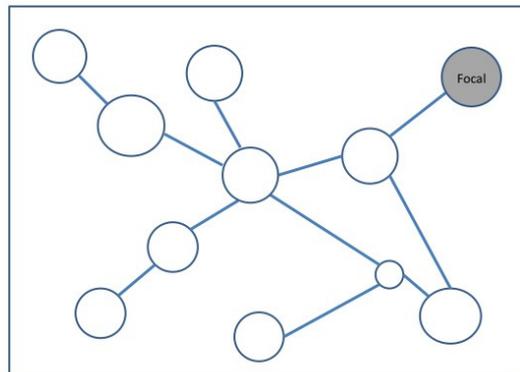
Appendix 1

Pictorial and textual description of the business surrounding in an high power situation by the focal firm.
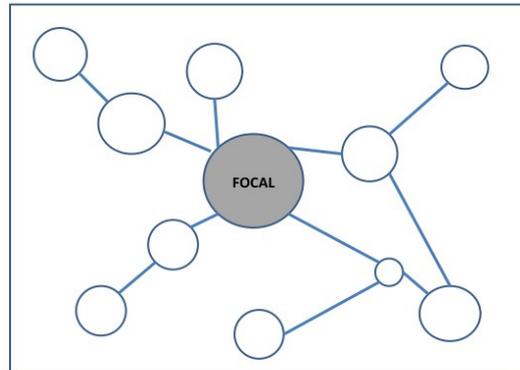

"The focal firm has a dominant position in the market where it operates. It has several relationship partners and has a strong influence over them. It also plays a primary role in the definition of the overall development of the industry where it develops its business activities."

Pictorial and textual description of the business surrounding in an low power situation by the focal firm.

The focal firm has a peripheral/marginal position in the market where it operates. It has a low number of relationship partners and has low level of influence over other firms. It also plays a secondary role in the determination of the overall development of the industry where it develops its business activities.

Pictorial and textual description of the business surrounding in a dynamic situation.
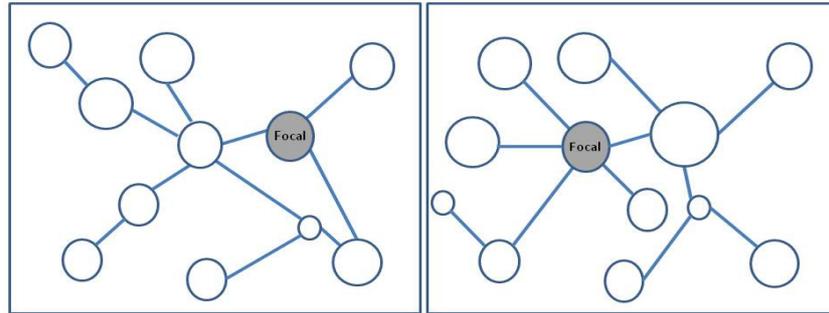

In the business environment where the focal firm is operating there are multiple companies of varying types. Over the last three years, several changes have taken place in that market. Many existing relationships have been terminated, but new ones have also been initiated. This has resulted in changes in the positioning that the focal firm and others occupy in the market. companies of a diverse nature. These companies interact with each other to develop their business activities.

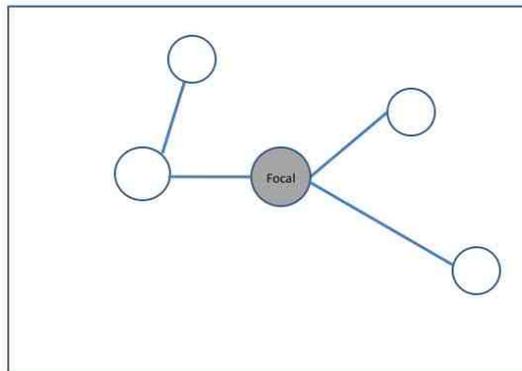**Pictorial and textual description of the business surrounding in a static situation.**
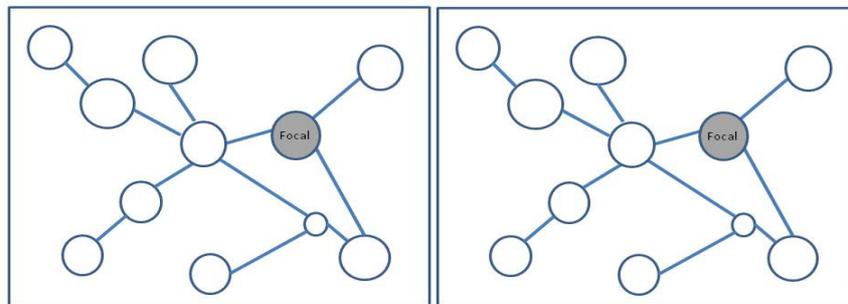
At the present, in the business where the focal firm is operating, there are multiple companies of a diverse nature. These companies interact with each other to develop their business activities.

Pictorial and textual description of the business surrounding in a broad situation.
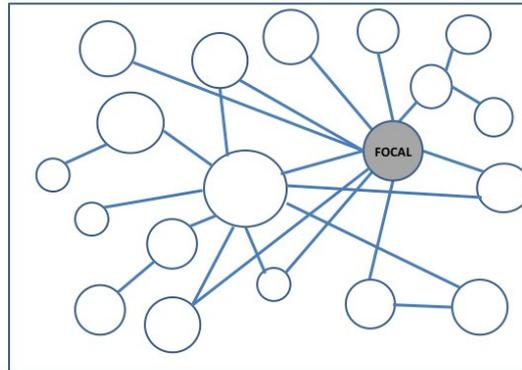

In the market where the focal firm is operating, there are several companies (e.g. suppliers, customers and competitors) and governmental organizations (e.g. National Government and the European Commission). There are multiple ties between these firms.

**Pictorial and textual description of the business surrounding in a narrow situation.**

In the market where the focal firm is operating, there are very few companies and a low number of ties between them.

Pictorial and textual description of the business surrounding in a situation of high indirectness by the focal firm.
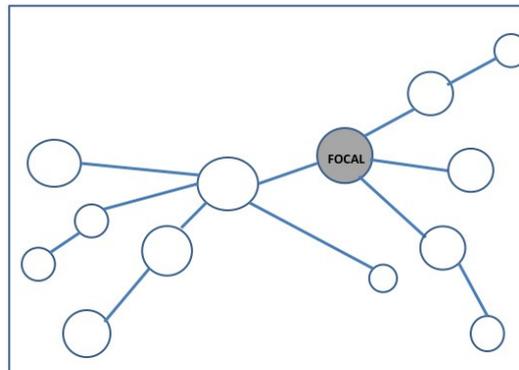
The focal firm where you work has relationships with business partners, which in turn also have relationships with other companies. This means that, besides having direct access to the resources of other companies, the focal firm also has the real potential to access the resources of these other companies.

Pictorial and textual description of the business surrounding in a situation of low indirectness by the focal firm.
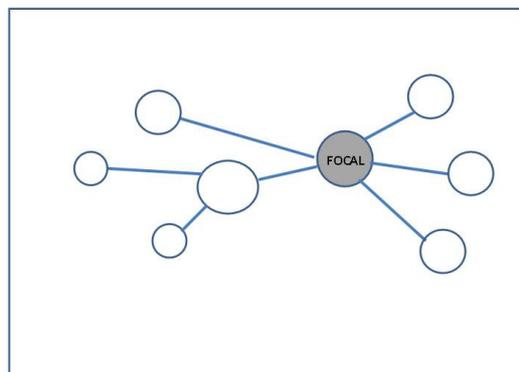
The focal firm has relationships with direct business partners, and only a few of these have relationships with other companies. This means that, besides the access to the resource of its direct business partners, the focal firm has a very limited possibility to use the resources of third parties.

Appendix 2.

Pre-test Stage: questions asked with reference to each network picture

1. This scenario represents the focal firm as being in a <u>powerful position</u>.
2. This scenario represents a <u>changing</u> environment for the focal firm.
3. This scenario portraits a high <u>number of actors and relationships</u> in the focal firm's business surroundings.
4. This scenario resembles a <u>network much more than a supply chain</u>.
5. This scenario reflects a high number of <u>indirect relationships</u> that the focal firm has through other actors.
6. In this scenario the focal firm is <u>not able to influence the other parties.</u>
7. In this scenario, the focal firm's environment is <u>not very dynamic.</u>
8. In this scenario, the focal firm <u>does not interact with many </u>other firms.
9. In this scenario, the firm's environment is <u>represented as a chain of relationships instead of a network.</u>
10. In this scenario, there are mostly <u>direct relationships</u> between the focal firm and other firms.