

## Researching Multilevel Phenomena: The Case of Collaborative Advantage in Strategic Management

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### Abstract

A number of literatures in management, innovation studies, economic geography, and so on point to “collaborative advantages” that can arise at multiple levels. We discuss conceptual, theoretical and methodological difficulties with this and related notions. Many of these difficulties stem from the multi-level nature of these constructs themselves, as well as from the fact that their antecedents and consequences may be located at multiple levels. Accordingly, this paper offers a condensed primer on multi-level conceptual and methodological issues pertaining to collaborative advantage in order to guide future research. We focus much of our discussion on a particular type of collaboration –strategic alliances among business firms–, an area of research that plays a central role in strategic management, international business and organizational science. Despite this focus, most of the ensuing discussion applies equally well to other kinds of collaborations and we draw parallels to these where relevant.

*Keywords:* Strategic alliances, multi-level theory and empirics, competitive, collaborative advantage

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Collaboration is inherent in any operating market economy, and firms seek collaboration because of its advantages relative to noncollaboration. Researchers have proffered the notion of *collaborative advantage* to capture these rewards (Dyer, 2000; Huxham, 1996; Huxham & Vangen, 2005; Kanter, 1994; Lank, 2005). The notion has a potentially broad scope and, in principle, may characterize synergistic collaboration ranging from dyadic exchange to the national level. However, such a broad scope of application is actually ground for worry and warrants closer examination of the concept and neighboring ideas.

At the most abstract level, collaboration simply means nonautarchic; thus, Austrian economist Von Mises (1936) saw the division of labor as organized under capitalist institutions as a primary example of peaceful collaboration. Less abstractly, collaborative advantage may relate to notions of social capital and generalized trust. Still, such understandings capture a large part of extant social science research. A more narrow understanding of collaborative advantage is necessary to avoid engaging in an unproductive relabeling game. In fact, starting with important contributions by Hirschman (1970) and Richardson (1972), for example, modern writers associate collaborative advantage with (typically) long-lasting and stable relations between actors, supported by informal trust relations, relations based on formal contracts or property rights, or some combination thereof (Lazzarini, Miller, & Zenger, 2004). The relevant actors may exist at different analytical levels (e.g., individuals, firms, dyads, industries, clusters, regions, and nations) and may in turn be embedded in various formal and informal institutions (North, 1990) as well as in certain geographical contexts.

However, even this conceptual narrowing of the notion of collaborative advantage still implies a reference to large and expanding research in economics (e.g., economic geography, urban economics, and trade theory), sociology, and management (e.g., strategic management, international business, and innovation studies) which involves different ways, of examining the morphology of collaboration and collaborative advantage and identifying their antecedents and consequences. Researchers use different methods, ranging from longitudinal single-case studies to multilevel panel data studies incorporating state-of-the-art econometrics. Not surprisingly, it is unclear that what is effectively a jumble of contributions actually adds up to robust generalizations and insights.

Because so few obvious constraints on the meaning of collaboration in the social domain exist and because the meaning is mixed up with fundamental multilevel issues, with respect to conceptualization, antecedents, and consequences, clarity and rigor in relation to methods of construct definition and location of constructs at various analytical levels are essential. For example, while collaborative advantage may be well defined at the level of firm dyads (Dyer & Hatch, 2006; Richardson, 1972; Williamson, 1985), the definition is less clear at higher levels of analysis, such as industries or industrial districts. Alternatively, collaborative advantage at the higher levels may actually mean something different from collaborative advantage at the dyadic level and exhibit different antecedents and consequences. As the notion of collaborative advantage traverses levels of analysis, antecedents likely differ (Nielsen, 2010).

As these examples indicate, many of the difficulties of researching collaboration and collaborative advantage stem from the multilevel nature of the constructs themselves and from the fact that their antecedents and consequences may be located at multiple levels. For instance, regarding antecedents, dyad-level collaborative advantage (e.g., superior innovation resulting from pooling innovation capabilities in specific projects) may arise from particularly skilled research and development (R&D) personnel or alliance managers, the firm's endowments of innovation capabilities or experiences from previous R&D collaboration, advantages accruing to the specific region in which it is located, governmental support programs, or broad societal institutions. Thus, collaborative advantage may have antecedents on lower (micro) as well as higher (macro) analytical levels (Knudsen & Nielsen, 2010). In fact, one of our key points in the following is that researching collaborative advantage inherently requires a multilevel approach. Theoretically, one must consider antecedents and consequences at different levels, as well as potential cross-level effects. In the existing research, such consideration is lacking; research on national systems of innovation (e.g., Lundvall, 1992) often does not extend to firms, which logically must be part of the microfoundations of such systems. Similarly, researchers have devoted little effort to defining the level at which constructs operate or to developing theory within the strategic alliance field to explicitly address the role of variables at different levels (Nielsen, 2010). Researchers need to adopt proper (i.e., multilevel) empirical research methods to identify relevant causes and avoid introducing bias into estimated parameters.

Accordingly, this paper functions as a condensed primer on multilevel conceptual and methodological issues pertaining to collaborative advantage to guide future research. Rather than all-encompassing, the focus of much of the discussion is on a particular type of collaboration, strategic alliances among independent business firms, because this area of research is central to strategic management, international business, and organizational science. Despite this focus, most of the ensuing discussion applies equally well to other kinds of collaborations to which parallels are drawn where relevant. A further limitation is the restriction of the inquiry to variable-centered theoretical and empirical analysis, so the discussion does not relate to collaborative advantage in the context of small-N research,<sup>1</sup> such as narrative approaches or approaches relying on the comparative case method.

## **Collaborative Advantage: Meaning**

### ***Construct Clarity***

Constructs are among the fundamental building blocks of theories, and clear constructs are necessary (although insufficient) for good theorizing. Clear constructs aid in coordinating and disseminating research efforts because clarity facilitates communication, which promotes the growth of knowledge. Clarity further simplifies empirical work by making identifying proper sample frames and reducing concerns with construct validity easier. Suddaby (2010) described the four basic elements required to arrive at clear constructs as follows:

1. providing *definitions*, which involves “the skillful use of language to persuasively create precise and parsimonious categorical distinctions between concepts” (p. 347);
2. identifying *scope conditions* that delineate the circumstances under which the concept meaningfully applies;
3. clarifying *semantic relationships* to other related constructs (because constructs do not arise de novo but build on other existing constructs); and, finally,
4. demonstrating the *logical consistency* or *coherence* of the construct in relation to the overall theoretical argument.

Constructs do not come ready-made with clear definitions, properly delineated scope conditions, and so on. While a significant part of scientific activity is establishing causal links between constructs (i.e., theorizing) and testing the resulting propositions, sorting out definitional issues, scope conditions, and semantics issues constitutes quite a significant and important component of scientific activity, especially in the social sciences.

To illustrate with a highly relevant construct, competitive advantage has existed in the strategic management field, one of the major management fields, for at least four decades. Competitive advantage is conventionally the central construct of the field and, as such, serves to organize research efforts. For example, researchers often conceptualize strategies as plans to achieve competitive advantage. However, only quite recently have researchers properly clarified this central organizing construct in terms of precise definitions and scope conditions (Peteraf & Barney, 2003).<sup>2</sup> Much strategic management literature discusses competitive advantage in terms of financial success (really an *outcome* of competitive advantage) and conceptualizes it relative to suppliers and buyers (rather than only competitors). If a relatively well-established concept that has served to organize research efforts in an influential field for four decades can be fraught with lack of definitional and scope clarity, one should not be surprised to see recent constructs characterized by lack of clarity. Such is the case with collaborative advantage.

## Collaborative Advantage

Collaborative advantage is clearly a recent construct. Kanter (1994) coined the concept to refer to the specific advantages that may accrue to firms that set up strategic partnerships with other firms (e.g., joint ventures) by virtue of such cooperation. Another early inventor/adopter of the construct is Huxham (1996), who used the construct generically to refer to any advantage from any kind of collaboration, apparently at any level of analysis (see also Huxham & Vangen, 2005).<sup>3</sup> Subsequently, the construct appears in the context of work on strategic alliances written for the popular business book market (e.g., Dyer, 2000; Lank, 2005). Use of the Google Scholar search engine confirmed that the construct per se does not enjoy widespread use in academic journals. However, collaborative advantage obviously connects to a very broad set of established social science and management constructs and ideas; many scholars use similar and related notions to capture synergistic collaboration.

Given the context of the construct, it is, perhaps, not surprising that no rigorous definitions of the construct have emerged. Writers usually are satisfied with providing illustrative examples of collaborative advantage, examples that somehow indicate that partners in some venture may realize advantages that accrue to them by virtue of their specific collaboration. Such an explanation is so broad as to make the construct almost devoid of content and illustrates what Suddaby (2010) called the “most common error in developing constructs ... making them too general” (p. 348).

Moreover, because of the potentially extreme inclusiveness of the collaborative advantage construct, presenting anything meaningful about approaches to researching collaborative advantage, the main purpose of the present paper, may seem difficult. If one can apply collaborative advantage, in principle, to any level of analysis (i.e., the dependent variable collaborative advantage can meaningfully be postulated at any level ranging from the level of collaborating individuals to collaborating nations), basic problems regarding the nature of the explanans (i.e., the independent variables and how they are causally related) emerge. The theoretical explanation sought for explaining collaborative advantage at one level being isomorphic with the explanation sought for explaining collaborative advantage at a different level is highly unlikely. The explanatory (independent) variables likely differ, and the same variables may be causally related in different ways, depending on the level to which an explanation is sought. The implication is that no unified theory of collaborative advantage can exist, merely an ensemble of theoretical accounts of collaborative advantage at different analytical levels. Such incoherence is hardly desirable.

However, the extant literature on strategic alliances in management research, as well as basic notions from economics, allows for a more specific definition. Particularly, the following components are integral to a more precise understanding of collaborative advantage:

### ***Advantage:***

From strategic management literature, one can define *advantage* as a relative construct, namely the potential to create and capture *more* value than the relevant competition over some specified period. From a theoretical perspective, one can completely order actors based on the extent to which they enjoy advantage.

### ***Collaborative Advantage:***

Given the relative nature of advantage, collaborative advantage must imply the involvement of potential supernormal gains from trade; specifically, because of its collaborative activities, a firm is capable of creating and capturing more value than are other comparable firms. The latter category includes competitors within an industry (or a strategic group) as well as potential competitors (i.e., firms currently outside of the industry or the strategic group). The relevant potential supernormal gains from trade may stem from collaboration in the horizontal dimension, as when firms collaborate with competitors or complementors. Alternatively, the gains may stem from collaboration in the vertical dimension, such as close relationships with supplier firms or customers.

The cases are obviously analytically different and carry dissimilar policy and strategy implications. However, space considerations prohibit a discussion of these issues. Clearly, the relevant exchange that underlies collaborative advantage must go beyond ordinary spot-market exchange, which is in principle open to any actor and therefore will not confer any advantage. Thus, collaborative advantage typically involves longer term relations between nonanonymous parties who participate in a venture in which they pool complementary resources or the services of such resources to reach some shared goal. A model example is the mutual conferment of specific investments to a relation, intensely studied in transaction cost economics (TCE; Williamson, 1985).

### ***Locus of Collaborative Advantage:***

Given the association of advantage with (potential) appropriable value creation, one is dealing with actors who interact in *markets* because appropriable value creation is only well defined for such actors. The implication is the exclusion of collaboration between, for example, public utilities that do not interact on a market. One should primarily associate collaborative advantage with firms and locate such advantage at the firm level.

Often notions of advantage are transferred from the level of firms to higher level entities, such as regions (Storper, 1992) or even nations (Porter, 1990). The basic idea is that traded and untraded interdependencies (i.e., pecuniary and nonpecuniary externalities) may be geographically circumscribed and accessible to insiders at significantly lower cost than to outsiders (Foss & Eriksen, 1995). The interdependencies, which span multiple resource categories (abundant supply of advanced engineering services, trust relations, information flows, etc.), in effect become a kind of club goods (Buchanan, 1965).

Writers often discuss industries, districts, and regions characterized by such interdependencies as possessing advantage. While certain resources of a collaborative kind indeed arise in the interaction between firms, and as such in a certain sense lie outside of the boundaries of the firm (e.g., generalized trust relations in industry), the fact remains that firms are the loci of advantage and of the value creation and appropriation that such advantage may produce. That this may benefit, for example, a region is obvious; however, the benefit emerges because firms appropriate the value creation that collaborative advantage may yield and subsequently split it among the multiple stakeholders of the relevant firms, many of which are likely to be located in the region. The question remains whether proposing that the region as such can hold a collaborative advantage makes sense.

### ***Antecedents of Collaborative Advantage:***

The antecedents of collaborative advantage include improved knowledge of the partner and of the opportunities possible through collaboration (learning economies), building of trust, and scale and scope advantages from the pooling of complementary resources. More generally, a typical conception is that the ability to perform better in (subsequent) collaborations is embedded in repetitive organizational activities that a firm develops to deploy its resources in collaborations (Helfat & Peteraf, 2003). One may argue that, for example, improved knowledge of the partner is mainly located at the individual level (e.g., in the memory of alliance managers, chief executive officers, etc.). Thus, antecedents of collaborative advantage may also exist at the level of individuals, in concert with the strategic and structural levels (Knudsen & Nielsen, 2010). Related antecedents may exist at higher levels, such as industry level (Foss & Eriksen, 1995).

### **Scope Conditions:**

Suddaby (2010) argued, in contrast to the “physical sciences, few constructs in organization theory have universal application” (p. 348). Indeed, much organizational theory is middle-range theory (Merton, 1968), which is theory that only applies to a small set of phenomena/dependent variables, often only one. For example, research developed to understand certain aspects of large, vertically integrated, and publicly traded firms might not be relevant to comprehend entrepreneurial upstart firms.<sup>4</sup> In this case, the scope of theory is limited in the horizontal dimension because the theory applies to (the level of) firms but only to a subset of firms.

Multilevel researchers argue that a vertical dimension to the scope of a theory is also apparent. Indeed, the level of theory notion refers to the focal unit or target at a given level (e.g., firm or dyad) that a researcher aims to explain: “It is the level to which generalizations are made” (Rousseau, 1985, p. 4). The focal unit, in turn, determines the appropriate level associated with key constructs of interests. Typically, collaborative advantage is realized in small-numbers interaction (Williamson, 1985), such as joint ventures, strategic alliances, consortia, or the like, and involves some specific and complementary assets. In these cases, the relevant levels of theory are those of the participating firms as well as the (dyadic) level of their collaborative activity.

As previously suggested, cases exist in which quite a large number of actors collaborate as a group and arguably hold advantages relative to outsiders because they participate in a network (region, industry, etc.) that moves significantly beyond the dyad. In such cases, considering an additional level of theory, namely the level of the network as a whole, may be meaningful. Writers who argue that firms can benefit from participating in “clusters” (Porter, 1990) or “national systems of innovation” (Lundvall, 1992) or that industry membership provides access to specific “industry capabilities” (Foss & Eriksen, 1995) implicitly or explicitly work with such a multilayered framework. Yet, only to the extent that the dependent variable is theorized at the network or cluster level (e.g., studies of how national systems of innovation or industry clusters compete with other similar types of networks) is the level of theory at this higher level. As previously indicated, there are reasons to be skeptical of claims that collaborative advantage itself is meaningfully placed at such levels; however, antecedents of collaborative advantage may well be located here.

Level of measurement refers to the actual source of the data, which should correspond to the level of constructs to increase the variability predicted by the theory. For instance, if the theory specifies within-group heterogeneity (e.g., in multilevel terminology, “alliances nested within firms”; Nielsen, 2010) one should conduct data collection at the alliance level to ensure conformity with the theory and preserve the heterogeneity of the data within alliances. In such cases, one must operationalize and measure collaborative advantage as alliance-level advantages from collaborative efforts, for example, by focusing on the interactions between the partners in each specific alliance.

Finally, the level of analysis relates to the unit to which data are assigned and how data are treated during (statistical) analysis. The level of analysis must align with the level of theory and measurement to assess the nested sources of variability appropriately. To the extent that collaborative advantage is theorized and measured as a firm-level construct conferring upon the firm involved an advantage in (subsequent) interfirm dealings, the level of analysis should remain at the firm level because any aggregation or disaggregation runs the risk of influencing correlations and regression coefficients as well as potentially distorting the meaning of the data altogether.

### **Multilevel Issues, Interfirm Relations, and Collaborative Advantage**

Many discussions in the organizational literature lack attention to levels in general and to microfoundations in particular (see Abell, Felin, & Foss, 2008; Dansereau, Yammarino, & Kohles, 1999; Felin & Foss, 2005). Despite the growing use of collaborative alliances in a wide variety of settings, many researchers still focus primarily on a single level of theorizing, typically the firm level. The application of diverse theoretical approaches, such as resource dependence theory, microeconomics, and strategic management, involves identifying specific (industry- or firm-level) preconditions for collaboration and using these to predict organizational outcomes. However, such approaches do not reflect consideration of the underlying microfoundational mechanisms that condition the outcomes.

Grounded in various theoretical perspectives and disciplines, such as TCE, social exchange theory, resource-based view (RBV), evolutionary theory, industrial organization, and institutional theory, alliance research spans multiple levels (Nielsen, 2010). Nevertheless, many theories do not specify the mechanisms through



which concepts at various levels are related and are effectively monolevel theories (e.g., capabilities theories in strategic management; Abell et al., 2008). While some studies attempt to integrate theories, they typically do so without considering the level of conceptualization and generalization of the theories (e.g., Heimeriks, Duysters, & Vanhaverbeke, 2007; Lee & Park, 2008). Such a lack of consideration often leads to mixing of constructs from different theoretical levels without the specification of cross-level relationships and/or predicting and testing propositions at a level that does not correspond to the underlying theory.

Multilevel theory development can help integrate such theories operating at different levels and specify the links between concepts from different levels of analysis (i.e., multilevel theory explicates level-connecting mechanisms). In particular, interactions between factors at different levels offer potential avenues for advancing strategic alliance research and may greatly improve theories about strategic alliance formation, dynamics, and performance. Collaborative advantage, whether conceptualized as an antecedent variable in models of alliance (or firm) performance or as the dependent variable, constitutes one such concept that requires theorization, measurement, and analysis through a multilevel lens.

Despite the pluralism of foundational theories invoked to examine collaborative interfirm relationships, explanations of collaborative advantage rest on a foundation of methodological individualism. Although most researchers would agree that collaborative advantage is inherently multilevel in nature, the focus of existing research is primarily on the phenomena at a single level of analysis (e.g., firm or dyad/alliance) with little attention to other effects at different levels of analysis and potential cross-level effects. According to Dyer and Singh (2004), collaborating firms can generate relational rents, defined as “a supernormal profit jointly generated in an exchange relationship that cannot be generated by either firm in isolation and can only be created through the joint idiosyncratic contributions of the specific alliance partners” (p. 351-352). The following factors determine relational rents: (a) the degree of investments in relation to specific assets; (b) the degree of knowledge exchange; (c) the extent to which complementary, but scarce, resources or capabilities are combined; and (d) the extent of effective governance mechanisms (Dyer & Singh, 2004). The main components of the rent-yielding factors are related to firm-level structural factors, such as contractual governance mechanisms.

However, relational rents also refer to the importance of more intangible aspects of co-operation, such as trust, reputation, and goodwill, as well as potentially to individual level skills and competence (Knudsen & Nielsen, 2010). The existence of specific collaborative capabilities (resulting in a collaborative advantage) may help explain why some firms perform better than do others when engaged in close collaboration activities: they “develop superior capabilities at managing particular organizational forms such as alliances” (Kale, Dyer, & Singh, 2002, p. 748). Nonetheless, to investigate the concept of collaborative advantage adequately, the first step must be to clarify the concept in terms of level of theory and measurement.

## Level of Theory and Measurement

Multilevel theory rests on the ability of researchers to identify and define the focal units of a theory appropriately (Klein, Dansereau, & Hall, 1994). After identifying a focal unit of theoretical interest, researchers can develop a multilevel theory and predict how constructs at different levels relate to each other through which mechanisms (Hitt, Beamish, Jackson, & Mathieu, 2007). Constructs are the building blocks of theory, and the level of a construct is the level at which it is hypothesized to be manifest in a given model. Hence, it is paramount to define, justify, and explain the level of each construct that constitutes a theoretical system.

Collaborative advantage raises immediate concerns regarding the appropriate level of theory as the above discussion illustrates. Some aspects of collaborative advantage rely on the firm’s ability to develop and leverage (firm-level) organizational routines, which are repetitive activities developed to deploy resources more effectively and efficiently in (subsequent) alliances (Helfat & Peteraf, 2003; Nelson & Winter, 1982). Other aspects relate to (interfirm-level) relational attributes, such as development of trust, goal congruency, and relational embeddedness (Krishnan, Martin, & Noorderhaven, 2006; Nielsen, 2005). While the former studies draw on RBV and dynamic capabilities perspectives in the argument for firm-level antecedents of collaborative capability, the literature on relational attributes of collaborative advantage typically incorporates social exchange theory, network theory, or TCE to build theoretical arguments for the value added of effective and efficient procedural and contractual governance of interfirm transactions.

Moreover, individual skills and experiences may account for an essential part of the organizational memory and entail a set of repetitive activities ensuring smooth and effective functioning of interorganizational

operations. The individual-level factors that contribute to collaborative advantage are thus related to the acquisition of new knowledge from external sources (Lane & Lubatkin, 1998). The employees participating in collaborative activities where knowledge is sourced externally play an important role. For example, work on absorptive capacity illustrated that the role of gatekeepers is pivotal. In their 1990 article, Cohen and Levinthal turned their attention towards the cognitive structures of the individuals of the organization and showed that in addition to being an organizational-level construct, absorptive capacity also exists at the individual level.

No single theory or paradigm is likely to provide an adequate foundation for a general theory explaining the antecedents and outcomes of collaborative advantage. For instance, while application of TCE may be appropriate for studying the establishment and structure of alliances, one may better assess managerial processes leading to alliance outcomes by drawing on social exchange or learning theories. In addition, the applicability of each theory may depend on situation-specific factors; for instance, the RBV may be more suitable to the study of collaborative advantage in dynamic industries, whereas institutional theory may be more relevant to collaborative advantage in international alliances than to purely domestic ones. As a result, explicit integration of theories that span different levels holds great potential for facilitating new theory generation and empirical developments in collaborative advantage research. A starting point for such theory generation is to clarify the focal unit of interest and the resulting role of collaborative advantage in the theoretical system.

### ***Nesting of Collaborative Advantage:***

The central theme of multilevel thinking is that organizational entities reside in nested arrangements and that more complete models of organizational phenomena must account for this nested structure both theoretically and empirically to advance organizational research (House, Rousseau, & Thomas-Hunt, 1995). The structure is typically hierarchically nested so that higher level units encompass those at lower levels. Identifying nested structures is important because observations within higher level units are more similar than across those units. Because lower level units share common features and influences with higher level units, they are not independent of each other. For instance, variability is apparent between firms within alliances but also between alliances in terms of performance. Whereas certain alliances perform better than do others, individual firms within each alliance may also experience different performance consequences.

Neglecting to account for such nesting may lead to incorrect conclusions if either of these sources of variability is ignored during (statistical) analysis. For example, multiple alliances formed by a firm can share some governance, management, and performance practices. Similarly, multiple alliances located in a particular country (e.g., China) may have the same governance form due to idiosyncratic institutional characteristics of that country. Most empirical research does not account for the nested structure of the data and typically either simply controls for higher level factors (e.g., industry or environmental effects) or treats them as same-level independent variables. However, such treatment may lead to misspecifications and erroneous interpretations of results due to, for example, violation of the independence assumption underlying most regression models.

In research on strategic alliances, the focal unit of interest is usually either the alliance or the firm. For instance, researchers studying alliance formation are preoccupied with identifying the factors determining the propensity to form alliances or the governance structure of the alliance. The focal unit in the former is the firm because researchers seek to explain the variability in a firm's propensity to form alliances, whereas in the latter, the focal unit and the dependent variables are specified at the level of the alliance. Essentially, the dependent variables of a particular study determine the level of theory. Studies typically include a focus on a single alliance per firm or consideration of each alliance in isolation without accounting for the interdependence of alliances as part of a portfolio.

However, managing a portfolio of alliances is likely to create value beyond the accomplishments of each alliance managed separately (Heimeriks et al., 2007). Such additional value stems from homogeneity in the processes utilized to coordinate knowledge across the portfolio of alliances (Dyer & Hatch, 2006). To the extent that multiple alliances managed by a firm share some features, similar alliance processes (management practices) are likely to influence subsequent performance.

Figure 1 depicts an example of nesting where individuals are nested in firms; firms are nested in an inter-organizational alliance, which in turn is nested in contextual environments (industry and national context). However, such nesting does not form a pure hierarchy because neither countries nor industries are nested within each other. Hence, one may view alliances as cross-classified by both industries and countries. Figure 2 illustrates an example of nesting where alliances are nested in a firm (portfolio), which in turn is nested in contextual environments (industry and national context).<sup>5</sup>

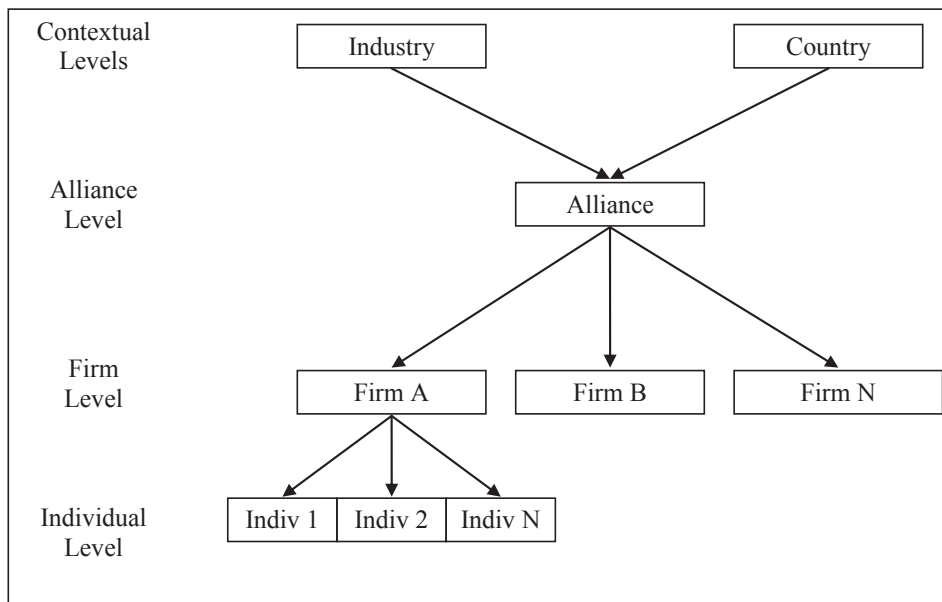


Figure 1. Alliance nesting with firm as focal unit.

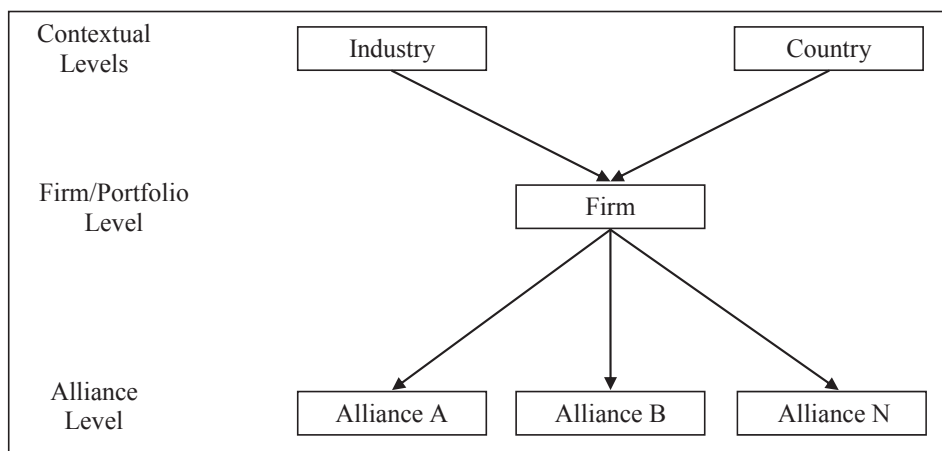


Figure 2. Alliance nesting with alliance (portfolio) as focal unit.

Thus, accounting for this similarity between alliances within firms by explicitly modeling the nesting is necessary. At the same time, recognizing that significant differences exist between multiple alliances managed by a firm is important, and this heterogeneity requires clear modeling and explanation. In terms of level of theory, measurement, and analysis, one must distinguish between constructs at each level (e.g., firm versus alliance) to model the variance at both alliance and firm level as well as the potential relationships across levels.

As previously discussed, collaborative advantage consists of at least firm- and interfirm-level antecedents (as well as potentially individual-level microfoundational predictors and network-, industry-, or country-level macrofoundational influences) and is itself an antecedent to firm- or alliance-level performance. Depending on the focal unit of theory, the theoretical building blocks of collaborative advantage may differ. For instance, if a researcher is preoccupied with explaining variability in firm-level performance as a function of a firm's collaborative advantage, the role of collaborative advantage is at the portfolio level, and the researcher must consequently conceptualize and measure collaborative advantage as a function of the firm's ability to manage synergies across multiple alliances. Alternatively, researchers who seek to explain how collaborative advantage contributes to alliance performance (e.g., measured as joint venture performance or number of patents resulting from a particular alliance) must focus on firm-level attributes contributed by the firms in the alliance. At the same time, a number of other variables at different levels may potentially influence the



relationship between collaborative advantage and performance, and the nature of such cross-level interactions is likely to vary with the level of theory. For example, while industry competitive rivalry may exert positive influence on the collaborative advantage-performance relationship at the firm level, such interaction is less likely to be theoretically justifiable when the unit of theory is the alliance portfolio. One may specify such multilevel models in several ways.

### Specifying Multilevel Collaborative Advantage Models

To the extent that phenomena at one level affect those at another, cross-level theories may be more appropriate than single-level theories. One type of cross-level theoretical model specifies antecedent predictor variables and dependent outcome variables at different levels. In terms of modeling collaborative advantage, this may imply either conceptualizing various lower (or higher) level influences on the development of collaborative advantage or treating collaborative advantage as an antecedent variable of higher level outcomes. To the extent to which one conceives collaborative advantage as a firm-level phenomenon (i.e., a firm's ability to extract superior rents from its capability to manage collaborative relationships), a multilevel theoretical model may be specified. In such a model, individual (alliance manager or gatekeeper), team (alliance team), firm (investment in alliance resources such as an alliance unit), and perhaps industry (technological change, industry structure, or profitability) characteristics would determine the amount of collaborative advantage. Similarly, if treated as an antecedent variable, multilevel models may specify how various measures of collaborative advantage influence firm or alliance performance.

A second type of cross-level model is evident in studies that include contextual factors as moderators of interfirm relationships. For instance, industry (e.g., dynamism or growth) and/or macroenvironmental (e.g., country risk, protectionist legislation, or environmental uncertainty) factors may moderate relationships between various antecedent variables and collaborative advantage or between collaborative advantage and performance. Appropriate specification (both theoretically and empirically) of moderator variables at multiple levels may yield novel insights into the conditions under which certain established relationships hold or change. Indeed, one could extend such multilevel contingency models to include multiple factors at various levels simultaneously to bring alliance research closer to the complexity of alliance practice. While rare in extant literature, moderator variables from levels below the relationships they moderate are possible and may further advance the understanding of collaborative advantage. For instance, specific characteristics (e.g., demographic or psychological) of individual alliance managers or top management teams may influence the relation between antecedent variables and collaborative advantage or between collaborative advantage and various outcome variables, such as firm or alliance performance. Figure 3 illustrates a simple multilevel model with moderators one level above and one level below the focal unit of analysis (here the firm).

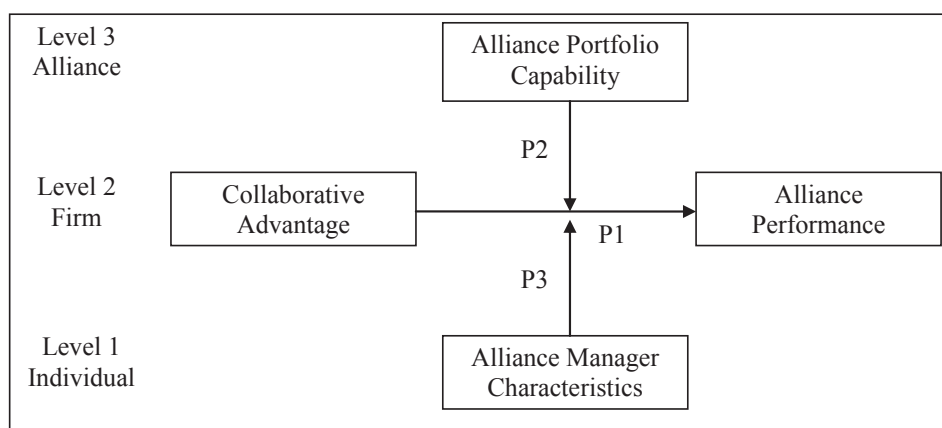


Figure 3. Example of multilevel modeling of alliance performance with moderators from levels above and below.

A particular type of multilevel model is concerned with patterns of relationships replicable across levels of analysis. Such models reflect relationships at one level that are generalizable to other levels (i.e., constructs and their relations are presumed to be meaningful across levels). In interfirm research, specification of few such constructs is evident; though researchers often treat (implicitly) a number of constructs as if they have

such generalizable properties (e.g., trust). Collaborative advantage is a particularly ambiguous construct in terms of levels of theory and analysis, and not specifying how collaborative advantage translates from the organization to the interfirm relationship and beyond clearly may blur the theoretical development and empirical analyses. As pointed out earlier, certain aspects of collaborative advantage may reside within the organizational boundaries, whereas others may be a function of relational interaction with alliance partners or indeed industry structure and competition.

While the underlying assumption is that collaborative advantage characteristics are similar across analytical levels, very few studies specify and measure the extent to which the processes leading to firm-level collaborative advantage mirror those that lead to interfirm collaborative advantage, thereby increasing the risk of committing a “cross-level fallacy” (Rousseau, 1985, p. 5). For instance, according to the RBV, firms are bundles of resources, and competitive advantage results from the effective management of internal resources (Barney, 1991). Because resources are distributed heterogeneously across firms, this perspective shows that some important internal resources can be obtained from external sources via alliances; however, such theories largely neglect to stipulate the mechanisms by which firm-level resources can affect and be affected by exchanges between complex social systems, such as organizations. Such mechanisms are likely to influence the extent to which collaborative advantage, conceptualized and measured at the firm level, can be generalized to higher or lower levels.

## Concluding Discussion

The vague and unclear status of the notion of collaborative advantage and related concepts formed the basis of this paper. As is often the case with fuzzy concepts in social science, collaborative advantage captures relevant and important phenomena. Accordingly, the purpose of the paper was to proffer a clarification of the construct, attempting to define the meaning of collaborative advantage as an inherently and inescapably multilevel phenomenon, whose potential value rests on the theoretical and methodological clarity and rigor of the researchers applying the construct. If an elusive and ambiguous construct such as collaborative advantage is to become useful in management and social science research, adequately defining its theoretical borders, the scope conditions, semantic relationships to other related constructs, and the logical consistency of argumentation is necessary (Suddaby, 2010). Given the multilevel nature of collaborative advantage, one must align levels of theory, measurement, and analysis to ensure construct clarity and avoid model misspecifications and empirical misinterpretations. Specifically, one must pay careful attention to the level of theory to which multilevel constructs, such as collaborative advantage, belong and determine to what extent relationships among variables generalize across levels *before* data collection and statistical analysis. Hence, future research on collaborative advantage should involve addressing the fundamental issues of defining and clarifying the construct in terms of levels of theory, measurement, and analysis as outlined in this paper.

Such definition and clarification are particularly pertinent, given a certain amount of levels confusion in the literature: presumably because of its general and intuitive appeal (i.e., any advantage to any actor that arises through collaboration), stakeholders have treated collaborative advantage as an unproblematic construct applicable to almost any level of analysis (from collaborating individuals to collaborating nations). However, many researchers apply collaborative advantage to levels where it may not make conceptual or logical sense. This paper included questioning the sense of ascribing collaborative advantage to a national system of innovation, for example. More fundamentally, the paper indicated that people should take extreme care when applying constructs developed for one level of theory to another because the underlying causal mechanisms may differ when traversing levels.

Despite a long history of recognizing that organizational phenomena unfold within complex and dynamic systems, management research and organizational science stakeholders often ignore the multilevel dynamics of these social systems. The system typically reflects industry-, alliance-, organization-, team-, and individual-level subparts, each part the providence of different disciplines, theories, perspectives, and approaches. As a result, coherent research on organizational phenomena as integrated systems spanning multiple levels of theory, measurement, and analysis is scarce, constituting a critical omission in the progression of organizational and management science.

This paper reflected an outline of important multilevel issues pertaining to research on collaborative advantage. The aim was to highlight fundamental issues of construct clarity in relation to collaborative advantage, such as the issues of specification of levels of theory, measurement, and analysis. The importance of adequately

defining the meaning of the collaborative advantage construct and of determining the profound implications of adequately specifying the nested structure of the collaborative advantage phenomenon is clear. Multilevel research—research on the extent and correlates of variability in both antecedents and consequences of collaborative advantage at multiple levels—holds great promise for advancing this area of research. Although this paper included a series of methodological warnings and mild criticism of a tendency to transfer constructs indiscriminately (and claims about causal mechanisms) across levels of theory or analysis, multilevel research on collaborative advantage offers significant potential for interesting future research questions. In particular, researchers should focus on potentially novel explanatory mechanisms and independent variables at different levels. For example, in the context of alliance research, considering variables typically addressed in the national innovation systems literature, such as specific national policies and institutional arrangements, may be quite useful. Such variables must be theoretically specified (in the sense of accounting for their moderating, mediating, or direct impact on collaborative advantage) and empirically modeled (in the sense that the level of measurement matches the level of analysis).

A final warning regarding future research on collaborative advantage is necessary: despite the intuitive appeal of collaborative advantage, researchers must better ground the construct theoretically to realize its potential as an informative social science construct. Such theoretical grounding may start with construct clarification but should move beyond pure descriptive properties to include considerations of how (the relationship to other constructs), when (the contextual conditions), and why (the causal mechanisms) related to collaborative advantage matters (Bacharach, 1989). Multilevel theorizing may be a vehicle to help clarify the boundaries, contingencies, and interdependent nature of collaborative advantage and to advance research.

## Endnotes

- 1 Small-N research often exhibits the classic many variables–small sample size problem (i.e., the number of potential variables in a research model exceeds the number of observations). However, small-N research has distinct advantages in certain contexts, such as ethnographic and historical inquiry, where causality is complex and the number of cases is inherently small (Abell, 2004).
- 2 The huge success of the strategic management field indicates that fields can flourish even in the presence of considerable conceptual ambiguity. Thus, one should not view conceptual clarity as a *necessary* condition of scientific progress. However, the counterfactual argument may be that the strategic management field (or other fields and disciplines that have fuzzy concepts at the heart of their analytical enterprise) may have progressed even more had it adopted clearer key constructs earlier. The same applies in the case of collaborative advantage.
- 3 Internet searches did not reflect earlier uses of the construct.
- 4 This is not to say that no grand theory in organizational theory exists. Clearly, transaction cost economics reflects such aspirations (Williamson, 1996).
- 5 Note that firms themselves are nested in contextual environments, which may differ from the industry or country of the alliance. However, for simplicity, such complex cross-classified nesting does not form part of this illustration.

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