

Operational competencies and relational resources: a multiple case study

Operational
competencies

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Abstract

Purpose – The purpose of this study was to use relational vision as a theoretical support for an investigation of how operational competencies are developed from the interaction of shared relational resources in the supply chain and to verify how these competencies allow the resources to be able to function, unity, integration and direction.

Design/methodology/approach – This multihull study was based on semi-structured interviews with 13 representatives of four dyads from companies in the steel, automotive and industrial applications, pulp processing and manufacturing and application of flexible tubes.

Findings – The results indicate that information, knowledge and learning are significant constructs to influence the development of operational skills in the supply chain because they represent the ability of the company to promote skills to efficiently use resources and create a barrier to imitation.

Research limitations/implications – There are limitations in the use of four companies from different industrial segments because it is possible to generalize the results. However, given the cross-sectional nature of the research, new studies may adopt a longitudinal approach to verify the evolution in the area of operations. Future studies may also expand the unit of analysis to understand the role of the relationship between the focus business and its strategic suppliers from the viewpoint of the suppliers.



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Thus, new research can be expanded to dyads, triads and business networks by investigating the various stages in the supply chain.

Practical implications – This study contributes to the literature and adds the dimension of relational operational skills, which is hitherto little explored in previous studies.

Social implications – This study contributes to the literature in the area of operations management, in collaborative relationships between buyers and sellers, focusing on the relational view of competitiveness.

Originality/value – The growing importance of organizations and the role of collaboration, based on mutual benefits and grouping of skills, tend to increase the competitive benefits of companies operating in this context. The management of this type of arrangement becomes a challenge for researchers, reinforcing the originality of this study.

Keywords Supply chain, Operational competencies, Operations management, Collaborative relationship, Resource-based view, Relational view

Paper type Research paper

Introduction

In the field of operations management from the 1960s to the 1980s, operational strategy studies were developed with a focus on the development of skills and new technologies and the more efficient use of resources (Amit & Schoemaker, 1993; Barney, 1991; Barney & Clark, 2007; Barney & Hesterly, 2011; Barney, Ketchen, & Wright, 2011; Collis & Montgomery, 1995; Grant, 1991; Wernerfelt, 1984).

With the advancement of business competitiveness, an understanding of how internal resources can function effectively for organizational strategy began to be reached in the 1980s, with investigations that have broadened the field of studies on internal resources advocated by the shift from the resource-based view to the relational view of strategy, focusing on dyads, triads, strategic alliances and networks (Dal Bó, Milão, & Toni, 2018; Dyer & Singh, 1998; Lavie, 2006; Nyaga, Whipple, & Lynch, 2010).

In highly competitive markets, the intensification of competition over recent decades has led to the emergence of various theories, e.g. the relational view of strategy and the recognition of the value of collaborative relationships, to leverage resources and knowledge among partners as an important response strategy to changing environments (Cao & Zhang, 2011; Dyer & Singh, 1998; Narasimhan, Swink, & Kim, 2005; Voss, 1995) and to increase relational profits (Combs & Ketchen, 1999; Das & Teng, 2000; Dyer & Singh, 1998; Ingham & Thompson, 1994; Mesquita, Anand, & Brush, 2008).

In this context, the relational view enables one to affirm that relational resources promote the development of operational competencies and productivity gains (Asanuma, 1989; Dyer, 1996; Dyer & Singh, 1998). However, recent studies such as that by Wu, Melnyk, and Flynn (2010) bring together resources and competencies from the company's internal perspective, leaving gaps in the literature on relational resource sharing and the development of operational competencies, with strategic implications for the proper allocation of resources that can result in superior performance (Wu, Melnyk, and Flynn, 2010; Wu, Melnyk, & Swink, 2012).

Considering these shortcomings in literature, this paper intends to answer the following research question:

RQ1. Do relational resources promote the development of operational competencies?

Thus, this study aims to identify and analyze how operational competencies are developed from the interaction with the relational resources shared in the supply chain, as operational competencies are the ones that give unity, integration and direction to the resources, determining how they can be used more efficiently to physically transform inputs into outputs (Wu et al., 2010).

Theoretical foundation

Resource-based view

Competitive advantage is an important concept in the field of business strategy (Gohr, Santos, Burin, Marques, & Arai, 2011; Penrose, 1959). There is a consensus in the resource-based view theory that this advantage is obtained by companies from the possibility to accumulate tangible and intangible resources – brands, technological knowledge, machinery, plant, and personnel skills, etc. – and create additional economic value over their competitors (Amit & Schoemaker, 1993; Barney, 1991; Carvalho, Prévot, & Machado, 2014; Collis & Montgomery, 1995; Grant, 1991; Wernerfelt, 1984).

Relational view

The relational view (Dyer & Singh, 1998), and the vision based on extended resources (Lavie, 2006; Mathews, 2003), complements the traditional resource-based view. The relational view argues that a company's internal resources can be combined beyond its borders, extending the unit of analysis to a network that creates additional relational revenues developed from the partners' unique qualities (Cao & Zhang, 2011; Dyer & Singh, 1998).

The relationship is, for the partners, a resource of competitive value, because it develops informational principles and a reputation for new collective actions (Balestrin & Zen, 2010; Cardeal & Antonio, 2012; Dyer & Singh, 1998; Gulati, 1999; Gupta, Tan, Lee, & Chen Phang, 2018; Balestrin, Verschoore & Perucia, 2014; Zacharia, Nix, & Lusch, 2011). Thus, the relational view is guided by the adoption of collaborative relationships and practices among members of the same network, resulting in the creation of value and superior performance for each party and the relationship as a whole. There are four sources of income in this sort of relationship: investments in specific relationship assets, knowledge sharing routines, resource complementarity, and governance (Combs & Ketchen, 1999; Dyer & Singh, 1998; Lavie, 2006; Mesquita, Anand, & Brush, 2008).

Operational competencies

It is necessary to emphasize that resources alone only define the potential that an activity may have to lead to better performance as resources depend on operational competencies being used efficiently. Operational competencies represent the ability of the company to promote skill sets (Hayes & Wheelwright, 1984; Laugen, Boer, & Frick, 2005; Voss, 1995) and achieve a sustainable competitive advantage (Wu et al., 2010).

Operations management studies that have made important contributions in the theoretical field of competitiveness have focused on the concepts and practical applications of operational competency (Hayes, Pisano, Upton, & Wheelwright, 2008; Santos, Gohr, & Varvakis, 2011; Swink, Narasimhan, & Kim, 2005; Voss, 1995; Wu et al., 2010), as well as considering how operational competency acts as a strategic function for the improvement of processes (Tan, Kannan, & Narasimhan, 2007; Wu et al., 2010), creating primary income (Barney, 1991; Penrose, 1959; Peteraf, 1993; Wu et al., 2010).

Operational competencies are defined in the operations management literature as the ability to exploit resources efficiently (Bromiley & Rau, 2014; Flynn, Huo, & Zhao, 2010; Hayes et al., 2008; March, 1991; Nonaka, 1994; Wu et al., 2010), to carry out the basic functional activities of the company (Collis, 1994) and to troubleshoot and perform daily activities (Pavlou & Sawy, 2011; Winter, 2003). Operational competencies act through learning, process refinement, skills and incentives to repeat, leverage and sustain previous successful experiences (Martin, 2011; Wu et al., 2010) as a result of the use of resources and practices that enable the efficient performance of activities (Paiva, 2017).

Wu et al. (2010), based on the study by Swink and Hegarty (1998), developed a taxonomy of six operational competencies in the context of product differentiation. Their objective was to provide a theoretical framework to guide the operationalization of operational competencies:

- (1) *Operational improvements*: These include the incremental enhancement and reinforcement of current operational processes that can contribute to the organization's innovation (Peng, Schroeder, & Shah, 2008; Swink & Hegarty, 1998).
- (2) *Operational innovations*: These include radical improvements in existing operational processes or the creation of new unique processes (Peng et al., 2008; Swink & Hegarty, 1998).
- (3) *Operational customizations*: These include knowledge creation and the customization of operational processes (Schroeder, Bates, & Junttila, 2002; Wheelwright & Hayes, 1984).
- (4) *Operational cooperation*: This includes the skills to develop stable relationships with internal functional areas and supply chain partners (Droge, Jayaram, & Vickery, 2004; Escrig-Tena & Bou-Llusar, 2005; Swink & Hegarty, 1998).
- (5) *Operational response capability*: This is the rapid reaction and easy adaptation to internal and external changes (Swink & Hegarty, 1998; Upton, 1994).
- (6) *Operational reconfiguration*: This includes the skills to perform the transformations necessary to restore the operations strategy as a result of environmental contingencies (Pandža, Polajnar, Buchmeister, & Thorpe, 2003; Swink & Hegarty, 1998; Teece, Pisano, & Shuen, 1997).

Collaborative supply chain relationships

Changes in the dynamics of markets and organizations in recent years have motivated studies that advocate the need for inter-organizational collaborative relationships (Bronzo, 2004) that become increasingly deeper and are based on trust, deep social interactions, communication, information and knowledge for the appropriation of relational incomes (Combs & Ketchen, 1999; Dyer & Singh, 1998; Lavie, 2006; Wu et al., 2010; Zatta, Mauri, Freitas, Goncalves, & Mattos, 2018). These relationships are encouraged because the synergies that are developed generate benefits superior to those generated by a company on its own (Cao & Zhang, 2011; Dyer & Singh, 1998; Wu et al., 2010). In addition, ever-deepening relationships stem from the competitive environment (Wu et al., 2012), which increasingly requires companies to engage in value activities in each other's business processes (Cao & Zhang, 2011; Chen & Paulraj, 2004; Cooper, Lambert, & Pagh, 1997).

In the supply chain, the relevance of the relationship stems from the increasingly global processes with which companies are looking for more effective ways of coordinating the flow of materials (Zacharia et al., 2011) while improving their operational performance and competitive advantage. In this situation, there might be positive gains for the parties, enabling the competition with other chains (Cao & Zhang, 2011; Lummus & Vokurka, 1999; Rungtusanatham, Salvador, Forza, & Choi, 2003; Tan, 2002).

Collaboration involves the sharing of information, communications, risks, synchronized decisions, congruent objectives, the alignment of incentives, the creation of new knowledge, the reduction of costs and response times, effectiveness and the co-development of resources, skills and innovation (Bowersox & Closs, 2001; Burgess, Singh, & Koroglu, 2006; Cao & Zhang, 2011; Chen & Paulraj, 2004; David & Stewart, 2008; Dyer & Singh, 1998; Gulati, 1999; Hardy, Phillips, & Lawrence, 2003; Jap, 2001; Krause et al., 1998; Rao, Phillips & Johnson, 2006; Singh & Koroglu, 2006; Vangen & Huxham, 2003).

Research framework

To analyze the development of operational competencies, the proposed research model was anchored in the main constructs of the relational resource theory (Dyer & Singh, 1998) regarding the companies in the supply chain and in the constructs of operational competencies (Vasconcelos & Cyrino, 2000; Wu et al., 2010). The relational vision model was adopted to provide the basis for an analysis of how shared relational resources in dyads promote the development of operational competencies.

Considering the relationship between buyers and sellers, the dynamics of competitiveness refers to strategic actions undertaken to increase a competitive advantage, which is possible due to the shared resources, emphasizing that the resources alone define the potential to perform certain activities, and that the resource-based competitive advantage could be restricted to a small number of companies (Frega, Lemos, & Souza, 2007) (Figure 1).

Level of analysis	Unit of analysis	Purpose of the analysis
Interorganizational	Networks and dyads of firms as the unit of analysis to explain relational rents (in the supply chain)	To identify and analyze how the development of operational competencies occurs, focusing on the relational view and the interaction of shared resources in supply chains

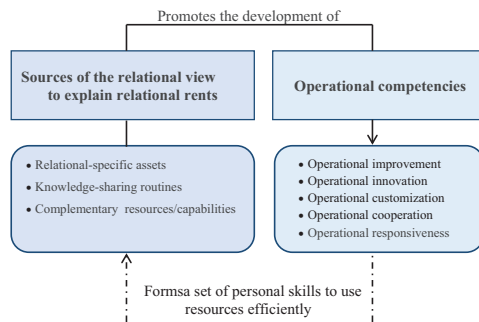


Figure 1.
Research framework

Research methodology

With the objective of identifying and analyzing the relationship between relational resources and the development of operational competencies for the different members of supply chains, the present study adopted the methodology of a study of multiple interpretative cases (Miguel, 2010; Yin, 2010) and is characterized as descriptive and exploratory (Cervo & Bervian, 2002; Collis & Hussey, 2005; Gil, 2010). In Brazil, a case study is a research method commonly used in production engineering and operations management (Miguel, 2010; Nakano, 2010), with relevant results in the administration of production and operations (Meredith, 1998).

Definition of the sample

The qualitative empirical multiple case study consisted of in-depth interviews conducted with managers responsible for the relationships in the dyad of strategic buyers and suppliers, from the perspective of the buyers, but the theoretical constructs investigated herein evidenced the initiatives enabled by the link and the nature of the relationship (Chen & Paulraj, 2004).

Distinct sectors and companies were chosen with the aim of identifying particular issues in each case related to the phenomenon being investigated and making comparisons between cases (Eisenhardt, 1989; Meredith, 1998). The sectors and companies were defined according to their particular features, their strategic position in the Brazilian and international scenario, their competitiveness on a worldwide basis, employability and the income and taxes they generate. A total of four sectors were surveyed:

- (1) a company in the steel sector, present in 60 countries (Alpha);
- (2) a company in the automotive and industrial sector that is a global leader (Beta);
- (3) a cellulose processing company (Gamma); and
- (4) a global leader in the underwater technology sector (onshore, offshore and surface) (Delta).

Data collection

Data were collected using semi-structured interviews (Collis & Hussey, 2005; Grötsch et al., 2013; Lockstrom et al., 2011; Miguel, 2010), validated and pre-tested by academics and specialists in the areas of operations management and supply chains.

The first block, with six questions, characterized the profile of the company's strategic suppliers. The second block, again with six questions, concerned the collaborative relationship between the company and its strategic suppliers. The third block, with 17 questions, related to relational resources and operational competencies.

Responses were collected from 13 specialists: supply superintendents, supply chain managers and specialists in logistics, procurement, planning and control, process engineering, human resources, operation and quality (Collis & Hussey, 2005). The interviews lasted, on average, about 1 h 40 min, and the total duration of the interviews was 8 h 20 min. Two rounds of interviews were held for Alpha and three for Beta.

Data analysis

The data were analyzed, first, through individual analysis and, later, through cross-comparative and case analysis. The content analysis method was adopted (Bardin,

2007) for the treatment of the data collected in the research (Collis & Hussey, 2005). The analysis included the general analytical procedure with techniques of interpretation and codification to transform text into numerical variables. Operationally, the content analysis was performed in the pre-analysis, material exploration or coding stage and as part of the processing and interpretation of the results obtained (Minayo, 2007). The methodological quality of the research was established by looking at the criteria of reliability and the validity of the observations and points of attention (Miguel, 2010; Yin, 2010).

Results and discussion

The qualitative evaluation of the value activities of the companies present in the sample, in which the strategic suppliers were involved, comprised an investigation of the characteristics of the suppliers and their collaborative relationship with the companies in the sample (Table I).

The activities with the greatest convergence value in the cases investigated were the development of new products and quality management. For Alpha and Gamma, other activities with high convergence value were the joint execution of production and inventory management, and for Beta and Gamma, such activities included the management of deadlines for the delivery of raw materials. It was evident that a collaborative relationship has significant explanatory capacity in relation to the sharing of information and knowledge.

One aspect of the characteristics of the relationships (Table II) was that, although the predominance of long-term relationships with a few suppliers can be seen, purchases of raw materials were made under formal contracts because the criticality and dependency of these resources were crucial for the business. For example, Alpha used mineral commodities to ensure lower price volatility, as in the international market purchases are anticipated up to two years before the delivery date. Delta formalized long-term contracts for multi-year periods (three years) through an advanced pricing policy. Gamma had formal contracts for the acquisition of standing eucalyptus forests in the national market.

It was also shown that collaborative activities were diversified, and that the supply structure was guided by mixed governance mechanisms. Relational mechanisms were present more often as they presume agreements based on processes and social norms, rather than a transactional mechanism structure for market governance that presumes formal contracts with clauses and obligations to be fulfilled (Poppo & Zenger, 2002).

Alpha	Beta	Gamma	Delta
<i>Value-based business activities in which strategic suppliers are involved</i>			
Steel industry	Automotive applications	Pulp processing	Flexible tubes
Product development and process improvement	Development of new products		
Planning and production		Joint production	
Storage processes	Order tracking	Inventory management	
Packaging processes	Management of lead-time of work-in-process in manufacturing	Management of lead-time of work-in-process in manufacturing	
Distribution logistics			
Quality systems			

Table I.
Value-for-money
business activities

Table II.
Characteristics of
collaborative inter-
organizational
relationships

	Alpha	Beta	Gamma	Delta
Companies/features	Steel industry	Automotive applications	Pulp processing	Flexible tubes
Supplier selection method	Proximity, financial strength, quality, term, cost, technology			
Transactional mechanism (Formal contract)	Purchase of raw materials			
Collaborative assumptions to share high levels of interaction and involvement	Predominantly long-term relationships			
	Reliable relationships			
	Collaboration			
	Collaborative communication			
	Joint learning			
	Interpersonal relationships and managers involved			
	Suppliers involved in value activities of the business			
	Transfer of personnel (unilateral)	Transfer of specialized personnel (bilateral)		
	Integration into the supply chain			
Relational resources	Investment in specific assets	–	Investment in specific assets	–
	Information exchange			
	Shared knowledge			
	Complementary resources			

The most commonly used shared relational resources were investments in specific assets made by strategic suppliers in Alpha and Gamma, the exchange of information and knowledge and complementary resources. In Alpha, the investments were made unilaterally by the suppliers. The results indicate that other relational mechanisms were more commonly present in the Alpha and Gamma companies, evidencing that in the steel and pulp sectors, the players are more likely to share resources. This can be linked to other aspects, such as the size of the companies, financial strength and the ability to interact with the international market. The main characteristics of the relationships identified:

- the method of selecting strategic suppliers;
- orientation regarding the term of the relationship;
- trust;
- interpersonal relationships;
- manager involvement;
- collaborative communication;
- sharing of tangible and intangible resources; and
- operational proximity.

The interviews revealed that the involvement and engagement of senior managers was the key success factor of the relationship, especially in informal negotiations.

We identified that operational proximity and a long duration of the relationship generate greater trust among partners, create knowledge and operational skills to support internal processes and external relations and develop relational operational competencies (Amit & Schoemaker, 1993; Dierickx & Cool, 1989; Wu et al., 2010).

Relationships between the companies in the sample and their strategic suppliers

In the supply chain, the relationship arises from the characteristics of the collaboration and the level of involvement of the partners: the relationship may be deep (having relational characteristics) or superficial (having transactional characteristics). The data presented herein showed relationships with mixed characteristics but indicated that the relational ones had stronger intensity. Transactional relationships were in place to avoid possible interruptions in the supply of raw material.

It was evident that the relationships between the companies of the sample and their strategic suppliers had deep levels of partnership in which the partners worked together to carry out common activities (Grant & Baden-Fuller, 1995).

Characterization of the shared relational resources and operational competencies developed

This section considers the value activities of the companies of the sample in which strategic suppliers were involved (Table I), the characteristics of the collaborative relationships (Table II) and the patterns of the relationship between the companies and their strategic suppliers, as discussed in the previous subsection. Two important categories are highlighted.

The relational resources between the sample companies and their strategic suppliers can be categorized into the following classes: investments in specific assets; substantial exchange of knowledge and learning; and complementary resources, skills and abilities; this was done for the joint creation of new or exclusive products, services or technologies.

Operational competencies comprise the following: operational improvement, operational innovation, operational customization, operational cooperation, rapid response to the market and operational reconfiguration. However, the last area was not investigated in this study.

The results point to shared relational resources in the supply chain that develop operational competencies:

- Investment in specific assets, made unilaterally by strategic suppliers, in infrastructure, industrial plants, facilities and equipment (Alpha) and joint investment with suppliers in infrastructure, industrial plants, equipment, technology, brands and patents and financial and human resources (Gamma);
- Exchange of information on purchases, consumption of raw materials, deadlines and value activities (Alpha); on supply chain performance, product improvement, cost and quality standards (Beta); on supply chain performance, production, planning, timing and value activities (Gamma); and on the performance of the supply chain, production, and value activities (Delta);
- Knowledge sharing about ways to use materials, operate equipment, improve processes and customize and develop new products (Alpha, Beta, Gamma and Delta); and
- Complementary resources for the development of transport and logistics systems, raw material delivery, technical assistance, research and development and inter-

organizational alignment to harmonize systems and processes (Alpha, Beta, Gamma and Delta).

The related operational competencies developed were as follows:

- *Operational improvement*: This involves continuous improvement, elimination of waste, recycling of waste, reduction of inventories and set-up, new working methods and technical knowledge (Alpha); control of process variability, technological improvements, standardization of processes, cost reduction, quality, flexibility and technical knowledge (Beta); reduction in inventories and setup, new working methods and technical knowledge (Gamma); and technical knowledge, new technologies, efficient utilization of raw materials and receipt term management (Delta). All the companies adopted continuous improvement processes, as well as Six Sigma, Just in Time and TQM tools.
- *Operational innovation*: This involves development of new processes and products for specific customers (Alpha); development and testing of new products, systems and processes and laboratory simulation methods (Beta); new technologies and product and process development (Gamma); and development of experiments, tests, error tolerance analysis and product qualification (Delta).
- *Operational customization*: This involves development of new equipment, adaptation of planning systems, modification of processes for specific customers (Alpha); development of products to meet the requirements of specific sectors and knowledge and learning (Beta); new manufacturing processes for production flexibility (Gamma); and product development according to customer specifications, product application testing and computer simulation (Delta).
- *Operational cooperation*: This involves having information to carry out operational activities, joint decision-making to solve supply chain problems, sharing information to deal with uncertainties and resolving inter-organizational and inter-organizational conflicts (Alpha, Beta, Gamma and Delta).
- *Rapid response to the market*: This involves having information to meet production orders, manage demand fluctuations, adjust production capacity, inputs, labor and equipment and change process flow paths (Alpha, Beta, Gamma); and sharing information to meet production orders, manage resources and stream production to volume flexibility (Delta).

It is possible to emphasize that the information and knowledge constructs already discussed herein generate learning from the joint performance of routines and operational practices as key factors in the development of experience and specific skills in the relationship. Information facilitates collaborative activities, creates organizational and operational knowledge and promotes the development of new skills. Knowledge develops innovation capacity, reduces the learning curve, and promotes higher innovation rates for companies that share learning information regularly.

To enter into a relationship, strategic suppliers must have expertise in product and process technology, customized solutions, automation, flexibility, quality, cost and large-scale technological innovation capability to meet specific customer needs. They must avoid process variability and prevent defects, in addition to having trained

personnel and transferring personnel to enable improvements and changes in practices and processes to develop new products and align cultural differences, avoiding problems in the relationship.

Conclusions, limitations and implications for future studies

The purpose of this study was to identify and analyze how operational competencies are developed from the interaction of shared relational resources. The study was carried out in four supply chain dyads. According to the interviews, the companies developed relational synergies with their strategic suppliers, adopting operational competencies for the efficient use of resources. Notably, the companies used resources and skills to contribute to the relationship strategy to obtain greater relational income for the individual companies and the chain as a whole. Collaborative relationships are relevant because they enable the members to use integrative strategies to influence the development of competencies to create competitive advantage. It can be inferred that the relational approach promotes advances in which companies co-evolve from an initial and reactive stage to a stage of constant and shared learning, creating relational skills, changing their existing standards from an internal to a relational perspective, without harming the relationships among them, and seeking the maximization of the relational results in the long term.

Evidence of the development of operational competencies is reinforced by the relevance of information and knowledge constructs for orientation and adaptation in an environment of change and high competition through the use of collective skills to solve problems in the relationships between members. The exchange of information and knowledge is especially notable for its presence in the various relational mechanisms that radiate through the interrelated organizations.

It is worth noting that the study contributes to the theory of operations management concerning inter-organizational relationships, as it advances the field of relational view, highlighting the adoption of relational and integrative strategies, as well as broadening the competency literature debate.

There are limitations in the use of four companies from different industrial segments because it is not possible to generalize the results. However, given the cross-sectional nature of the research, new studies may adopt a longitudinal approach to verify the evolution in the area of operations. Future studies may also expand the unit of analysis to understand the role of the relationship between the business and strategic suppliers from a supplier's perspective. Thus, new research can be expanded to dyads, triads and business networks by investigating the various stages identified in the supply chain.

Nevertheless, in addition to the opportunity for future research, the conclusions of this study show that each theoretical approach is still only partially explored, thus opening up research gaps where answers are lacking and bringing new light to studies and practical applications. It should be emphasized that research on themes involving relational resources and operational skills, like the theme approached herein, is still at an early stage.

In addition to broadening the theoretical discussion as described above, the study offers a central contribution to dyads by investigating the process of operational performance through the use of relational resources.

Although these results are based on four organizational realities, they are not generalizable, and an exploration of the use of relational resources to compare the development of operational competencies is suggested. The taxonomy could, for example, be explored in different contexts, such as other segments or sectors.

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