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The *tertius* roles in a coopetitive context: The case of the European aeronautical and aerospace engineering sector

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Summary How can coopetition between rival firms be created and supported, given the risks of opportunism inherent to the coopetitive context? The literature on *tertius gaudens* (the third-actor who benefits from the others) and *tertius iungens* (the third who joins) provides some answers to this question. Using an abductive approach based on grounded theory, we sought to describe these *tertius* roles in the coopetitive process. We conducted 58 structured interviews in 37 organizations in the European aeronautical and aerospace engineering sector. We identified two main classes of third actors who play intermediation roles: decision-makers and go-betweens. Each competitor in the supply chain is managed in accordance with the third-actor profile.

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Introduction

Coopetition describes situations of concomitant competition and cooperation between rival firms (Brandenburger & Nalebuff, 1996), usually within complex networks (Peng & Bourne, 2009). The field of coopetition has become more visible since the major contributions of Brandenburger and Nalebuff (1996). These authors emphasized the following question: if business is a game, who are the players and what are their roles? Indeed, many actors interact during the coopetitive process, but they have different roles as: customers, suppliers, complementors, and so on.

If business is indeed a game, it is played on numerous levels (Dagnino & Padula, 2002; Tsai, 2002) and multifaceted coopetition (Dowling, Roering, Carlin, & Wisniecki, 1996) only complicates business relationships. For example, a supplier and a customer can compete for the same services or products. The industrial world has many examples of coopetition, especially in high-tech areas. Motorola is seen by rivals as a competitor, customer or supplier. Sony and Philips are competitors but work together to develop norms and standards (Hamel & Prahalad, 1994). Ericsson, Motorola and Nokia cooperate to develop infrastructures for the telecom industry in China but, at the same time, negotiate with the Chinese government separately for greater market access (Luo, 2007). These examples show that, because coopetition occurs among many actors at different levels of the supply chain (Chin, Chan, & Lam, 2008; Dagnino &

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Padula, 2002; Luo, 2007; Luo, Stotegraaf, & Pan, 2006; Osa-renkhoe, 2010; Pathak, Day, Nair, Sawaya, & Kristal, 2007; Peng & Bourne, 2009), it adds a degree of complexity that needs to be carefully managed. Dagnino and Padula (2002) propose a typology of coopetition according to the number of firms involved and the number of levels in the value chain. Gnyawali, He, and Madhavan (2008) distinguish horizontal from vertical coopetition and then dyadic relationships from network relationships.

We have observed a gap in the literature regarding how coopetition is created and how the coopetitive process can be reinforced. Yet, it is extremely important to be able to create the right conditions to favor coopetition. Therefore, it is difficult for firms to manage two seemingly incompatible situations at the same time: competition and cooperation. If the tensions between competition and cooperation are not carefully managed, they will generate problems in the creation of cooperation with a competitor or the consolidation of cooperation with a potential partner because of the high risk of opportunism.

Trust is the foundation for cooperation between competitors (Doz, 1996; Ritala & Hurmelinna-Laukkanen, 2009; Yan & Gray, 1994). According to the game theory (Rapoport & Chammah, 1965), the introduction of a third actor to the decision-making process encourages trust and reduces the risk of opportunistic attitude. In this research, we sought to identify the third-actor behavior related to an intermediation role that favors coopetition. These actors are not directly involved in the coopetitive process as competitors.

The aeronautical and aerospace engineering sector is well suited for studying cooperation between rivals (Dussauge & Garrette, 1995). First, the actors in this industry are highly concentrated and some of them dominate markets and play the role of hub firms (Kechidi & Talbot, 2010). Second, the large prime contractors (the main companies in charge of industrial development) focus on their core business, specializing in blocks of specific skills, and seek to decrease costs. For example, two prime contractors which are competitors, Astrium and Thales Alenia Space, often cooperate in order to gain asset complementarities. Third, this sector is particularly relevant for analyzing coopetition at multiple levels of the supply chain. Thus, it is based on a subcontracting model that has shown ongoing change since the 1980s (Kechidi & Talbot, 2010). Currently, the companies from this sector are based on modular architecture (Frigant & Talbot, 2005). Fourth, this sector is a source of conflict in the northern hemisphere because many countries seek to invest in this industry (strategic trade policy).

International competition and strategic issues of coopetition involve public-sector actors in the coopetitive game in playing the role of third actors to improve the performance of domestic firms. Moreover, they contribute to creating an atmosphere of trust between supply chain actors. For instance, economic institutions such as the European Space Agency (ESA) and the French National Space Research Centre (CNES) encourage all firms (large firms, SMEs, etc.) to coopetite and support shared projects originating from firms responding together to an invitation to tender. This intermediation is also fostered by the European Union and is called "the geographical return rule". For example, a European country which contributes financially to an industrial aerospace programme supervised by the European Un-

ion is supposed to obtain business from this programme for its domestic firms. Consequently, focusing on intermediation in the aerospace industry is highly relevant because European public actors want to make rival European firms work together to win in the global competition against American competitors and more and more against emerging country competitors.

In the first section of this paper, we describe the theoretical background for our research, with a focus on the literature concerning *tertius gaudens* (Simmel and Wolff, 1950; Burt, 1992) and the emergent literature regarding *tertius iungens* (Garriga, 2010; Obstfeld, 2005); that is, the third actor who is able to make actors cooperate. We then show the two *tertius* strategies that favor coopetition which naturally leads to our principal research question: what are the *tertius* roles in a coopetitive context?

In the second section, we outline our methodology. The sample is composed of 37 firms and our data set consists of 58 structured interviews with the CEOs or top managers. We used an abductive approach (Strauss & Corbin, 1998) to study the role of *tertius* in the coopetitive process. We assumed that the *tertius* literature provides a basis for exploring coopetition and how to facilitate cooperation between competitors. However, our research question is quite new in our field and there is a need to structure the theory. Consequently, we used a method that involves the open encryption of these interviews in order to show aggregated categories (Locke, 2001).

The findings are presented in the third section. We identify two main classes of third actors who play intermediation roles linked with the two *tertius* strategies: "decision-makers", who are customers and prime contractors, and "go-betweens", who are public agencies or research centres. All of the actors in each class have specific functions, and coopetition is thus managed according to the *tertius* profile.

In the final section, we discuss our findings in the context of other works and then summarize the main points. We review the contributions and limitations of our work, offer suggestions for future research, and conclude with a description of our ongoing research.

Theoretical background

Intermediation in a coopetitive context

The literature on supply chains assumes that coopetition is a complex phenomenon. For instance, Dowling et al. (1996) propose a multifaceted approach to coopetition. They consider that coopetitive situations emerge at different levels for firms (Dowling et al., 1996; Tsai, 2002), and they have identified the direct and indirect forms of competition that lead to different forms of cooperation and, consequently, to different forms of coopetition. Peng and Bourne (2009) studied two healthcare networks in Taiwan and identified how the networks interact at different levels. The healthcare networks compete for customer markets, technology, cost efficiency and public influence, but cooperate for patient referrals, joint training and education, and the sharing of unique health resources. Thus, depending on the step in the value chain, these hospitals are competitors or

cooperators at different organizational levels. To encourage successful cooperation between the healthcare networks, the Taiwanese government launched several programmes, especially the Healthcare Network Plan, to compel the healthcare networks to work together. Thanks to this intervention, the cooperation process has created synergies between the networks. Without government intermediation, cooperation would most likely not have been possible because of the threat of opportunism. This study thus shows that public institutions that function as third actors in order to develop cooperation among competitors can successfully instigate the cooperative process.

According to the literature, customers can also play an intermediation role between competitors. Rival suppliers are generally free to choose to cooperate with each other or not; however, customers can use their influence to force them to cooperate. The customer can be from the private sector, such as the prime contractor, or from the public sector (Mariani, 2007), but both forms are able to make cooperative relationships emerge.

A theoretical framework is required to more fully understand the intermediation roles of third actors in the cooperative process. We therefore propose to use social network theory to study these roles. Social network theory, and especially the structural approach (Burt, 1992), is suitable for understanding linkages between people and between firms. Indeed, thanks to this theory, we can identify how a structural position can be an advantage or a disadvantage for an actor, for example, in obtaining information, exercising control or creating links.

The *tertius gaudens* strategy

According to social network theory, the position of intermediary encourages the function of control (Burt, 1992). The benefits of control are shown in the role of the *tertius gaudens*, i.e. the actor who benefits from being in the position of intermediary. A *tertius gaudens* is an actor who uses the discord of other actors (Simmel and Wolff, 1950), and the two strategies of the *tertius* (Burt, 1992) are related to two contexts: where actors are competitors and where they have incompatible demands. For successful cooperation, it is important to avoid opportunistic behaviors. So, when competitors are not reassured by the other partner, they need an actor to play the role of intermediary when the cooperative relationship is constructed. This intermediary functions as the guarantor and controller of the relationships

between the actors; this intermediary thus controls how each partner actually fulfills the intermediary's own commitments.

The structural holes in social networks, however, can distort our exploratory approach to intermediation relationships in a cooperative context. Structural holes encourage the position of *tertius gaudens* (Simmel and Wolff, 1950; Burt, 1992). As a structural bridge, the latter has an interest in maintaining the structural holes in a network. *Tertius gaudens* has favored access to information and controls the games between the other actors due to the asymmetry of information. Thus, *tertius gaudens* holds a position of domination over the actors.

According to Burt (1992), there are two aspects to the *tertius gaudens* strategy (see Table 1).

The first aspect consists of developing information and control benefits from an existing structural hole. The second aspect consists of creating structural holes to place the *tertius* in a strong position. In both cases, *tertius* actors try to reinforce their domination over contacts by withdrawing or adding contacts to the situation. They can also embed the situation in a higher-order location in which they have a more advantageous position. If contacts are redundant, the *tertius* strategy is carried out in the same cluster, whereas if contacts are non-redundant, other clusters in the situation can be taken into account. For example, Thales Alenia Space and Astrium are two major European aerospace prime contractors. A customer can play a *tertius* role by withdrawing from or adding a contact to the competition or by establishing a second relationship with a contact. The *tertius* can also decide to open the network to other clusters (American primes) to create structural holes and increase his/her dominant position. In both cases, *tertius* actors want to impose their decisions and keep a position of domination in the situation (Simmel, 1950). Thus, cooperative relationships will be managed by a *tertius* who achieves the dominant position.

Many scholars thus insist on the importance of the institutional environment for the strategic choices of firms in cooperation (see, for example, DiMaggio & Powell, 1983). Recently, Mariani (2007) examined three competitive Italian opera houses and noted the key role that the institutional environment (the Tuscany regional policy maker) played in inducing the emergence of cooperative strategic behaviors through the imposition of cooperation. Research by Depeyre and Dumez (2010) on the US defense industry is revealing of larger realities; the customer proposes concentrating sup-

Table 1 Double aspects of *tertius gaudens* strategy.

Aspect 2: Creating structural holes which place the <i>tertius</i> in a strong position	Aspect 1: Developing information and control benefits from an existing structural hole	
	Redundant contacts in play	Non-redundant contacts in play
Withdrawal	Withdrawing from a contact in favor of a competitor	Withdrawing from a contact's cluster to focus network resources on other clusters
Expansion	Adding a contact's competitor to the network	Adding a new cluster to the network
Embedding	Establishing a second relationship with a contact, giving the player more control	Establishing a second relationship with either or both contacts, giving the player more control

Source: Burt (1992, p. 230).

pliers in an industry where the vertical integration model is the rule (Depeyre & Dumez, 2009). The customer can choose SMEs and instruct them to form an alliance. Consequently, a coepetitive system is created whereby the customer is a stakeholder who decides the nature, structure and aims of the coepetitive relationships (Vilanova, 2007). In these cases, customers play *tertius gaudens* roles by imposing cooperation on stakeholders. More generally, a *tertius gaudens* has a dominant position and imposes decisions on competitors. Of course, firms are not obliged to accept coepetition; however, they would not enter into an industrial programme if they refused to cooperate with their competitors.

Proposition 1. The first role of the *tertius* is to dominate competitors by imposing cooperation.

However, another *tertius* analysis is possible (Garriga, 2010; Obstfeld, 2005). In this case, we do not consider the dominant position of the *tertius* but rather his/her ability to connect different actors. The second strategy of the *tertius* is related to the *tertius iungens* role (the actor who joins, who allies).

The *tertius iungens* strategy

The *tertius iungens* has the capacity to link people in order to achieve a commonly-held and predetermined aim (Obstfeld, 2005). This action is not partisan but mediative (Simmel and Wolff, 1950). The strategy of this actor is more relevant in concentrated networks because the *tertius iungens* links changes among all the individual actors. Therefore, the work of Obstfeld completes that of Burt, because in sparse networks the *tertius* is not emotionally involved in the relationships with others. The *tertius* can make use of the situation as "the third who enjoys" (Simmel and Wolff, 1950). For example, "The *tertius iungens* orientation is a strategic, behavioral orientation toward connecting people in one's social network by either introducing disconnected individuals or facilitating new coordination between connected individuals" (Obstfeld, 2005, p. 102). This definition by Obstfeld (2005) is based on the Simmel (1950) approach: "The non-partisan either produces the concord of two colliding parties, whereby he withdraws after making the effort of creating direct contact between the unconnected or quarreling elements; or he functions as an arbiter who balances, as it were, their contradictory claims against one another and eliminates what is incompatible in them" (Simmel, 1950).

First, a *tertius iungens* may be a disinterested intermediary. This is the case, for example, when coepetition is the fruit of a public actor seeking cooperation between competitors. The *tertius* is concerned with the general interest and is not seeking to satisfy personal interests. In other words, he/she is taking relevant actions for the common interest. Second, the *tertius iungens* is there to bring together stakeholders who were not connected (Garriga, 2010). In this case, the *tertius iungens* proposes cooperation to competitors.

Proposition 2. The second role of the *tertius* is to connect competitors by proposing cooperation.

Methodology

In this section, we present the case, the sample and the data analysis.

Case

The aeronautical and aerospace engineering sector concerns three types of activity: the construction of aircraft engines, the construction of aircraft cells, and the construction of launchers and spacecraft. We used the NACE (European standard nomenclature for economic activities) classification to select the firms for this study. This classification focuses on the main activity of a firm, although the intervention of suppliers (systems and subsets) within industrial programmes is steadily increasing. Therefore, this classification is imperfect because it minimizes the weight of suppliers. For example, the GIFAS (French Aerospace Industries Association) classification includes the position of the actors: primes, subcontractors, and so on.

The Aerospace Industries Association has estimated that world sales for this sector amounted to US\$204 billion in 2008 compared with US\$200 billion in 2007. Civil aviation represents 40% of world sales, as opposed to 26% for military aviation, 16% for the space industry, and 6% for missiles. In 2008, the aeronautical and aerospace engineering sector employed 655,500 people and made a profit of US\$21 billion. Moreover, the sector has shown a strong trend towards concentration, mergers and acquisitions (M&A), and alliances; for example, Boeing and McDonnell (M&A in 1997), Vitrociset and EADS Space (alliance in 1997), EADS ST and Alcatel (alliance in 1998), and Dassault Aviation, EADS and Thales (alliance in 1999). Coepetitive relationships are increasingly more frequent, with focal firms playing a role in coordination and intermediation.

Aerospace industries have changed. The largest companies, which were initially manufacturers of aerospace products, have been transformed into integrators of parts for aircraft, satellites, etc. The high investment and long production cycles have led to changes in how an entire range of firms is structured (subcontractors, primes, etc.). The aeronautic industry began its transformation at the end of the 1980s. The traditional model of subcontracting was reconsidered and the structure of subcontracting was from that point on hierarchical. The prime now concentrates on key skills and delegates the assembly of complete subsets to subcontractors and co-contractors at a lower tier (Kechidi & Talbot, 2010). Large industrialists make good use of all competencies (internally or by using external sources), with the main aim of decreasing costs. For example, Airbus started the Power 8 programme of aim retrenchment and concentration on core competencies in 2007. The space industry is focused on winning the world market through strategic alliances, mergers and acquisitions. Two large competitive industrialists dominate the sector: EADS Astrium and Thalès Alenia Space. The one that is the primary system manufacturer or "prime" on a project consults for the supply of subsystems and engages in competing processes between its own services and those of the other industrialists; in fact, often the services of its competitor. The practice is similar in the lower ranks, and thus a domino effect occurs. The firms

in the space industry are organized by projects and sub-projects, with competitors included at different levels. The aerospace industry is organized like a network in which a linchpin firm coordinates the activities of its subcontractors according to the logic of bilateral dependence.

Thus, the organization of the aerospace industry includes three major categories of actors. The customer orders a product from an industrial project manager (Airbus, Astrium, etc.). This can be a private company (Air France, for example) or a public organization (call to tender: CNES, ESA, etc.). The industrial project manager can build the product alone or in collaboration with another firm (co-project manager). If it is a collaborative project, the customer chooses a referral industrial project manager which will be his/her only representative. This referral industrial project manager is called a "prime" and is responsible for the project. In order to complete the work, the prime often structures the project using a consortium of firms. Indeed, the importance and size of the order, the level of resources required (financial, human, etc.), innovative capacities, and so on all encourage the prime to build a community of firms participating in the project. Thus, the prime relies on a wide range of subcontractors to supply him/her with the systems and subsystems for the final product.

There are three types of the above-mentioned suppliers (Niosi & Zhegu, 2005): (1) the first-tier suppliers design, produce and deliver systems, subsets or complete modules to the customer. They coordinate the relationships with the suppliers in the lower ranks; (2) the second-tier suppliers manufacture systems of propulsion, avionics, structure and subsets; and (3) the third-tier suppliers manufacture electronic subsets, hydraulic systems, fuselage parts, etc. It should be noted that a supplier in Rank 2 can be in Rank 1 for certain activities and Rank 3 for others. The suppliers in the lower ranks do not have a direct relationship with the initial customer. This classification of suppliers is not perfect because suppliers can have one activity in the first tier and another in the second. First-tier suppliers and second-tier suppliers are rather large firms, whereas third-tier suppliers are usually SMEs. All actors can participate in or initiate a cooperative process.

To conclude, a co-project manager can be the rival of the prime. For example, the ESA and the CNES might order from Astrium (prime) and Thales Alenia Space (co-project manager) a specific family of satellites. A prime's supplier can also be a rival (for example, Thales Alenia Space is the supplier to Astrium of the Alphabus Programme). In addition, suppliers can work with rivals within a created consortium (e.g. GE Aviation and Pratt & Whitney work together to supply Airbus with engines for the Airbus A380). The aeronautic and aerospace sectors are good examples of multi-point cooperation (Bidault & Salgado, 2001) between competitors.

Sample

We conducted 58 interviews with members of 37 organizations in the aerospace industry (including prime contractors, subcontractors, research centres and economic agencies such as the European Space Agency). Eight groups of actors (French firms) were selected. We directed the

interviews towards the cooperative relationships between the following actors (see Table 2).

Each actor is in a direct relationship with those in the rank immediately below. For example, the customer has relationships only with the prime contractors, not with the suppliers; first-tier suppliers have relationships only with second-tier suppliers, and so on. Twenty-three percent of the interviews were conducted by phone and 77% were face to face; 61% of the organizations were large firms and 39% were SMEs. One third of the interviewees were CEOs, another third were Division Managers, and the remaining third were engineers, middle managers, etc.

In order to guarantee the privacy of the people interviewed, the *verbatim* quotes have been anonymised.

Data analysis

We used grounded theory (GT) to analyze our data. According to Charmaz (2005, p. 508), "A GT approach encourages researchers to remain close to their studied world and to develop an integrated set of theoretical concepts from their empirical materials that not only synthesize and interpret them but also show processual relationships". Moreover, we decided to work with abductive reasoning in accordance with the Straussian paradigm (Strauss & Corbin, 1998). We consider it extremely difficult not to take into account the concepts behind one's own research topic. We therefore presented the literature on intermediation in our review of the literature and will describe how those we interviewed see the roles of intermediation in this sector. Our goal was thus to describe the *tertius* roles and to obtain a panoramic view of intermediation in the aerospace industry. The results of propositions 1 and 2 are synthesized in Figure 1 and developed from the *verbatim* and content analyses.

The data analysis was undertaken in three stages. (1) The principal concepts were identified to assign topics for open coding (Locke, 2001) in order to create provisional categories for the first order. Open coding is the first level of abstraction. We codified each idea with a concept and then modified the concepts as needed to ensure that the revisited data fitted well with the category. (2) We used axial coding to connect the various identified categories (Glaser & Strauss, 1967) in order to create consolidated categories of a higher nature (theoretical dimensions). The goal was to identify similarities and relationships in different forms of discourse in terms of the categories identified in the previous step. We then selected the central idea that emerged from the axial coding and assumed that this was the emerging structure of our theory (selective coding). (3) The final aggregation was made possible by gathering the theoretical categories for the second order. These were compared in order to create theoretical aggregates, constituting the last stage of the qualitative analysis and delimiting the theoretical framework (Locke, 2001). We looked for dimensions underlying these categories in an attempt to understand how the different categories fit together in a coherent picture.

Findings

We asked general questions about the competitive environment in the aerospace industry and focused particularly on

Table 2 Sample description.

Group	Description	Organization	Description	Inter-views
1 Customers (C)	These organizations are the prime's customers. They are mainly public organizations	CNES	French National Space Research Centre	1
		DGA	French Ministry of Defense	1
		DGAC	French public agency for civil aviation	2
2 Public administration (PuA)	These are not customers and their activities relate to developing an economic and social area	ESA	European Space Agency	3
		The Toulouse Chamber of Commerce	French Chamber of Commerce for the City of Toulouse	1
3 Primes (P)	These are mainly large firms which lead and manage the global project	Conseil Général Haute-Garonne	French public agency for the district of Haute-Garonne	1
		Airbus	Aircraft manufacturer	5
4 Research centres (RC)	These play the role of experts regarding an innovative development relating to a project	Astrium	European space company	5
		Dassault Aviation	Aircraft manufacturer	1
		EADS (Corporate)	European Aeronautic Defense and Space Company	1
		Thales Alenia Space	European space company	9
		CEA	French Atomic Energy and Alternative Energies Commission	1
		CNRS Toulouse	National Centre for Scientific Research of Toulouse	1
		MEDES	French cooperative public laboratory for space research	1
5 First-tier suppliers (FS)	These suppliers design, produce and deliver systems, subsets or complete modules to the customer	ONERA	French Aerospace Laboratory	1
		TESA	French cooperative public laboratory for space research	1
		Aircelle	Nacelle, thrust reverser and aerostructure manufacturer	1
		Labinal	Electrical wiring systems manufacturer	1
		Liebherr-Aerospace	Air systems for aircraft manufacturer	1
		Sogerma	Aerostructure, cockpit seat and cabin interior manufacturer	1
		Thales Avionics	Onboard and ground systems manufacturer	1
6 Second-tier suppliers (SS)	These suppliers manufacture systems for propulsion, avionics, structure and subsets	Altran	Innovation consulting	1
		Desirade	Computing services company	1
		Integral Systems	The secure management, delivery and distribution of data	1
		Isocel	Strategic management consulting	1
		Mercator Ocean	Provider of ocean information	1
		Spot Image	Provider of geoinformation products and geospatial services	1
		Steria	Computing services and integrated systems	1
		Telespazio	Provider of satellite services	1
Toptech	Strategic management consulting	1		

(continued on next page)

Table 2 (continued)

Group	Description	Organization	Description	Inter-views
7	Third-tier suppliers (TS) These suppliers manufacture electronic subsets, hydraulic systems, parts of fuselage, etc.	Aerofonctions SAS	Mechanical assembly and manufacturing composite	1
		EMAC	Firm developing customized rubber compounds	1
		Siemens VDO	Suppliers of electronics, electricals and mechatronics	1
		Sierbla	Complex industrial projects for design and engineering	1
8	Professional associations (PrA) These organizations are the meeting place of all the actors (clubs, standardization, etc.)	BNAE	Aerospace and Defense Standardization	1
		Cofrend	Aerospace and Defense Standardization	3
		Mecanic Vallée	French competitiveness cluster	1
Total				58

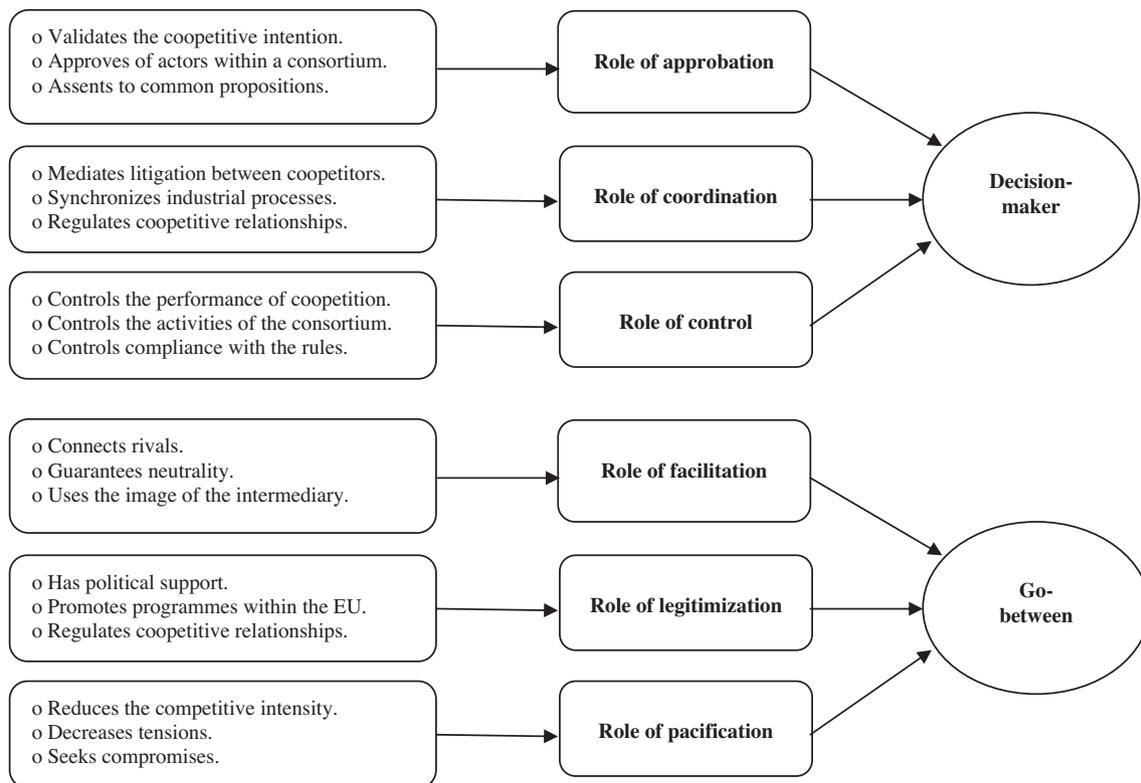


Figure 1 Characteristics of both types of intermediary.

the following questions: “Do you play an intermediation role in the cooperative process?” and “Which actors could have played an intermediation role in the cooperative process?” All the interviewees were focused on their capacity to join organizations together. As a result of the data analysis, two types of third actor were identified (Figure 1): “decision-makers” and “go-betweens”. Both have intermediation roles but with some specificities. We connected these roles with the *tertius* profiles identified in the literature.

Decision-makers

“Decision-makers” have roles of approbation, coordination and control in the cooperative programmes. Decision-makers are customers (CNES, DGA, DGAC, ESA) or primes (Airbus, Astrium, Thales Alenia Space, and so on). They exert their influence as leaders over the course of the entire programme, from the call to tender open to consortiums (approbation of the choice of actors, etc.), to mediation during the life of the programme (coordination of choices,

Table 3 Extracts from the verbatim accounts: the decision-maker.

Role of approbation	<p>“[...] we are entitled to our say! And we accept the choice suggested or not” (C)</p> <p>“[...] i.e. that we force them to cooperate once actors have been selected and, according to their offer, we undertake the selection of an industrial consortium thanks to our own tools” (C)</p> <p>“[The “decision-maker” intermediary] validates the process by controlling some data and monitoring them close to the manufacturer” (C)</p> <p>“[...] we set the cooperation at the beginning. We tell that to our customer, and we say that for this project, this firm and this other firm will make a global offer” (FS)</p>
Role of coordination	<p>“[...] we arbitrate problems between firms but we are, today, introducing an ombudsman who has the role of mediation in order to intervene in litigations [...] firms will be able to have recourse to the ombudsman during the execution of the contract” (C)</p> <p>“[...] we play a role of coordination between the different subcontractors” (FS)</p> <p>“On the other hand, there is a regulator [...] who regulates all the competition” (FS)</p> <p>“[...] we try to position the firm as a structure of coordination” (RC)</p> <p>“When we play the role of designer, we play the role of consultant too” (RC)</p>
Role of control	<p>“[...] we must make sure that rules are respected, that everybody has the chance to apply to the call to tender and that the process has proceeded correctly” (C)</p> <p>“[...] there is a regulatory authority, the CNES, which is the master of the entire programme” (FS)</p> <p>“[The “decision-maker” intermediary] controls the competitors who want to join with each other” (PrA)</p>

risks, etc.), to control of the results (control to obtain the good performance of the cooperative process, etc.). The main *verbatim* quotes of the “decision-makers” are presented in Table 3. “Decision-makers” are close to the *tertius gaudens* we identified in the theoretical background section (proposition 1).

Role of approbation

First, “decision-makers” validate the cooperative proposals submitted by the firms (see the *verbatim* account in Table 3). All actors then participate in building the cooperative process in which each stakeholder can validate its involvement in the programme (planning, sharing of gains and risks, etc.).

“Decision-makers” are referral actors for the role of approbation, mostly involved upstream during the creation of an industrial consortium. They validate the options and orientations.

“Decision-makers” are deeply embedded in the cooperative process. Their role is to monitor the appropriateness of skills in relation to the call to tender, the fair share of business, industrial organization, etc. Given their strong involvement, they are accepted by the manufacturers, who inform them of the cooperative intention of their response to the call to tender.

“Decision-makers” are thus allowed to speak for all the actors in the entire value chain of the cooperative programme. Firms (primes) inform the “decision-makers” of all the stakeholders in the cooperative programme, and the “decision-makers” either approve or do not approve the rapprochement of the actors.

Role of coordination

Second, “decision-makers” coordinate the firms’ actions over the successive programme phases of the cooperative life cycle (see the *verbatim* account in Table 3). They inter-

vene from above to solve problems and deal with litigation that may arise during the furtherance of the programme. They act as arbiters and mediators.

Moreover, “decision-makers” coordinate and organize the industrial system in order to optimize the cooperative relationships. In this sense, they function as relays between lower-tier and higher-tier actors. The process of cooperative coordination may seem long to the various actors but this coordination is the guarantor of peaceful relationships and the appropriateness of all expectations.

This coordinating role makes “decision-makers” the designers of cooperative relationships. Thus, “decision-makers” become the regulators of cooperative behavior.

Role of control

Third, “decision-makers” control cooperative activities (see the *verbatim* account in Table 3). Cooperation may be set as a compulsory condition in order to ensure the continuous control of consortium activities. “Decision-makers” control the openness of the competitive and cooperative rules; thus, the call to tender, the openness of the relationships between actors, and so on are just some of the elements monitored by the “decision-maker”. Thanks to the monitoring activities of “decision-makers”, the other actors are kept on track to carry out what they stated they would do during the call to tender. Cooperative actions are monitored to ensure that the preset rules are respected, so “decision-makers” are in this sense prescriptive actors suggesting corrective actions based on the findings of the control activity.

Go-betweens

“Go-betweens” fulfill functions of facilitation, legitimization and pacification in cooperative relationships. They

Table 4 Extracts from the verbatim accounts: the go-between.

Role of facilitation	<p>"[...] we are "facilitators" to make sure that the cooperative programme does not to pose a problem for us. It is in our interests to stay neutral" (P)</p> <p>"[...] According to the intermediary, [...] I say that it is necessary to have a neutral person who likes firm A as much as firm B or C, who has no preference for firms. He is here to uncover a new piece of the puzzle and public agencies often play this role" (RC)</p> <p>"[...] a firm acts in its business but cannot access the competitor directly. So, this firm uses the public laboratory like an intermediary in order to meet the rival. I think that it is a scenario which is very common, especially with public research laboratories" (RC)</p> <p>"We play the role of intermediation, of "go-between" between firms of business incubators" (PuA).</p> <p>"In order to keep good relations, we make connections between competitors" (PrA)</p>
Role of legitimization	<p>"[...] we can serve intermediaries, but it is in particular a political aim" (P)</p> <p>"The French Government plays the role of intermediary, negotiator, or political facilitator" (P)</p> <p>"[...] we help them with our know-how, our relationships, our address book and our networks" (TS)</p> <p>"[...] we understood that if we want to get projects and we do not appeal to an intermediary, we will not get the programme" (RC)</p> <p>"We said to ourselves: Sir, I think that you are mature enough. We have led six or seven meetings for two years [...] Now you know yourselves enough that you can agree between you to win the project" (RC)</p>
Role of pacification	<p>"So, we try to connect firms in order to meet other firms. We play the role of peacemaker" (PuA)</p> <p>"[...] we deposit the weapons outside before the meeting and we talk on topics which are not strategic topics or confidential topics. Thus, we realize that competitors can talk together, that we speak the same language, that we have the same interests to act, and that it is interesting to work together" (PrA)</p>

initiate coepetitive games and facilitate meetings between competitors, either at the competitors' or the customer's behest. Contrary to the actions of the "decision-maker" role, "go-betweens" act only in the initial phase of a project, before a response to the call to tender is expressed. In France, "go-betweens" are often public agencies or research centres. The main *verbatim* accounts of the "go-betweens" are presented in Table 4. "Go-betweens" are close to the *tertius iungens* profile identified in the literature (proposition 2).

Role of facilitation

"Go-betweens" play a facilitating role in the relationships between firms (see the *verbatim* account in Table 4). They encourage the building of links and connections between rivals so that they can study potential cooperative opportunities. This ability to link firms is guaranteed by the neutrality of "go-betweens": they do not help one stakeholder to the detriment of another. They treat all coepetitors equally.

Actors will have recourse to "go-betweens" when they need to join with other actors of good reputation in their sector in order to access a market or achieve legitimacy. "Go-betweens" can be used to approach a competitor when the competitive intensity and the aggressive strategies are strong.

Role of legitimization

Firms can also use "go-betweens" in order to gain political support and promote programmes within the European Authority. Thus, "go-betweens" have lobbying roles. This legitimizing role can also be used to win business which would not have been gained without the intervention of a third actor (see the *verbatim* account in Table 4).

"Go-betweens" have short-term roles: they do not follow projects to the end but simply function to help make connections between rivals. The competitors are then free either to cooperate or not. "Go-betweens" do not have roles of approbation in the coordination or control of a coepetitive programme.

Role of pacification

By their actions, "go-betweens" reduce stress and competitive intensity and encourage connections between competitors (see the *verbatim* account in Table 4). They are in this sense peacemakers between actors from different worlds. For example, they pacify the relationships between actors from the public and the private sectors. This is much more a role of reconciliation, whereas the role of facilitation is necessary to create the relationships.

"Go-betweens" are often public administrative agencies or research centres (such as a public research laboratory). The role of intermediation concerns all actors participating in an industrial network and the stakeholders of coepetitive relationships.

Discussion

The European aeronautical and aerospace engineering sector is characterized by a high level of interaction between the various actors. The actions of some firms influence the actions of many others (Thorelli, 1986; Vilanova, 2007) because they are situated at different levels of the supply chain (Chin et al., 2008; Dagnino & Padula, 2002; Luo, 2007; Luo et al., 2006; Osarenkhoe, 2010; Pathak et al., 2007; Peng & Bourne, 2009). Firm involvement and the relationships between the firms are

very important within the network. Many of these relationships have been encouraged or forced by one of the two types of *tertius*. Our results connect the two *tertius* profiles (*gaudens* and *iungens*) to the two types of third actors who intermediate cooperation: “decision-makers” and “go-betweens”.

The study shows that third actors can be decision-makers, managing and initiating strategies within a network (Spulber, 2003). “Decision-makers” are most often customers or primes who are highly involved and well-integrated in cooperative relationships. They hold a great deal of power over cooperative methods and can use their influence to force rival suppliers to cooperate. This supports proposition 1, according to which the *tertius gaudens* imposes cooperation. “Decision-makers” play a role of approbation regarding the connections between competitors, by validating choices, coordinating the organization of the cooperative process, and controlling the path of cooperative relationships. “Decision-makers” identify business opportunities, select actors, validate the consortium (Fréry, 2006; Miles & Snow, 1992), acting as the hub firm (Jarillo, 1988), and seek opportunities in their own interests. “Decision-makers” link firms to satisfy their own aims, such as having a better price or an improved technological offer. “Decision-makers” produce an organizational mode based on prices and on their capacity to coordinate (Johanson & Mattson, 1987), lead, manage and guarantee the governance of cooperative relationships (Lorenzoni & Baden-Fuller, 1995).

“Decision-makers” are coordinators (Miles & Snow, 1992). The risks of opportunistic behavior are reduced due to the control and mediation of conflicts. “Decision-makers” control the path of the organizational cooperative process, the respect for rules, the good behavior of the actors, etc. (Fréry, 2006). The “decision-maker” gains the role of control (Burt, 1992) and benefits from this intermediation position (Simmel and Wolff, 1950). “Decision-makers” are real *tertius gaudens* because they use their dominant position to reinforce their business position.

The study shows that third actors can also be *tertius iungens*. These are the “go-betweens”, who play roles of facilitation, legitimization and pacification. They act as mediators between all the firms involved (Simmel, 1950). “Go-betweens” are generally public agencies or research centres, but not customers. They use their influence and their knowledge of networks and markets to connect the actors (Fréry, 2006). They manage cooperation as *tertius iungens* (proposition 2). “Go-betweens” do not seek to maintain structural holes and the social structure (Burt, 1992), but encourage union between actors (Obstfeld, 2005). They encourage cooperative relationships, and they work to make them durable and to support the network (Miles & Snow, 1992). “Go-betweens” bring actors together for one specific aim: cooperation.

An important aim in the beginning of a cooperative programme is the legitimization of the actors in the market to ensure that the cooperation will become a legitimate paradigm. Intermediaries reduce the competitive intensity in order to connect the actors, allowing a kind of “avoidance strategy” and pacifying relationships. The role of intermediation is vital at the start of cooperative relationships be-

cause opportunistic behaviors need to be avoided (Obstfeld, 2005).

With this article, we have contributed to the theory by studying the *tertius gaudens* profile and the *tertius iungens* profile simultaneously. Indeed, previous research has focused exclusively on *tertius gaudens* behavior (Simmel and Wolff, 1950; Burt, 1992) or on that of the *tertius iungens* (Garriga, 2010; Obstfeld, 2005). By studying these two profiles jointly, we show that there are different *tertius* behaviors which correspond to different actors, situations, and outputs.

We identified two main managerial implications of our work. First, firms take cooperation into account at all steps of the value chain. This means that all the relationships are often embedded in the cooperative context. Thus, if managers are aware of this reality, they will be better able to manage these different cooperations. For example, the prime may impose cooperation on its complementors, even though they are competitors. The prime would then play the roles of the *tertius gaudens* identified in our results (the decision-maker): approbation, coordination and control. Second, public actors (public research centres and public administrations) can play the role of *tertius iungens* (the “go-betweens”). Indeed, the *tertius iungens* can join two competitors in cooperation by being the guarantor of non-opportunistic behaviors. For example, the European Space Agency could reinforce its role to assist the development of SMEs by proposing specific programmes to them. Consequently, small businesses would be in a better position to answer a call for tenders.

This research has some limitations. The actors are not clearly identified because they sometimes occupy more than one level of the supply chain. Indeed, as we have seen, suppliers can be in the first tier for some activities and the second or third tier for others. Clearly defining the intermediaries is also complicated, as they may be customers, public agencies, suppliers, etc. Further research is needed to more fully develop our approach in order to better understand intermediation: who is considered to be an intermediary and who wishes to be considered as an intermediary? On the other hand, this work completes a previous study related to cooperative relationships in the US defense industry (Depeyre & Dumez, 2010). However, several works (Zuliani, 2007) show that the French cluster in Aerospace Valley has economic specificities (the involvement of a public agency in a private system, etc.). Thus, the contingent character of our analysis (made in a European industry) should be taken into consideration and another area or country will need to be examined. We will soon begin new research related to the Texan cluster in the aeronautical and aerospace sector.

Last, this dynamic study (semi-structured interviews) shows the specificities of intermediation in the aeronautical and aerospace engineering sector. However, this research has not provided a view of the characteristics of intermediation. Studies using quantitative methods could answer the following questions: What are the explanatory factors in intermediation in the cooperative context? How can competition be increased in a cooperative setting? And is it possible to refine the types of *tertius gaudens* and *tertius iungens*?

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