Coordination in temporary organizations: formal and informal mechanisms at the 2016 Olympics

Abstract:

Purpose – This paper explores intra-firm coordination in temporary organizations (TOs). Specifically, it identifies and explains how operational coordination evolves over time in a particular TO: the 2016 Olympic Games Organizing Committee.

Design/methodology/approach – This is an immersive case study based on qualitative analysis and longitudinal fieldwork, which allowed the observation of operational coordination in real time. The main sources of data are participant observation, semi-structured interviews, and internal documents of the TO.

Findings – Our findings suggest that operational coordination in TOs dealing with multiple and decentralized operations takes place through the combination of both formal and informal coordination mechanisms. Further analysis indicates a contingency logic in using these mechanisms, shaped by the presence of specific coordination challenges in different phases of work. Three main aspects influencing coordination are explored. Firstly, we suggest that TOs are inherently 'hybrid'. That is, they comprise enduring as well as temporary and centralized as well as decentralized elements. These elements change over time. Secondly, we explore *'venueization'* – a formal transition phase between planning and operation in which centralized structural elements and processes are translated to operational units. Thirdly, since TOs present emergence and dynamism, and related challenges across various phases of work, we argue that coordination is contingent on the phase of the project.

Research limitations/implications – Although we recognize that our findings are limited to the empirical context in analysis, we believe that this paper more broadly provides a generalizable basis for future research to explore the dynamic nature of operational coordination in TOs.

Practical implications – Our findings can help practitioners understand and identify the challenges embedded in temporary contexts and develop coordination strategies accordingly.

Originality/value – This study explains how operational coordination takes place in TOs enabled by formal and informal mechanisms, which are contingently combined over time through particular coordination strategies.

Keywords: Temporary organizations; Operational coordination; Contingency Theory; Project management; Hybridity; 2016 Olympic Games.

Paper type: Case study

1. Introduction

The primary concern of the Operations Management (OM) discipline is the design of operations and supply networks that enable organizations to deliver products and services (Fisher, 1997; Slack *et al*., 2010). Since the early development of manufacturing strategy (Skinner, 1969), a critical task of the OM field has been to design processes according to the market requirements they are supposed to satisfy. For example, while Hayes and Wheelwright (1984) related the design of the process to the stage of the product life cycle, for Hill (1985), the 'process choice' was related to volume. In the popular treatment of process design in Slack *et al.* (2010), volume and variety determine the choice of technology, the design of jobs and the layout or flow of process stages, as well as aspects of planning and control. In many of these frameworks, 'project' is one of the basic process types, suited, like the job shop, to high variety and low volume activities.

These approaches are based on an application of contingency theory (e.g. Galbraith, 1973), albeit that this foundation is often implicit rather than explicit (Sousa and Voss, 2008). Furthermore, as with the development of contingency theory in the general organisation studies literature, the emphasis in OM has been on the design of processes and supply chains rather than on examining how operations activities are carried out within these designs, i.e. how things actually get done at the operational level (Okhuysen and Bechky, 2009). In some specific contexts, including those of project management and software engineering, informal coordination within formal structures has been considered (e.g., Faraj and Sproull, 2000; Hanisch and Wald, 2014, Sydow *et al*., 2004). However, these tend to be exceptions. Overall, studies have tended to downplay the organisational means and human interactions that make coordination actually happen. More recently, however, OM researchers are increasingly turning their attention to informal operational coordination, across a wider range of process types. For example, Dobrzykowski and Tarafdar (2015) show that social interaction ties are an important complement to formal processes for information exchange in a healthcare setting; Sting and Loch (2016) demonstrate the importance of bottom-up 'search' processes in coordinating the implementation of multiple, inter-related strategies in large manufacturing companies; and Pagell *et al*. (2015) show that relational coordination allows the achievement of potentially contradictory demands of safety and operational effectiveness.

In this paper, we combine a contingency perspective with this enhanced sensitivity to informal coordination, to examine temporary organizations (TOs) (Lundin and Söderholm, 1995; Söderlund, 2004; Sydow *et al*., 2004), which have particular relevance to the project

context. TOs are time-limited organizational forms designed around a shared purpose, ranging from projects, conferences, sporting events, and legislative sessions through task forces, theatre, and election campaign organizations (e.g., Meyerson *et al*., 1995; Miles, 1977). These organizations present especially interesting challenges for the dominant 'process-design-oriented' model of OM because they usually deal with novelty and uncertainty. While some approaches conceive of TOs as dealing primarily with low-volume and high-variety processes, others recognize that TOs exhibit different degrees of volume and variety (e.g. Maylor, 2010; Meredith and Mantel, 2008). For example, while some projects are relatively small and incremental in nature, taking place within the structures of an enduring organization, others are carried out by an organization that is established especially for the completion of a particular task, and is then disbanded. TOs are therefore temporary to differing degrees and in different ways. This arguably influences how activities are coordinated.

Besides novelty and uncertainty, there are particular challenges to coordination in temporary contexts such as time pressure, high levels of interdependence, a need for rapid action, and on-the-spot decision making (Bechky, 2006; Majchrzak *et al.*, 2007; Sydow *et al.*, 2004). For example, disaster response involves many interdependent tasks, a great number and variety of actors, and incomplete information in settings demanding urgent action (Kovács and Spens, 2007; Van Wassenhove, 2006). As a result, decentralized decision-making and non-standardized solutions emerge. Mega-events (such as the Olympics or the World Cup) are unique events for the host cities, huge and complex in nature, involve massive numbers of people, and occur in different localities, with very varied conditions. There are usually formal processes by which knowledge is transferred from one edition of the event to the next, but these can only capture very high-level and codifiable information. The organizations running them have a limited lifetime and usually lack the organizational memory to maintain more detailed knowledge (Currie and Shalaby, 2012; Minis and Tsamboulas, 2008). Construction projects present their own coordination problems due to their size, dispersed operations, and multiple and diverse actors (e.g., designers, subcontractors, and construction managers) (Jha and Iyer, 2006). Operational coordination thus assumes a central role in these TOs. This is because they are driven by tasks and processes usually developed and executed by multiple teams and entities that are decentralized in some way, which need to work interdependently to accomplish their time-constrained activities.

Although some scholars have addressed coordination problems in specific temporary contexts such as disaster relief operations, projects, and film sets (e.g. Bechky, 2006; Hanisch and Wald, 2014; Majchrzak *et al*., 2007), these studies assume that temporariness is a constant

and dominant feature of TOs, and explore coordination only during a specific period of time (usually in the operation phase). Given that TOs usually have a number of different phases (e.g., mitigation, preparedness, response, and rehabilitation in disaster responses (Kovács and Spens, 2007; Van Wassenhove, 2006) and conception, planning, development, and evaluation in projects (Maylor, 2010; Meredith and Mantel, 2008)), which have different kinds of activities and processes, it is likely that they may require different coordination strategies for the different phases. This emphasizes the need to examine operational coordination over time. Further, TOs exist in a variety of unique and distinctive settings and present different and fluctuating degrees of temporariness. As such, further understanding of how coordination takes place in TOs is necessary. Therefore, we address the following research question: *How does operational coordination take place through the various phases of work in temporary organizations?* For this, we have investigated a particular temporary organization: the 2016 Olympic Games Organizing Committee. Specifically, we have examined operational coordination through an immersive, real-time, longitudinal, and qualitative field study of this TO, immediately before and during the 2016 Olympic Games in Rio de Janeiro.

The following two sections cover relevant literature on firm-level coordination and on TOs. Next, we describe the study's methods and present its findings. Finally, we discuss the theoretical contributions, practical implications, and further research avenues.

2. Firm-level operational coordination

Coordination is defined as "integrating or linking together different parts of an organization to accomplish a collective set of tasks" (Van de Ven *et al.*, 1976, p. 322). Research on coordination in OM, following the evolution of the field, has addressed a wide range of topics. These include 'hard' (e.g., industrial management methods, inventories, and process improvements) and 'soft' issues such as supply chain management and strategy (Neely, 1993; Pilkington and Meredith, 2009), at different levels of analysis (strategic, tactical, and operational), within and between organizations.

This study focuses on intra-firm coordination at the operational level, that is, on coordination mechanisms that enable people to get operations done within the firm. According to Mintzberg (1989, p. 101), coordination mechanisms are "the most basic elements of structure" in organizations. They enable the completion of tasks and include formal and informal elements. Formal coordination mechanisms are implemented by managers and include plans, hierarchy, procedures, manuals, and routines, and are usually planned and

institutionalized throughout an organization. Informal coordination mechanisms are those that emerge from people on the ground, which are usually non-planned and non-institutionalized. They include creative solutions, mutual adjustments, social roles, and informal means of interaction (Lawrence and Lorsch, 1967; Thompson, 1967; Van de Ven *et al*., 1976). These mechanisms are used to enable coordination either through the design of tasks to reduce task interdependence, or through intensive communication among interdependent actors (Galbraith, 1973). Srikanth and Puranam (2010), however, suggest a third alternative: tacit coordination, based on the existence of 'common ground' among interdependent actors. This form of coordination is particularly important in settings where intensive communication is difficult, for example, because of distance, but standardized rules and procedures are insufficient due to task uncertainty and time pressure.

Coordination has been traditionally seen as *design*, which focuses on more planned and deterministic approaches. However, recent research has focussed increasingly on coordination as *practice*, examining how coordination takes place 'on the ground', enabled by coordination mechanisms (Okhuysen and Bechky, 2009). Therefore, these two aspects of the literature are reviewed.

2.1 Coordination as design

Traditional approaches to coordination focused on the design of formal mechanisms. The design of work and management systems through specialization, standardization, and rationalization was the basis of the classical management approach (Taylor, 1916; Fayol, 1949). "This approach became marked by the notion that they were searching for 'the one best way'" (Van de Ven *et al*., 2013). It has been especially instrumental in developing the 'best practice' paradigm in OM, which assumes that the adoption of best (world-class) practices leads to superior performance (Voss, 1995). The widespread adoption of management practices relating to total quality management and lean production illustrates this paradigm (Sousa and Voss, 2008).

In the 1960s/1970s, organization design scholars, reacting to the notion of 'one best way' (Van de Ven *et al*., 2013), developed the idea of contingency design. Coordination was conceptualized as being influenced by characteristics such as uncertainty, interdependence, and size. Greater uncertainty and task interdependence, it was held, leads to more coordination through interpersonal coordination mechanisms such as informal communication or mutual adjustment, rather than through formal mechanisms such as standardization, hierarchies, and routines (Galbraith 1973; Lawrence and Lorsch, 1967; Thompson, 1967). As unit size

increases, there is greater use of impersonal coordination and hierarchy (Van de Ven *et al*., 1976). Additionally, Burns and Stalker (1966) suggest that coordination is dependent upon the task nature (stable vs. changing), which in turn determines the organization design (bureaucratic vs. organic). These classic studies focused on the need to balance differentiation among organizational units, with integration achieved through coordination mechanisms.

These ideas have broadly influenced research in the OM field. Sousa and Voss (2008) consider the seminal works of Lawrence and Lorsch (1967) and Thompson (1967) as the precursors of major OM approaches. In particular, operations strategy (Skinner, 1969; Hayes and Wheelwright, 1984) is to a large extent concerned with achieving a strategic fit between operations processes and infrastructure, and the demands of the business environment. The dominant OM process design approach typically is about a one-off evaluation of the fit between the process type and the market conditions. Studies in OM, although clearly adopting Contingency Theory (CT) assumptions, do not explicitly state it (Sousa and Voss, 2008).

Revisiting CT in a contemporary context, Van de Ven *et al*. (2013) strongly encourage researchers to study the applicability of CT in studying rapidly changing operational systems. In particular, they focus on understanding variations in such systems in terms of: (1) design choice (centrally chosen, negotiated among stakeholders, or self-organizing); (2) control (planned or emergent); (3) formality (informal ad hoc or formal rational arrangements); (4) duration (short or long term); and (5) unit of analysis (internal or external, micro or macro) by (6) active or passive decision-makers. This study addresses this call by examining TOs, which present varying dynamics and coordination challenges throughout the various phases of work.

2.2 Coordination as 'practice'

In the 1990s, scholars increasingly conceptualized coordination as managing dependencies among activities, suggesting that different kinds of dependencies require specific coordination processes (e.g. Crowston, 1997; Malone *et al*., 1999). Recent approaches to coordination are "less concerned with optimizing structures for a given environment, and instead consider coordination as it happens, assuming that people in organizations must coordinate the work regardless of the organization design" (Okhuysen and Bechky, 2009, p. 469). For example, 'relational bureaucracy' (Gittell, 2002; Gittell and Douglass, 2012) recognizes that, although coordination may be facilitated by certain design elements, it is more fundamentally a process of interaction among participants (Pagell *et al*., 2015). Another example is the emergent coordination approach. It suggests that collective outcomes are achieved through ongoing interactions and activities to manage uncertain inputs in the face of unpredictable demands

(e.g., Bechky and Chung, 2017; Majchrzak *et al*., 2007). This depends very often on professional workers exercising discretion to integrate complex tasks (Bechky and Chung, 2017). Looking at a medical trauma centre, where fast-response and error-free tasks are vital, Faraj and Xiao (2006) found that coordination practices such as reliance on protocols, plug-and-play teaming, and knowledge sharing are essential for the management and application of distributed expertise.

These discussions of coordination as 'practice' focus on human agency and expertise, interactions, and emergent processes. There is a growing interest among OM researchers in this approach as scholars have begun to acknowledge the importance of 'soft' and emergent aspects of coordination, such as social roles and relationships (Dobrzykowski and Tarafdar, 2015; Sting and Loch, 2016; Pagell *et al.*, 2015). This complements the dominant, design-based view, which seeks to fit process choice to task characteristics and environmental conditions, and typically focuses on coordination in relatively enduring and stable settings at a given period of time. "Traditional coordination theory emphasizes the *how* (i.e., the mode) of coordination as opposed to the *what* (content) and *when* (circumstances) of coordination" (Faraj and Xiao, 2006, p. 1156).

In this paper, we seek to extend this approach by studying *how* coordination unfolds in the context of temporary, complex, and rapidly changing operations (*what*) across various phases of work (*when*). This longitudinal approach is useful in examining both perspectives on coordination (as design and as practice). It emphasises *coordinating* as a time-dependent process, rather than coordination as a state and, hence something that should be examined over time. Important aspects of design such as specialization, standardization, and rationalization take time to conceive and implement. In the same vein, 'practice' by its very nature extends over time and is only revealed as participants seek to coordinate activities in a temporal sequence in relation to unfolding external demands and constraints. The next section provides relevant literature on TOs, focusing on their coordination challenges.

3. Coordination challenges in temporary organizations

TOs present particular coordination challenges. Firstly, being seen as ephemeral and unstable, they tend to lack formal structures that facilitate coordination and control (Meyerson *et al*., 1995). Secondly, because the workforce is often employed temporarily, staff may not become familiar with the context specificities and with each other; they need to work interdependently based on 'swift trust' (Meyerson *et al*., 1995). Thirdly, these organizations often face

conditions of high uncertainty, complexity, time constraint, and fast decision-making, where mistakes can sometimes be catastrophic (Bechky, 2006). Finally, in project-based organizations there might be a tension between the autonomy requirements of participants in particular projects and their functional embeddedness within the more enduring organizational settings. This may demand embedding of informal activities within the organization's formal coordination routines (Sydow *et al.*, 2004).

Operational coordination in TOs tends to be understood as being based primarily on informal and interpersonal mechanisms, in contrast with the formal mechanisms that are predominant in permanent organizations (e.g. Hanisch and Wald, 2014; Bechky, 2006). More specifically, although Project Management standards and techniques have been introduced for coordination in some TOs, these substitutes for formal structures and processes are not always effective. Therefore, coordination tends to be characterized by high degrees of communication and mutual adjustment (Hanisch and Wald, 2014). In film sets, Bechky (2006, p. 17) develops the notion of role-based coordination, in which "coordination takes place in a negotiated order created through role enactments". She suggests that TOs tend to rely on interpersonal processes rather than on formal structures, due to high levels of task and environmental uncertainty. Similarly, Majchrzak *et al*. (2007) explore coordination in a disaster relief context. They point out that when disasters strike, formal structures and planned responses are "too slow, disconnected, and inadequate for the task", and emergent, action-based group responses are necessary to achieve coordination (Majchrzak *et al*., 2007, p. 147).

These views of coordination through emergent processes are largely regarded as contradictory and incompatible with coordination through stable structural arrangements (Bechky, 2006; Pauget and Wald, 2013). Furthermore, although some scholars address coordination problems in specific temporary contexts such as disaster relief operations, projects, and film sets (e.g. Bechky, 2006; Bechky and Chung, 2017; Hanisch and Wald, 2014; Majchrzak *et al*., 2007), these constitute a rather limited range of settings, and tend to concentrate mostly on the temporary aspect. Further research on coordination challenges in TOs, considering varying degrees of temporary and enduring elements, is necessary to draw more general conclusions on how coordination takes place. We address this by examining the 2016 Olympic Games Organizing Committee. The next section covers the study's methods.

4. Methods

We have conducted an immersive case study (Barratt *et al.*, 2011) using interviews, participant observation, and longitudinal fieldwork over a substantive portion of the time during which the temporary organization operated. This allowed the investigation of operational coordination in real time as it evolved in its natural setting, taking into account important contextual aspects (Meredith, 1998). In TOs, particularly, longitudinal research designs are powerful ways to investigate complex organizational phenomena over time (Bakker, 2010; Bechky, 2006).

4.1 Case selection

We have chosen a theoretically exemplar case (Eisenhardt, 1989) of TO: the 2016 Olympic Games Organizing Committee (OGOC). The Committee was established especially to organize the 2016 Olympic and Paralympic Games and was then disbanded. This is an interesting context because it combines great regularity across Games (allowing a certain amount of predictability and some enduring elements) with its uniqueness to each host city (bringing high levels of novelty, uncertainty, and emergent temporary elements). For instance, at the local level, the Organizing Committees are always temporary. However, they are not simply temporary structures; they also present varying degrees of both temporary (e.g. provisional structures and short-term contracts) and enduring elements (e.g. standardized processes defined by the International Olympic Committee – IOC).

We selected one area of operations of the OGOC: the transport operation, which involved the transport of more than 50,000 Games clients such as athletes, dignitaries, National Olympic Committees and IOC members, and media. This operation was selected for three main reasons. First, the focus on one area of Committee operations was necessary to achieve an in-depth study, in spite of our necessarily finite research resources. Second, both academic and practice-based sources emphasize how important and challenging the transport operation is at mega-events. It is delivered by a temporary, massive operational system with extreme complexity, related to the transient nature of the event and to the host cities, which usually have significant urban 'base load' travel and congested transport systems (Currie and Shalaby, 2012; Minis and Tsamboulas, 2008). Third, given the decentralized nature of the transport operation, coordinated activity among different teams was essential, making this a fruitful empirical setting in which to explore our research question.

4.2 Data collection

The first author was a full-time volunteer at the Olympics from July to September 2016, and conducted the fieldwork. Data collection involved semi-structured interviews, participant observation, and internal documents. Since our interest was in firm-level coordination, people from the OGOC were interviewed. Through 'snowballing', the initial interviewees enabled access to further respondents. Besides staff within the Transport department, people in other, directly related departments (e.g. Security, Procurement, and Information Technology) were intentionally selected (Miles *et al.*, 2014). We aimed for diversity: interviewees were from various hierarchy levels, responsible for different transport services, and based in multiple Olympic venues. Some had previous experience in mega-events, such as the World Cup and the Pan-American Games. The interviewees' profile is detailed in Appendix 1. In total, 28 interviews were conducted, corresponding to 25.5 hours of recording altogether. The questions focused on understanding the transport operation and its related services, on the evolution of the Committee over time, and on the main coordination challenges and strategies. Most of the interviews were carried out in person and a few by Skype, depending on the interviewees' availability. All interviews were recorded and transcribed.

Another key source of data was participant observation, which enabled an insider perspective and complete contextual embeddedness (Tracy, 2013). The first author's activities as volunteer involved working within the transport team in the Barra Olympic Park, where most of the competitions took place. This entailed duties such as controlling access, managing timetables, giving information, and allocating cars to clients. This enabled observation of ground-level coordination, decision-making regarding operational issues, on-the-spot training, and management of unforeseen situations. The main participants involved were middle-level managers, operational staff, and volunteers. Rich information and perceptions were collected during the working hours and more informally (e.g., during lunchtime). Additional data were collected in documents such as reports, maps, manuals, daily schedules, and operational plans. These documents described operational procedures developed by the OGOC based on the IOC's manuals and guidelines.

4.3 Data analysis

Data analysis was done in three steps: data reduction, data coding, and longitudinal analysis. Miles *et al*. (2014) recommendations on data coding and reduction in combination with temporal bracketing strategy were adopted. The temporal bracketing strategy allowed structuring the description of events in successive time periods. Specifically, this strategy

"permits the constitution of comparative units of analysis for the exploration and replication of theoretical ideas" (Langley, 1999, p. 703). During the data reduction phase, all sources of information (interview transcripts, documents, and field notes) were combined and summarized, focusing on coordination. The second step consisted of the coding process, which allowed the identification of the main challenges and aspects of coordination, based on the literature and on the empirical data. Table 1 presents the final codes, including their definition and representative quotes. Finally, through the temporal bracketing strategy, the operations in each of the Olympic phases were broken down and analysed in detail in order to understand their characteristics and coordination strategies.

[Insert Table 1 here]

5. Findings

We present the findings in four sub-sections. First, we describe the activities of the transport operation and identify some ways in which they differ from those of the previous edition of the Games. We then describe the four phases into which IOC's manuals and procedures divide each Olympic Games. Then, we present the coordination challenges and related strategies adopted. Finally, we explore how formal and informal coordination mechanisms were combined over time.

5.1 The Transport Operation

From August 5th to August 21st, more than 11,300 athletes from 207 countries competed for 306 sets of medals, in 45 Olympic venues in Rio de Janeiro. The transport operation is essential to this, and one of the most complex in the Olympic Games. This is because it is large, multi-dimensional and has to be adapted to the local environment. Furthermore, the continually changing pattern of events on different days requires changing transport provision. The transport operation for all Olympic Games is mostly based on the IOC's transportation manual, which requires transport planners to develop solutions to meet the demands of the Games and of the host city, taking into account previous Games experiences and best practices.

The manual provides general policies and information on clients' profile and related services, requirements on transport infrastructure and facilities, rules related to security and access, transport support services, and traffic management system, to name a few. It also

defines distinct transport systems such as TA – transport of athletes, TF – transport of federations, and TM – transport of media, and the deliverables associated with each. For example, while dignitaries would usually have a dedicated car and driver to take them to the Olympic venues, media clients would need to check timetables and see which coaches could best meet their needs.

The OGOC used two types of transport, coaches and vehicles (cars and vans), to deliver dedicated and shared transport services. In Rio, around 4,600 vehicles were provided by Nissan (one of the official sponsors) and 850 coaches were provided by a bus consortium comprising 32 small and medium-sized local firms. The transport team planned more than 7,000 routes to provide the required services. The workforce consisted mainly of volunteers. Operations were carried out by a combination of centralized teams responsible for more general activities, such as vehicle maintenance and cleaning, and venue-specific teams in charge of delivering the transport services, including access control, transport within the venues, and parking. Some standardized elements were very important to enable this operation. For example, all Games clients and staff had an Olympic Identity and Accreditation Card (OIAC), indicating name, organization, country, type of access, etc. and, importantly for the transport operations, the type of the transport system he/she could use (e.g., TA, TF, and TM). All accredited vehicles had a particular Venue Access/Parking Permit (VAPP). This accreditation was a combination of letters and symbols that identified (1) which type of client was being transported (e.g., athletes, dignitaries, or media); (2) the type of access of a specific vehicle (all venues, specific venues only, outside the venues only, etc.); and (3) if the vehicle had a dedicated parking space.

The IOC's guidelines and rules are common to all Organizing Committees: they were used for the 2012 London Olympics and the 2016 Rio Olympics, and will support the 2020 Tokyo Olympics. However, the manual is clear on the need to adapt the transport operation to the host cities' specificities. Both London and Rio had had experience of planning and delivering several mega-events every year, such as marathons, Carnival, and New Year's Eve celebrations, meaning that there were existing operational plans from which they could build: these had similarities, but also differences. Other specificities arose from the details of the venues and the maturity of infrastructure. First, while in London there were 34 relatively concentrated venues, in Rio there were 45 Olympic venues distributed in four different regions of the city. For example, in London, the Olympic Village was next to the Olympic Park and athletes could walk to several competition venues. In Rio, although both venues were in the same region, they were farther apart, and athletes needed to make a 10-minute bus journey from the Olympic Village to the Olympic Park. To travel between different regions of the city

could take more than 90 minutes. Second, whereas the London Organizing Committee could benefit from the extensive transport network and infrastructure available, in Rio, a new transport network was created. For example, roads and tunnels were built, a new metro line and several bus lines were developed (especially, BRT – Bus Rapid Transit), and a Light Rail Vehicle (LVR) system was created. Third, in Rio, the routes were planned so as to avoid some areas of the city because of security concerns. These aspects did not affect the transport operation in the 2012 London Olympics.

5.2 The Olympic Phases

The Games were organized across distinct phases: planning, venueization, operation, and dissolution. These are described in IOC's manuals and procedures, and differ in terms of operations, activities, and challenges. What follows is a brief description of them.

The *planning* phase lasted from 2009 to 2016. During the early years, the OGOC was a small organization; there were around 50 paid staff in 2009 and 80 in 2010. The Committee increased in size and scope gradually during the subsequent years (Figure 1). During this phase, there were few people from third parties. In subsequent phases, many organizations and individuals joined the operations (e.g., volunteers, public bodies, and service providers).

[Insert Figure 1 here]

Venueization refers to the period immediately before the Games, which started around five months before the opening ceremony. Plans made during the planning phase were activated, translating the unified and centralized structure of the OGOC into individual and decentralized operational units (venues). In this phase, many people were hired to prepare the venues, making the OGOC expand exponentially (from around 2,500 paid staff in 2015 to 6,500 in 2016). The following quote from the former CFO of the London Organizing Committee indicates the complexity involved:

> *"There were multiple challenges, but I think overall delivering a hugely complex event at the same time as building an organization from a small family company to a FTSE 100. For me, those would be the two big macro challenges along with trying to deliver it on budget" (Neil Wood, former CFO of London Organizing Committee for the Olympic Games – BBC Radio 4 talk).*

The *operation* phase refers to the period in which everything planned and structured in the previous two phases needed to actually work. It includes Games-time, but the exact start of this phase varied according to the activities involved. For the transport team, it began in July 2016 and finished in September 2016. Finally, the *dissolution* phase is the 'disassembly' of the organizational structure (workforce, infrastructure, contracts, technology, and the organization as a whole). This phase lasted until the end of 2016, when the OGOC as an organization came to an end; i.e., legal, material, and financial dissolution.

5.3 Coordination in the Olympic phases

Our analysis shows that each phase (1) had distinct conditions that created challenges and (2) utilised both formal and informal coordination mechanisms in varying degrees to address the challenges. These are defined and their illustrative quotes from our data coding are presented in Table 1. In this section we first provide a summary of our findings (Table 2) and then explain them in detail. Specifically, we observed that each phase was characterized by high or low levels of the three coordination challenges of uncertainty, interdependence, and time pressure which in turn influenced the adoption of distinct coordination structures and mechanisms.

[Insert Table 2 here]

5.3.1 Planning phase

The planning process was mostly based on the IOC's transportation manual, which contains guidelines, requirements, and transportation services that need to be provided during the Games. Besides the manual (which is a legacy from other Organizing Committees), the IOC also organizes a formal process of knowledge transfer, which includes meetings and visits. Staff from the OGOC visited many venues during the London 2012 Olympic Games, observing and learning from diverse operations. This also happened in Brazil: during the Games, many observers from Tokyo 2020 Organizing Committee visited the venues and departments. The interviewees recognized that the planning of the transport operation drew on the formal experience from other committees, but they also stressed Brazilian economic, political, and cultural specificities, which demanded many adjustments and different strategies. To illustrate this point one of the interviewees compared London and Rio de Janeiro. *"The lessons learned in one country may not be useful for another country. What worked in London will not necessarily work in Rio"* (Christine – Transport General Manager).

This phase exhibited high levels of uncertainty, which increased the complexity of the planning process. Although some people from the OGOC had previous experience in the organization of mega-events, for most of them, it was the first time. They did not know exactly what was going to happen, how they would operate, and with whom they would be working. Work in this phase involved low levels of interdependence. Overall, the activities developed by the transport team did not involve many third parties. This included planning (of routes, material, workforce, and infrastructure), supplier development, procurement, rehearsal, and development of IT solutions. In the late phases of the planning phase, the interdependence increased, as public and private organizations joined the OGOC. Compared to the following phases, time pressure was relatively low. The interviewees agreed that they had enough time to plan the operation properly, milestones were well defined, and deliveries were monitored by the IOC.

The transport team used a centralized coordination structure, whereby activities and requirements were specified in procedures, handbooks, and previous Committees' reports. Planning was mostly based on these documents, on formal meetings with the clients, and on the formal process of knowledge transfer organized by the IOC. Within the OGOC, weekly meetings were conducted involving different departments in the early phases of the planning and later on involving suppliers, providers, and public bodies. In this phase, formal coordination mechanisms were preponderant.

5.3.2 Venueization phase

For venueization, staff and volunteers were allocated in groups to each venue. The operations included logistics, assembly of temporary structures (e.g., tents, garages, parking spaces), and training. This phase started in March 2016; many interviewees felt this was too late. The time pressure to finish everything before the Games increased the need for coordinated activity.

In each venue, people from public and private organizations and new OGOC staff joined the operation, meaning that most people working in the venues had not participated in the planning phase. They had to understand the processes and at the same time identify ways of improving them and training people accordingly. Therefore, a great challenge was the integration of interdependent tasks. Furthermore, the need for new processes and resources that had not been anticipated emerged, which increased the levels of uncertainty. In this phase, the nature of operations changed significantly: there was an increase in decentralization, number of people and variety of activities. This, in turn, increased the importance and complexity of coordination.

The venueization phase imposed a decentralized coordination structure translated across functional areas in all venues. Tests in this phase led to many changes; new requirements emerged according to which some operational plans were redesigned, and schedules were updated. Formal meetings became less frequent and communication with people in different places was enabled by technology (e.g., e-mail, radios, and mobile phones). In this phase, some informal coordination mechanisms emerged. These included alternate processes due to local requirements at specific venues, new ways of organizing the work, and informal ways of communicating (e.g. via WhatsApp – a free instant messaging application on smartphones). For example, a specific group with the transport team members responsible for different athlete delegations was created on WhatsApp to facilitate information sharing, decision-making, and problem-solving in the venues. Additionally, face-to-face interactions between teams in the same venue intensified. In sum, the organization used a combination of the formal coordination mechanisms that had been preponderant in the planning phase (e.g. plans and schedules) and informal coordination mechanisms that emerged to overcome coordination challenges (e.g. informal communication) as the planned processes were initiated.

5.3.3 Operation phase

During the operation phase, the OGOC required its members to coordinate complex and interdependent activities under severe time pressure across diverse decentralized operational units. The massive increase in number and diversity of people and activities accentuated coordination challenges. Thousands of people (employees of OGOC and other public and private organizations, and volunteers) needed to work interdependently and in synchronization in order to deliver different transport services. These people had different training levels, which made it difficult to coordinate certain activities, including completely new ones such as fleet management, on-site training, and venue management. In addition, people were working under extreme time pressure (e.g., delays could cause an athlete to miss a competition).

High levels of uncertainty challenged coordination during Games-time. There were around 50,000 clients to be transported across 45 venues, based in four different regions of the city. Moreover, 40 events happened simultaneously and the transport team could not always predict the number and profile of people who would go to each competition. This emphasized the need for ‘inter-venue’ coordination. In the venueization phase, coordination was necessary within the venues (internal focus), where different OGOC teams had to interact and develop interdependent activities. In the operation phase, coordination was additionally needed within and between venues (internal and external focus). Since the transport services were delivered

to and from the venues' boundaries, teams from a specific venue had to be aligned with teams from other venues.

Through a decentralized structure, coordination was enabled largely by intensive interaction between people on the ground and by emergent informal mechanisms. Interaction was facilitated by radios, organizational systems, and open apps. Formal plans and rules were treated as overarching principles rather than strictly normative procedures. The start of the operation posed difficulties because some process details had not been completely structured, mainly due to time constraint. This gave rise to some 'grey areas': emergent situations could only be identified during operation, and it was therefore difficult to allocate responsibility for them in advance. In this context, staff from the OGOC typically acted as the main coordinators. If people from a third-party organization could not solve a problem themselves, instead of calling their managers, they turned to members from the Committee to resolve it. Thus, social roles and interactions seemed to be more important than hierarchical relations and procedures.

Staff always needed to make prompt decisions in dealing with clients. An example is how the transport team solved the problem of an unexpectedly high demand in the venue level. They had not foreseen that so many clients would go from a specific venue (Maracanã) to multiple dispersed hotels in the same region (Copacabana). Thus, they had not planned this route for the required number of people. The problem was solved by taking the clients to central areas of Copacabana by buses and then, from these central points, cars took them to their hotels. This decision had to be made very quickly and required a coordinated set of activities because when people got to these central points, cars needed to be waiting for them.

In some cases, people on the ground could not check with their managers before accommodating unforeseen demands and would, instead, make a decision and then report what had been done. For example, one volunteer taking care of a principal access control point had to decide whether or not to allow a truck of food supplies into the Olympic Park at a time when deliveries were not normally allowed. Knowing that food supplies were lacking and that his decision would help to resolve this, the volunteer allowed the truck in, aware that he was breaking the rules by not checking with his manager. He then reported the situation to the manager, who congratulated him. "*If the transport operation did not require people to judge this kind of situation, it would be easy; we could use tags, RFID (Radio-Frequency Identification), and automatic check points to control access. However, we need people's knowledge and judgement to handle this kind of situation, especially in a context of time pressure and uncertainty. In the Olympics, we deal with uncertainty and urgency all the time. Therefore, not everything will follow the rules" (David – Transport Manager).*

More generally, data collected through observation showed that even if the Committee had had several more years to plan, they could still not have anticipated all eventualities because some issues and solutions emerged only during Games-time. Overall, in the operation, procedures had to be redefined and adjusted in an ongoing manner, as new ways of performing activities were incorporated.

5.3.4 Dissolution phase

The dissolution phase was characterized by a systemic approach – the organization as a whole should end. Activities included return of temporary structures (e.g., garages, tents, security grids), conclusion of short-life contracts with people and companies, return of the cars to Nissan, and return of the coaches to the bus consortium. The transport team also had to deal with the aftermath (e.g., traffic fines, insurance issues, and accidents). The main challenge was time pressure because all temporary structures, such as parking spaces, had strict deadlines and expensive fines in the event of delays. Besides that, the temporary contracts of employees were coming to an end.

During this phase, most of the local teams disbanded and staff returned to the centralized structure in the main office. Since the dissolution plan had been fully predefined, formal mechanisms such as plans, contracts, and schedules played a fundamental role to enable coordinated activity. For example, activities were formalized through procedures and schedules, and contracts were designed considering the temporary nature of the operation (e.g., disposal, rental, selling, donation, and disassembly).

5.4 Formal and informal coordination

Varying degrees of uncertainty, interdependence, and time pressure in each phase influenced the coordination mechanisms used. We illustrate this in Figure 2 by showing the relationship between varying degrees of interdependence and the extent to which formal and informal mechanisms were used. The X axis represents the centralized/decentralized nature of the operations of the Olympic phases over time. The Y axis denotes the level of interdependence within the Committee and is assessed by the approximate number of the OGOC paid staff over the years. The development of the histogram was based on the number of codes related to formal and informal coordination mechanisms, taking into account data collected through interviews and daily observation.

[Insert Figure 2 here]

The histogram shows how coordination challenges (in our example, interdependence) influenced the use of varying degrees of formal and informal coordination mechanisms in different Olympic phases. We can note that interdependence changed over time, as did the use of informal mechanisms. In the planning phase (from 2009 to March 2016), there were centralized operations and low levels of interdependence; the transport staff could develop activities without extensive interaction and help from other departments. Activities were supported mostly by formal mechanisms such as plans and procedures. In the venueization (from March to July 2016), there were increasing levels of interdependence between functional areas. Teams that were previously working separately depended on each other to develop their individual activities and needed to work cooperatively to prepare the venues for operation. Informal structures, routines, and communication tools emerged and were used alongside formal plans and procedures.

In the operation phase (from July to September 2016), the levels of interdependence were the highest, resulting from the increase of people, organizations, and operations and from the need for real-time responsiveness. Thousands of people from different departments of the OGOC and from other organizations had to develop interdependent activities jointly and in synchronisation during Games-time. Informal coordination mechanisms such as informal communication and intensive interaction were preponderant and served as an alternative to formal plans that did not work or were not sufficient to handle new demands and the decentralized nature of the operations. Finally, in the dissolution phase (from September to December 2016), operations were centralized and the interdependence was low; i.e. individual teams developed their specific activities in order to complete the dissolution plan. Coordination relied mostly on formal mechanisms such as contracts and schedules.

This illustrates that formal and informal coordination mechanisms are complementary and can be combined over time in order to develop decentralized and temporary processes. Further, our analysis suggests a contingency logic in using these mechanisms determined by the presence of varying degrees of coordination challenges (uncertainty, interdependence, and time pressure). The following section further discusses our findings.

6. Discussion and research contributions

How does operational coordination take place through the various phases of work in temporary organizations? Our findings suggest that operational coordination in temporary organizations dealing with multiple and decentralized operations takes place through both the implementation of formal and emergence of informal coordination mechanisms, which vary relatively according to the phases of the work. To reflect on these findings and stress our contributions, we first discuss 'hybridity' in TOs, meaning that they comprise elements that are enduring as well as temporary and centralized as well as decentralized. This brings unique challenges to coordination. Secondly, we explore 'venueization', a strategy developed by the International Olympic Committee (IOC) to link planning and operation phases. It is a phase in which central structures are translated to operational units, taking account of local specificities. Thirdly, we suggest that, since TOs present different activities and related coordination challenges across various phases of work, the coordination is contingent on the phase of the project. This includes central implementation of formal as well as local emergence of informal coordination mechanisms, in varying degrees over time.

6.1 Hybridity in temporary organizations

Contrary to some views that TOs lack formal and enduring structures due to their limited duration (e.g. Meyerson *et al*., 1995), we empirically show that TOs dealing with multiple and decentralized operations are hybrid organizational forms; i.e., they have enduring as well as temporary and centralized as well as decentralized elements. On the one hand, in the Olympics there were multiple enduring and centralized organizational structures, standards, processes, and relationships. Typical examples are enduring partnerships, guidelines, and formal knowledge transfer processes developed by the IOC in order to maintain continuity and standards across all the Olympic Games. On the other hand, there were finite-life and decentralized organizational structures, processes, and work teams created only to fulfil specific tasks. The OGOC is an example of this hybridity: it has features of enduring bureaucratic organizations such as departments, procedures, and hierarchy relations; yet it also presents dynamism in the form of temporary elements similar to an organic organization (Burns and Stalker, 1966) changing over time to accomplish specific phases. This hybrid nature has important implications for coordination because the requirements in each type of organization (bureaucratic and organic) vary, meaning that different coordination mechanisms might be needed.

Another example of hybridity was the presence of high-level centralized and local-level decentralized structural elements and processes. Given the hierarchical structure of the transport team, the planning was centralized and conducted by people in higher positions (director, general managers, and regional managers) and the execution was decentralized and implemented by people in middle/low positions (venue managers, supervisors, analysts, and volunteers). On the one hand, both high-level activities and deliverables (transportation services) did not change from one venue to the next. All venues had to be prepared to provide all transport services related to the pre-defined transport systems and related clients. For this, there were centralized and overarching process guidelines and standards related to security and access control, waiting times, signage, and accidents, to name a few. These were centralized and enduring elements applied to all venues. On the other hand, the way the services were provided changed. Although all venues had overarching process guidelines, activities had to be adapted at the local level to accommodate venue specificities and unforeseen demands, giving rise to localized elements. Some examples were the Olympic Park, the Olympic Village, and one of the garages as we explain below.

Since there were diverse competition venues within the Olympic Park, transport services had to be adapted. For example: (1) higher frequency of services given the high demand; (2) multiple entries and load zones to take care of different clients and sports requirements within the Park; (3) specific parking spaces considering particular transport systems (TA, TF, and TM); and (4) several checkpoints and increased signage to deal with the complexity of the traffic in the Park. In contrast, the transport operation and related services in the golf course were much simpler. Further venue-specific requirements were observed in the Olympic Village. Given the size of the athletes' accommodation venue, specific internal transport services were necessary. For example, a 'circular service' was added, which went around the Village during the whole day so that the athletes could easily reach different points (e.g., restaurants, transport mall, leisure areas, and social events). This service was not available in any other venue. Finally, in the garage located near the Galeão International Airport, even though radio had been defined centrally as the standard channel of communication and information sharing, alternative methods of communication were adopted by staff and volunteers because the airport activities disrupted the radio signals.

Our data suggests that the use of localized elements in combination with centralized ones in the venues were defined at different organizational levels in planned and emergent ways, which then required coordination efforts. It seems that more unforeseen and venue-specific adaptations led to the adoption of more emergent elements. Venues varied in the extent to

which they adopted the overarching central plan as opposed to adapting to (foreseen and unforeseen) local requirements, at different hierarchical levels. We suggest that this difference between venues could be captured in a measure of hybridity[1], which could be useful in practice as a way to characterise venues, in the specific context of the Olympics, as well as more generally. Examples of variations at different hierarchical levels in the Olympics are as follows: high-level variations (Director) – all transport services required by the IOC should be provided taking into account the host city's specificities (e.g., unsafe areas of Rio had to be avoided in the overall operation); middle-level variations (Venue Manager) – each individual venue should be able to operate given individual particularities (e.g., several operational adaptations had to be undertaken in the Olympic Park given its complexity in terms of size and diversity of competitions); low-level variations (staff and volunteers) – operational workforce should be able to operate under time pressure and respond to local contingencies (e.g., operational adjustments had to be undertaken on the ground in diverse venues). Characterising venues different levels of variations throughout the hierarchy as well as the recognition of hybridity (presence of temporary vs. enduring and centralized vs. decentralized elements) as captured in a measure of hybridity, could inform the choice of specific managers for different venues based on their management style or experience, or other operational decisions such as prioritising some venues for early venueization.

Although the presence of enduring elements in TOs has been acknowledged (e.g., Holguin-Veras *et al.*, 2012; Grabher, 2002), it has been a relatively underdeveloped theme, as most of the TO literature concentrates on more temporary and emergent aspects. By exploring the interplay between temporary and enduring elements over time, we have shown that not only do these elements exist simultaneously, but also that they change to meet requirements of specific phases of work in TOs. The Olympics was a rich empirical setting to understand these dynamics. Based on our findings, we suggest that TOs dealing with multiple and decentralized operations are inherently hybrid as they comprise enduring as well as temporary, and centralized as well as decentralized elements. Furthermore, we argue that since TOs usually have multiple phases, including planning and operation, hybrid elements change across different phases of the work. While in the planning, there are more enduring and centralized structural elements and processes, in the operation there are more temporary and decentralized ones. These findings are summarized in the following propositions:

[1] We thank the Guest Editors for suggesting this.

Proposition 1: Temporary organizations developing multiple and decentralized operations will require a hybrid mix of elements (temporary vs. enduring and centralized vs. decentralized), which changes over time to accomplish requirements of different phases of the work.

Proposition 2: Planning phases of work will require more enduring and centralized elements and operation phases will require more temporary and decentralized ones.

How do we link these elements and phases? Based on the empirical setting investigated, we argue that venueization might be this linking mechanism.

6.2 Venueization: transition phase in temporary organizations

Venueization is the IOC's formalized term for the transition phase in which Olympic venues are made ready to operate. Jacobsson *et al*. (2013) claim that the role of transition has been downplayed in the theory of TOs (Lundin and Söderholm, 1995), and argue that it should be given a more central place. In their approach, the temporary organization (in the form of internal projects) is a transitory unit within the permanent organization. This is a useful insight into the relationship between temporary internal projects and the permanent organization. We build on this to examine in depth *how* transitions take place in TOs, by exploring venueization.

Venueization took the Organizing Committee from centralized planning to operation in multiple locations, and involved linking hybrid elements. It was primarily about applying centrally planned (already-adapted) structures to individual units, testing whether these really met local requirements, and further adapting them as needed. In order to do so, it often required redesign of operational plans, schedule updates, multi-divisional coordination, training, and management of intersections between centralized and decentralized elements. The OGOC had to undertake at least 45 different venueization processes, leading to high levels of complexity, as multiple projects happened simultaneously in a decentralized manner under strict time constraints. This involved high levels of face-to-face interactions among different work teams, learning from trial and error, and the emergence of informal structural elements.

Our findings show that venueization was a necessary link between planning and operation. Although studies have focused on these phases individually, or examined knowledge transfer and learning between successive projects (e.g., Söderlund and Andersson, 1998), less attention has been given to the processes linking planning and operation. In some contexts, however, they have been explored, using the concepts of tailoring and deployment. In concurrent engineering, tailoring refers to the customization of processes and structural elements to match

specific programme priorities and product characteristics (Swink, 1998). Tailoring in software development is defined as the adaptation of the method to the culture, objectives, environment and reality of the organization adopting it (Campanelli and Parreiras, 2015). It involves selecting or adapting software practices and can relate to stakeholders, project life cycle, project organization and knowledge building (Bass, 2016). Similarly, the deployment strategy involves replicating and adapting organizational elements (e.g., processes and teams) to a given situation. In the context of the Dutch Armed Forces for crisis response operations (Waard and Kramer, 2008), deployment involves a process of repetitively assembling tailor-made temporary units to develop a specific mission. In Project Management (PM), PM deployment includes the acceptance and adoption of the PM discipline by individuals and groups, which is influenced by cultural factors (Bredillet *et al*., 2010).

Venueization is a particular form of tailoring and deployment, but with extreme characteristics due to rapid implementation among numerous, inexperienced and diverse staff and volunteers. This makes venueization distinctive in at least three ways. Firstly, in our particular setting, venueization was a messy and complex phase that involved joint work of diverse people and organizations aiming at multiple and overlapping objectives. Tailoring and deployment seem to be more straightforward approaches that have very specific objectives. Secondly, these approaches very often involve a team with enduring membership and common ground (Srikanth and Puranam, 2010) technically and organisationally – i.e., the deployment is usually from one set of professionals to another. Venueization in the Olympics involves implementation through a large number of recently recruited temporary staff and volunteers. This context is very extreme in that respect, which involves messiness, trial and error, and emergent elements. Our data showed that people executing the tasks were relatively unfamiliar with what they were doing. What is more, even the ones who participated in the planning phase had to test the specific plans, get them wrong, train people, learn, incorporate emergent elements, and adapt organizational arrangements, so that they could end up with a process that actually worked in a specific venue (scenario/context). Thirdly, while in a lot of projects the objective is to deliver an 'end product' once the prototypes have been trialled and adapted, in the Olympics, the process is what is delivered. Venueization is a key phase to design and adapt this process. However, the 'end product' of venueization is not a perfect ready-to-work process. Emergence and adaptation are core aspects for venueization and are also ongoing aspects that are part of the delivery of the 'end product' in the operation phase.

In a general sense, venueization can be seen as a process for creating a local, venue-specific temporary mini-operation based on centralized principles, plans, processes and structures. A

venueization is successful when it results in an operational unit that, in the operational phase, can deliver the required service to satisfy objectives of quality, delivery and cost, and which is sufficiently flexible to cope with unexpected changes in demands or internal resources. Thus, a theoretical exposition of venueization should identify parameters that determine whether a venueization will be successful in these terms. Two parameters seem particularly important here: duration, and management and leadership.

The first important parameter is duration. Most of the interviewees mentioned that they had a late venueization and because of that, they did not have enough time to implement, test, and adjust processes accordingly. This, in turn, led to many problems during Games-time, such as lack of necessary resources and people, conflicting information, and incompatible IT systems. As a result, staff had to be hired during the operation because there were not enough volunteers to fulfil all the operational needs, and informal IT applications were incorporated into the routines as people could not use the formal systems that had not been configured in time to support their processes. These led to additional costs and affected the delivery and quality of services. Venueization then, should be long enough to (1) apply, test, and adapt structures and processes, (2) train people properly, and (3) allow the emergence and incorporation of informal elements in a 'safer' (test) environment. Venueization affects subsequent coordination and, if successful, should result in an appropriate and effective combination of formal and informal coordination mechanisms. Informal mechanisms are an important source of flexibility, but a rushed venueization can result in over-dependence on untested informal mechanisms and consequent operational failures. However, venueization should not be too long because it is costly: the organization incurs labour and other costs during the venueization and, even with volunteers providing much of the labour in the Olympics, the volunteers themselves only had a limited capacity to give of their time.

The second parameter is management and leadership. Data collected through observation showed that the skills and experience of key team members who had participated in the planning phase were important in transforming plans into operational units. In order to develop a successful venueization, it is necessary to have managers able to lead, motivate, and manage a diverse mix of people in order to capitalize on their abilities, and to support, promote, and encourage the incorporation of ideas and solutions in order to achieve operational outcomes. The venueization process is ultimately important to reduce uncertainty and to build organizational resilience: in other words, the ability to prepare for, identify, react to, and recover from unexpected situations maintaining continuity of operations. Based on these observations, the following propositions are developed:

Proposition 3: TOs developing decentralized and multiple operations will require a venueization process, in which central structures are translated to operational units or individual projects taking into account local specificities.

Proposition 4: There is an inverse 'U' relationship between venueization duration and success in terms of subsequent operational performance (quality, delivery, flexibility, and costs).

Proposition 5: Continuity of management and leadership between planning and venueization will lead to better performance in the operation phase.

Proposition 6: Successful venueization will give rise to an appropriate combination of formal and informal coordination mechanisms in the operation phase.

6.3 Combination of formal and informal mechanisms

In the Olympics, the transport team needed to deal with competing demands imposed by different phases and by the dichotomy of managing individual and autonomous operational cells that were simultaneously also parts of a bigger organizational structure. The tension between being congruent with the IOC's objectives and the OGOC's hierarchical structure as well as being responsive and agile in delivering the required services and accommodating unforeseen demands, made coordination a big challenge. Despite the opportunity for planning formal and structured coordination mechanisms afforded by the relative predictability of the Olympics, informal and emergent elements were still very important. We evidenced how varying degrees of formal and informal mechanisms were combined throughout the Olympic phases to enable coordinated activity at the operational level.

We propose that the hybrid nature of TOs, established earlier, also affects coordination. While scholars suggest that coordination in TOs relies primarily on informal and interpersonal mechanisms (e.g. Hanisch and Wald, 2014; Bechky, 2006; Pauget and Wald, 2013), we show that this is not always true. The simultaneous existence of formal and informal mechanisms to varying degrees means that coordination depends on the phase of the work and, more generally, has a contingent nature, being situated and driven by the requirement for accomplishing the final task. Our data showed that coordination mechanisms tend to be more formal and structured during the planning phase and that informal coordination mechanisms are predominant in the operation phase. The latter often result from innovative solutions from people 'on the ground'.

However, even if the execution of specific processes might be adapted and improvised depending on the circumstances of a particular moment, the ability to do this was underpinned in various ways by standardisation. This may seem paradoxical (cf Browning, 2014), but the availability and widespread understanding of key process building-blocks, such as formal classification and identification of individuals and vehicles which determined their access rights and other privileges (e.g, TA – transport of athletes and TM – transport of media), made flexibility in delivery possible. The vast majority of staff were volunteers, who had joined the organization a few weeks earlier (at best) and received relatively little training. As such, these standard elements are particularly important, as they allow quick, flexible implementation under possibly volatile demand conditions, while preserving the quality of the process in terms of the key parameter of who is allowed which privilege. This could be understood from a modularity perspective as a use of 'visible design rules' (Baldwin and Clark, 2000) to facilitate the flexible combining and recombining of process elements, even when the amount of common ground between staff was relatively limited (Srikanth and Puranam, 2010).

Our findings support the view that formal and informal mechanisms are complementary, rather than contradictory (Hanisch and Wald, 2014; Majchrzak *et al*., 2007). However, while the literature suggests that informal mechanisms are the primary focus, we show that both types of mechanisms are equally required to enable coordination in TOs. Furthermore, we also examine how they are combined over time, and introduce a contingency logic to explain how formal mechanisms can be centrally implemented and informal mechanisms spontaneously emerge, as a result of varying coordination challenges in different phases of the work. In short, the traditional concept of operational coordination (Van de Ven *et al*., 1976) in TOs needs to consider contingency because of temporariness. Coordination in temporary settings has a contingent nature.

The Committee's size also influenced coordination. It expanded massively in terms of staff, volume of operations, and complexity; it started as a small organization and became a big company. In this process, we could identify the emergence of informal mechanisms while the organization was rapidly getting bigger. However, the current understanding of the relationship between coordination and size is that small organizations use improvisation first and when they get bigger usually turn to a standardized and bureaucratic structure. Here, we have the opportunity to rethink the contingency argument on size (Van de Ven *et al*., 1976). While it is broadly agreed that bigger companies favour formal coordination mechanisms, we found that a big organization developing decentralized operations in a temporary setting relies broadly on informal coordination mechanisms. Our results suggest that coordination mechanisms change

in response not only to changes in environmental conditions but also in response to changes in the organization itself. It was not simply a matter of designing coordination mechanisms in response to the environment. The decentralized nature of the organizational structure brought about emergent and informal coordination mechanisms. The following propositions reflect these insights:

Proposition 7: As they grow, decentralized TOs will use increasingly informal coordination mechanisms.

Proposition 8: Formal and informal coordination mechanisms will be used complementarily and contingently depending on the phase of work.

Proposition 9: Increasing levels of time pressure – determined by non-negotiable deadlines – will increase the use of informal coordination mechanisms.

Proposition 10: Increasing levels of temporary and decentralized operations will increase the use of informal coordination mechanisms.

7. Conclusion: examining a 'new' context through an 'old' theory

In investigating coordination in TOs, this paper examined a 'new' context, which is that of temporary organizations, through the 'old' Contingency Theory (e.g., Galbraith 1973; Lawrence and Lorsch, 1967; Thompson, 1967; Van de Ven *et al*., 1976, Van de Ven *et al*., 2013). Traditional theories on coordination focus on formal and informal coordination as contrasting alternative mechanisms and tend to portray trade-offs between them (Bechky, 2006). However, TOs are diverse (Maylor, 2010; Meredith and Mantel, 2008) and can present different levels of variety, complexity, and uncertainty (Maylor *et al*., 2015, Ramasesh and Browning, 2014). Drawing from Contingency Theory as the sensitizing theoretical lens to consider these types of differences, we show that not only are formal and informal coordination mechanisms contingent on the phase of work in TOs, but also that they exist simultaneously and to varying extents. We have found a hybrid mix of elements; i.e., enduring as well as temporary and centralized as well as decentralized. What is more, this mix changes over time to take care of specific objectives of different phases. The same organization went through at least three different organizational structures over a relatively short period (from March to September 2016) because of the changing mix of elements. Our longitudinal research design was particularly relevant for these investigations.

The OGOC increased in size, including a short period of rapid ramp-up (March to August 2016) and, in the process, informal mechanisms emerged to support complex and high-volume

operations. This happened especially because of the decentralized and temporary nature of operations, and the period of rapid scaling-up. This suggests that, in TOs, there is a need for careful interpretation of the typical CT argument that coordination becomes more formal as organizations grow. Formal hierarchical coordination takes time to put in place and, if there is not time, or the incentive of a long-term organizational future, it may not be implemented. In other words, we argue that the causal mechanism between size and structure is not automatic or frictionless, and this is particularly apparent in TOs.

Another interesting aspect relates to knowledge creation and learning in temporary settings. We have evidenced that lessons learned and successful practices from previous Organizing Committees were codified and documented into processes for future events especially in the form of the IOC Transportation Manual, feeding back into the central, enduring operation. However, several meetings as well as visits through the IOC's Olympic Games Knowledge Management Programme were also necessary to transfer knowledge between Organizing Committees. Relating to coordination, we can argue that while some mechanisms can be codified, documented, and standardized to all Olympic Games (e.g., procedures on how to transport a dignitary), others are context-dependent and are not completely transferable (e.g., how to deal with traffic incidents during Games-time). In other words, observation, understanding, and 'translation' of practices (rather than replication) are necessary. Host cities are usually very different in terms of infrastructure, resource availability, and culture. By observing, people can learn what is being done, but it does not mean they are going to replicate it. It means that they are going to understand and absorb it, and then apply it to their context. The measure of hybridity we have previously proposed could be useful to understand the depth of penetration of centralized processes.

Although we recognize that our findings are limited to the context in analysis, we believe that this paper provides a generalizable basis for future research to explore the dynamic nature of operational coordination in TOs and in rapidly changing contexts more broadly. Specifically, we believe that our findings in regard to (1) the hybrid nature of processes, (2) the contingent use of complementary coordination mechanisms over time and (3) the usefulness of the venueization phase might be generalizable to other temporary organizations dealing with multiple and decentralized operations. These conditions are true for many kinds of TOs such as disaster relief teams, theatre groups, and task forces. In all of these, there is usually a centralized structure that plans, strategizes, and organizes the work, and then there are decentralized structures to deliver.

This study has revealed factors that may influence the use of informal mechanisms: (1) how rigid and demanding the time constraints are, (2) how decentralized the operations are; (3) how rapidly the workforce scales up, and (4) how technically difficult and/or regulated the work is. We need to understand further these variables because in some temporary settings, where professionals are strongly guided by professional norms, techniques, and codes of practice, there might be limited scope for informal mechanisms. Future studies could examine coordination of TOs in different contexts in order to investigate if the patterns we observed in the Olympics can be transferred to other types of TOs. Another interesting research avenue is related to venueization. Future work could further investigate the factors determining the success of this phase, its impact on the operation phase, and in different contexts. Additionally, knowledge transfer and capability-building seem to play a fundamental role in translating planning to operation. These literatures could provide further understanding on venueization processes. Finally, we have concentrated on the intra-organizational coordination issues, but are well aware that temporariness has implications for inter-organizational coordination as well. This provides another avenue for further research.

Based on our findings, we hope that both scholars and practitioners can better recognise the challenges of managing in temporary organizational settings and developing intra-firm coordination strategies. They might also benefit from this study by understanding venueization and therefore better plan for and execute transition phases.

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Appendix 1 – Interviewees' profile

[Insert Appendix 1 here]