

**ORGANIZATIONAL CONTROL RATIONALES IN KNOWLEDGE-INTENSIVE
ORGANIZATIONS: AN INTEGRATIVE REVIEW OF EMERGING TRENDS**

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ABSTRACT

This paper uses a complete review of organizational control configuration (OCC) literature to illustrate the complexity and dynamics of control in knowledge intensive organizations (KIOs). Based on interdisciplinary analysis of the extant literature on OCC, the paper offers a comprehensive look at the "control pathway" taken by the various KIOs, as defined in Blackler's (1995) typology of knowledge organizations. By means of this integrative review of existing theory and research, the paper argues for greater attention to KIOs' control rationales in OCC theory and research. In doing so, it offers a comprehensive conceptual framework for the study of control in KIOs and suggests a number of propositions for future research.

KEYWORDS

Organizational control; knowledge-intensive organizations; control configurations; control rationales; conceptual/theoretical; public affairs; public policy; governance

The notion of an organizational control configuration (OCC) —defined as a set of systems, rules, practices, values and other activities used to convey how individuals at every level within an organization must behave to achieve the organization’s objectives and perform at a satisfactory level (Malmi & Brown, 2008) in knowledge-intensive organizations (KIOs) has attracted increased scholarly attention in recent years (Cardinal et al., 2004; Foss, 2007; Martin-Rios, 2016a; McCarthy & Gordon, 2011; Robertson & Swan, 2003; Turner & Makhija, 2006). OCC is of utmost relevance for public affairs and governance. This special issue is a reflection of that expanded interest and concern. Public affairs is a knowledge intensive activity that critically depends on knowledge and does not lend itself to being managed by traditional measures. For example, Mezner and Nigh define it as “the organizational function responsible for maintaining external legitimacy by managing the interface between an organization and its socio-political environment” (1995-975). Moreover, van Schendelen (2012) conceptualizes public affairs management as the effort to bridge and promote adaptation between the internal organization and the outside public policy. Several authors have identified the foundations of control in KIOs as being inherently distinct from those in traditional hierarchical settings (Davila et al., 2009). Scholars have made important theoretical contributions in this regard by specifying the impact that such differences should have on OCC. Yet, despite their significance, organizational-level understanding of OCC in KIOs, including public affairs, remains largely fragmented and incomplete.

One difficulty is associated with the definition of KIOs itself. The ambiguity of the term “KIO” stems to a large degree from the ambiguity of the term “knowledge-intensive”. In his seminal conceptual framework, Blackler (1995) distinguished between four types of knowledge work and organizations depending on their focus on individual vs. collective endeavor and novel vs. familiar problems. Yet, studies regarding control in KIOs either draw on the more general

definitions of the organization (e.g., post-bureaucratic, collaborative) in order to help them understand the challenges they face (Foss, 2007; Heckscher & Adler, 2006) or they focus on a particular type of organization, for example project-based organizations, professional service firms or high-technology firms (Baron et al., 2001; Hodgson, 2004; Robertson & Swan, 2003). None of the studies explicitly addresses how OCC vary depending on the type of organizational and work process contexts.

In terms of control norms and mechanisms in different KIOs, we lack a comprehensive understanding of the dynamic, multidimensional nature of OCC. These systems are a complex construct that may include multiple and simultaneous rationales of control (Ouchi, 1979). Control rationales include formal controls such as administrative control practices (e.g. individual performance management), along with more socially based controls such as norms and values that influence individual behavior. One missing aspect in the KIOs literature is the relationship between these differing formal and informal control rationales (Martin-Rios, 2015). This is critical for public affairs (McGrath et al., 2010), public policy and governance (Tan, 2014) and new public management (Martin-Rios, 2016b) because when the various OCC or rationales in an organization are not balanced and integrated, they can be a source of dissatisfaction, conflict, and stress for their members and related negative economic consequences for the organization (Cardinal et al., 2004).

Several voices have called attention to the contradictory use of different OCC in KIOs (Hodgson, 2004; Kärreman et al., 2002; Maravelias, 2003), suggesting a fruitful area of scholarly inquiry. Yet, the bulk of organizational and human resources research continues to analyze OCC in KIOs while ignoring the complex organizational requirements of these settings (see for example Turner & Makhija, 2006). One plausible explanation for the contrast between the theoretical and empirical literatures may lie in the lack of a rigorous overview of existing research analyzing

control in KIOs from an organizational perspective. Therefore, a comprehensive discussion is needed that includes all available rationales of control and that provides a more general and organizational framework. With this theoretical paper we offer an integrative review of current theory and research relating organizational control systems to organizational models of KIOs; special focus will be placed on control configurations. In this way, we portray the strengths and gaps in the existing literature and offer opportunities for future research in the field.

KNOWLEDGE WORK AND KIOs

Knowledge plays an increasingly central role in organizations. Yet, the distinction between knowledge work and traditional non-knowledge work is not self-evident as any organization involves some kind of 'knowledge'. Hence, for this study, what makes them different is that in more traditional organizations knowledge is a scarce resource and concentrated in certain individuals, inhibiting knowledge interchange while in KIOs knowledge from all parts is critical to organizational success (Alvesson, 2004). As such, there is not a unique nor unanimously accepted classification of KIOs (Starbuck, 1992). Rather, there are several different views depending on the role and use that the organization makes of their employees' knowledge (Alvesson, 2004). A commonly used definition is Alvesson's, which refers to firms which are KIOs as "companies where most work can be said to be of an intellectual nature and where well-educated, qualified employees form the major part of the workforce" (2000, p.1101). Such definition is, indeed, quite broad in scope because it encompasses a large number of conceptually different organizational types and can be potentially be assumed to comprise most work conditions. One of the most comprehensive typologies of knowledge organizations is offered by Blackler (1995). Blackler develops a typology of organizations and knowledge types based on

whether the emphasis placed by the organization is on contributions of key individuals or collective endeavor, and whether the focus of the organization is on familiar problems or a novel problem. As Figure 1 illustrates, Blackler proposes a switch in emphasis from ‘knowledge’ as object to ‘knowing’ as process and, in doing so, he explores how these various types of knowledge can be integrated into the four different types of knowledge organizations. He distinguishes between organizations which “first, are focused on problems of a routine kind versus those that are preoccupied with unfamiliar issues and second, depend heavily upon the contributions of key individuals versus those who are more obviously dependent upon collective effort” (1995, p.1029). Most knowledge work can fall in more than one category depending on several contingencies. For example, an organization involved in public affairs, for example, may exhibit distinctive features across organizations, as Adler and Kwon claim, depending on “its individual professionals (their autonomy, expertise, values, identities, and ties), professional organizations (their strategies, structures, cultures, skills, and systems), and the broader institutional field (professional associations, accountability demands, and competition)” (2013, p.930).

Insert Figure 1 about here

According to Blackler’s typology, the first category is defined as a ‘knowledge-routinized organization’. This form of organization relies on a rather traditional hierarchical division of labor and control that is the result of the reification of organizational wisdom in technologies, rules, and procedures. High-technology manufacturing and several bureaucracies in the public sector stand with the healthcare and the legal professions as the best examples of knowledge-routinized organizations (Adler and Kwon, 2013). At the individual level, middle management is often regarded as knowledge-routinized work in most KIOs (Martin-Rios, 2016a).

The second category identified by Blackler is 'expert-dependent organizations'. Organizations in this group build on the embodied competencies and performance of their key members. Embodied knowledge is defined as "action oriented and (...) likely to be only partly explicit" (1995: 1024). Emphasis is placed on the contribution of key individuals to solving familiar problems. That way, prominence given to individual experts is balanced with a sense of unity through which people may obtain a clearer understanding of what the others are doing and with enhanced communication across functional levels. Professional bureaucracies in universities and public research organizations (Martin-Rios & Heckscher, 2014; Martin-Rios 2016b), professional sports (Erhardt et al., 2014) or and tourism and restaurants (Erhardt et al., 2016) are examples of expert-dependent work organizations.

The third category is 'communication intensive organizations'. These organizations place emphasis on collective endeavor so as to focus on novel problems. To do so, they place their emphasis on communication, collaboration and empowerment by means of integrating collective understanding and the encultured knowledge—this category of knowledge is defined as "the process of achieving shared understandings" (1995: 1024). Organizations characterized by adhocracy or innovation-mediated production such as high reliability organizations (Rubinstein et al., 2016), creative industries (Martin-Rios & Parga-Dans, 2016a, 2016b; Morris, Farrell & Reed, 2016) and multidisciplinary, temporary and virtual teams (Erhardt et al., 2016) represent examples of communication intensive organizations.

The fourth category in Blackler's classification is the 'symbolic-analyst-dependent organization' type. In this category, organizations place emphasis and depend on the embrained knowledge of key members as "knowledge that is dependent on conceptual skills and cognitive abilities" (1995: 1023). New technology-based firms (Martin-Rios & Erhardt, 2017) and

professional service firms including engineering and management consulting, architecture, software development and IT services or marketing/advertising are examples of symbolic analyst-dependent knowledge organizations (Von Nordenflycht, 2010). As such, these firms promote an organizational culture that encourages individual success and a strong sense of belonging to the firm. Work in professional service firms is an example of this category.

Overall, there is consensus that knowledge-intensive work challenges widely held beliefs about how firms should be structured and managed (Bell, 1973; Drucker 1988). There is also a growing view that KIOs require alternative organizational forms to traditional OCC (Alvesson, 1995; Heckscher, 2007; Rennstam & Kärreman 2014). The expectation is that literature on organizational control acknowledges differences across KIOs, as represented in Blackler's typology. However, to our surprise, most theoretical and empirical works on the subject have failed to do so. There is a need for an integrative review of the literature to illustrate the complexity and dynamics of control in organizational models of KIOs. Thus, we will draw on this typology in the remainder of this study to examine OCC in KIOs.

OCC: MECHANISMS AND RATIONALES

OCC can be defined as a configuration of norms and mechanisms that convey the way individuals at multiple levels within an organization must behave to achieve the organization's objectives and improve performance (Merchant, 1985; Simons, 1995). This definition summarizes the key elements of an OCC that may include multiple and simultaneous rationales of control (i.e., administrative, coercive and normative) and levels (top-down, lateral or self-regulating), with different consequences for individual and organizational effectiveness (Simons, 1995). In so doing, this work builds on the notion that OCC are complex (Bradack & Eccles 1989; Ouchi 1979)

and dynamic (Cardinal et al. 2004; Simons 2005). In this way, it is deliberately broader than the more traditional definitions of control, which focus exclusively on certain rationales and levels of control (e.g., Eisenhardt, 1985; Ouchi, 1977, 1979; Snell, 1992).

The notion of OCC has received considerable attention in the literature. Multiple areas of study have explored this concept and its consequences on the management of people: sociology (Giddens, 1984; Weber, 1999), management (Kanter, 1993; Ouchi, 1979; Taylor, 1911), strategy (Govindarajan & Fisher, 1990), accounting (Baxter & Chua, 2003), or human resources (Snell, 1992). Although several approaches to control are possible, we have organized the field around three control rationales: formal/administrative control; coercive control and; informal, normative or social control. Table 1 summarizes some recent research on the three streams.

Insert Table 1 about here

These three rationales may, and often do, coexist in a given OCC. In fact, several authors talk of certain coercive and administrative mechanisms of control indistinctly. Social, normative sources of control often stand as distinct sources of control. Recent work has begun to explore the coercive side of normative control and its effects on employees' organizational commitment (De Jong et al., 2014; Martin-Rios, 2015), group cohesion (Adler & Chen 2011), and accountability (Martin-Rios, 2015).

Three rationales of control

Administrative: Several terms in the literature relate to the administrative logic behind OCC: managerial control systems (Bateman & Snell, 2007), management control (Malmi & Brown, 2008), cybernetic control (Beer, 1966), organizational control (Gomez-Mejia, Cardy & Balkin,

2004); or controlling (Schermerhorn, 2007). Generally, these approaches to control rely on cybernetic control (Aldrich, 1999), defined as a top-down model of behavior production. Drawing on Wiener, Hofstede (1978: 451) defines cybernetic control as "[...] a process which uses the negative feedback loop represented by: setting goals, measuring achievement, comparing achievement to goals, feeding back information about unwanted variances into the process to be controlled, and correcting the process." The traditional cybernetic control cycle does not explicitly define the mechanisms of a control system, but rather defines the formal control process, such as the performance measures and incentive compensation systems. Cybernetic control relies on the following three assumptions: there is a standard, corresponding to effective and efficient accomplishment of the organization's objectives; actual accomplishment can be measured; and the standard can be compared against the measurement and variance information fed back to eliminate unwanted differences between measurement and standard in the future (Hofstede, 1978: 452). A large majority of classical works on control in organizations reflects such a perspective from the cybernetic tradition (Bradach & Eccles, 1989).

One of the main uses of the cybernetic paradigm in organizations is *Management by Objectives* (MBO). The literature on MBO suggests assumptions of rational connection between means and ends, of measurability, and of unambiguous attribution. This prospective OCC is forward looking in that it offers incentives for organizational actors to meet goals determined in advance (Locke and Latham, 1990). Its governance logic relies on defining "objectives [that] are needed in every area where performance and results directly and vitally affect the survival and prosperity of the business" (Drucker, 1954). Work objectives for individuals (the key unit of performance) are based on the principles of predictability, homogeneity, and compliance with the rule through which to attain measurable work outcomes (Merton, 1940). In that regard, MBO-

infused control systems exemplify the manner in which price and authority are efficient means of assessing and rewarding work outcomes and behavior modifications in organizations (Drucker, 1954; Sloan, 1964). Most empirical research on OCC has drawn directly or indirectly on the MBO logic of control (Martin-Rios and Erhardt, 2008).

Following the seminal work of Thompson (1969), Ouchi suggests that organizational structure determines the form of OCC (1977: 95). Increases in organization' size and complexity create a problem of integration. This problem may be resolved by the establishment of a OCC which consists of two elements: on the one hand, "a set of conditions which govern the form of control to be used" and, on the other, the system itself containing "a process for monitoring and evaluating performance" (1977: 96). The process of control centers on two phenomena which can be observed, monitored, and counted by management: behaviors and outputs. These forms of control can be related to an ideal organizational mode—i.e. market (with control based on price) or hierarchy (with control based on authority) (Coase, 1937; Williamson, 1985; Bradach and Eccles, 1989). In general, behavioral control relies on authority mechanisms—‘what you have to do to achieve the goal’—and output control relies on price—‘what you actually do’ (results). Some authors, however, argue that hierarchical control is more central to organization. According to Williamson "hierarchy is its own ultimate court of appeal" (1996: 98). Similarly, Ouchi (1977: 97) points out behavior control is the essential form of control in organizations and so, output control is part of the behavior control "although the means is by selectively rewarding certain of his outputs." Hierarchical control, including variants of MBO, assumes that processes and outputs are readily visible to those in authority.

Coercive: Additionally, there are several studies on control practice that look at power and inequality issues in organizations (e.g. Braverman, 1974; Barley & Kunda, 1992). Researchers

working in this perspective consider control to be an instrument that enables control by management over lower-level employees (see for example the special issued published at Administrative Science Quarterly on the radical perspective on organizational control in 1998). The main argument is that certain control mechanisms, such as performance management tools, are not simply tools to improve performance but rather vehicles creating and perpetuating inequalities between workers and managers. Most of the critical or Marxist literature on management has criticized the MBO governance model without, however, offering an alternative. The critical approach starts from the assumption that the interests of workers and managers are never congruent, at least in the formal arena. Barlow's analysis of performance management systems as an image of perpetuation of power in bureaucratic terms is illustrative (1989). Using Etzioni's (1961) dichotomy between utilitarian and normative control, Barlow describes performance management as an inefficient tool to measure an employee's performance but a powerful tool to define and perpetuate managers' rational-legal ideology. Whatever their validity, such critiques fail to acknowledge that *some* control system is essential for the functioning of organizations and for everyday life.

Normative: In cases when processes are unknown and outputs indeterminate, some note that management utilizes informal, ritualized, or *social control* (Eisenhardt, 1985; Govindarajan and Fisher, 1990). Studies in OCC often fail to reconcile the hierarchical logic with the informal or social system and the latter has been often dropped from theoretical models and empirical analysis (Eisenhardt, 1985).

Moving forward, literature on OCC in KIOs falls in the three rationales, yet overwhelmingly so in the social and normative. There are theoretical and conceptual reasons for this bias toward one rationale. In the remainder of the text, we address this question. By way of reviewing the

literature, a complete picture is presented of how control in KIOs is being addressed. We point out a main problem and opportunity for future research that arises with the absence of more scholarly work on multidimensional OCC.

CONTROL IN KIOs

As often happens with a field that attracts a great deal of attention, the literature on OCC in KIOs has become increasingly confused as the number of scholars who research it has increased. The main source of confusion is a proliferation of definitions of OCC that have proved difficult to combine or reconcile. Integrative efforts have organized the literature around different focal constructs so that what is taken as control varies and what are taken as control's sources and mechanisms also vary (Martin-Rios, 2015). Contemporary analyses of OCC tend to treat it either as a multidimensional phenomenon or as a latent construct with multiple indicators (Davila et al., 2009). However, this contemporary multidimensional/multi-indicator approach to OCC does not address the problem of integrating the three control rationales. While it yields powerful insights, multidimensional OCC often relies on rather static typologies of control systems and is less preoccupied with the role that internal system processes and formal-informal dynamics play on the design and implementation of control mechanisms (Cardinal et al. 2004).

The definitional confusion in the OCC literature is symptomatic of the complexity involved in reciprocally linked formal-level (administrative and coercive control rationales) and informal-level (normative rationale) phenomena. Elucidating the mechanisms involved in this linkage is a generic problem that has challenged scholars in a variety of substantive domains (Adler et al., 2008; Ditillo 2012).

Administrative, including administrative control (as reflected in standard hierarchical logic) and coercive rationales allow organizations to implement organizational controls concerned with the effects of individual and group-level conditions on individual output; but these practices do not address the formal-informal interaction in which normative control mechanisms also affect individual attitudes and behaviors. Hence, some progress on a comprehensive theory of organizational control might be obtained by elaborating the causal mechanisms in OCC that reciprocally link administrative practices with the normative-level conditions in which they are situated. OCC are cohesive when control rationales and rationales in place are producing positive attitudes and behaviors among individual employees. Thus, cohesive OCC need to be aligned with specific organizational conditions and characteristics.

In their seminal work, Barley and Kunda (1992) observed that as firms grow complex and more knowledge intensive, they show less interest in administrative control rationales, particularly as they relate with traditional hierarchical-bureaucratic forms of control. Instead, they seek more embedded forms of control, namely social, clan, cultural and otherwise informal means of control, in a way that increases the importance of the normative rationale of control in knowledge work, particularly in KIOs. Whereas control in traditional organizations revolves around standard procedures and reliability-focused practices, control in KIOs is said to be based more on exploration and on learning-focused practices (Kärreman & Alvesson, 2004). Although the literature on OCC in KIOs generally acknowledges the existence of several models of control, the dominant view is that new forms of normative and “socio-ideological” control in the form of organizational culture and identity (Kunda, 1992; Pina e Cunha, 2002; Robertson & Swan, 2003), formal socialization through thoughts, emotions and beliefs (Kärreman & Alvesson, 2004) or the generalization of social norms, trust-based relationships and social embedding (Lazega, 2000;

Sewell, 2005; Styhre, 2008) largely outperform the traditional administrative logic, also so-called technocratic (Alvesson, 2004) or managerial logic of control (Styhre, 2008).

Notwithstanding the prevalence of normative control, some recent theory and empirical studies call into question some commonly held assumptions about the negative effects of traditional OCC in KIOs. The main argument is that informal control cannot replace all forms of formal, mechanistic mechanisms for the assessment and sanctioning of employees' contribution (Kärreman et al., 2002). This leads to questions about the specific control configurations in KIOs. In doing so, literature on control in KIOs might overlook certain knowledge settings where the prevalence of normative control may be smaller. In those settings, control configurations more closely resemble traditional, bureaucratic organizations (as in the case of certain professional service firms, health and academic organizations), or a mix between control practices from traditional firms and KIOs (such as in project organizations) (Wiener et al., 2016).

Figure 2 and Table 2 depict our proposed OCC on the four types of knowledge work and KIOs defined by Blackler's (2005) typology. The selection of activities and organizations that fall under each domain are general examples of what OCC might resemble in these settings. Rather than looking at the mechanics of control practices in isolation, these frameworks reorient our view toward the overarching OCC that different types of KIOs may establish for their employees. Hence, we offer a conceptual framework on OCC in KIOs upon which we will formulate propositions and highlight areas of future research.

Insert Figure 2 about here

Insert Table 2 about here

OCC in knowledge-routinized organizations

The great body of knowledge about control systems for traditional organizations where control systems—both their formal and informal rationales—are amenable to this type of knowledge organization. Knowledge-routinized organizations use formalization to respond to organizational phenomena in known ways. They draw on administrative and coercive sources of control and thus resemble control in more traditional, bureaucratic organizations. The central focus of this top-down control system is on administrative control, on the mechanisms available to management for framing individuals' work expectations and aligning them with the objectives of the organization (Tannenbaum, 1968).

In knowledge-routinized settings such as education, healthcare and law, the standardization of knowledge employees often comes via implementation of administrative and coercive appraisals in the form of management by objectives (crudely equating quality and value of output with number of courses taught and quantity of publications in higher education or patient visits and complaints in healthcare institutions) (Heckscher & Martin-Rios, 2013; Martin-Rios & Heckscher, 2014; Martin-Rios 2016b). There is an expectation that OCC in knowledge-routinized KIOs are significantly shaped by a top-down, command-and-control approach, and by contingent models of goal-directed behavior that usually view control systems as unilateral managerial configurations based on either measurement of outcomes (outcome control) or direct personal surveillance (behavior control) (Linder & Torp 2014; Olve, 2014). Most works pertaining to this type of setting have delineated OCC as considerably static sets of norms and mechanisms. This argument leads to our first proposition:

P1. OCC in knowledge-routinized KIOs closely resemble those of traditional, bureaucratic organizations.

OCC in expert-dependent organizations

Expert-dependent organizations draw on Dual Control Systems. As such, sources of control are expected to draw on a mix of individual or self-control and administrative rationales of control. A source of coercive control, self-regulation helps individuals monitor and control their own behavior, whereas social control forces individuals to be answerable in fulfilling duties and obligations (Frink and Klimoski, 2004). Accountability varies along the level of individual involvement in fulfilling duties and obligations. Thus, OCC for this type of KIO represent an organizational response to the need for providing individuals with a set of administrative, top-down norms and mechanisms that assess and sanction—reward, punish, and recognize—the accomplishment of duties and responsibilities as well as their participation in the work process and work outcome (Simons, 2005). Lazega (2000), for example, has analyzed the existence of informal lateral control regimes that work as a sanctioning mechanism among professional peers. In these particular knowledge settings, a mixed of formal and normative logics is a critical aspect of the OCC.

Professionally trained employees in expert-dependent knowledge organizations, such as professors, researchers, lawyers or doctors, draw on performance standards that derive not from within their organizations but from professional groups and accreditation boards with which they are involved. Their socialization and training has inculcated these standards in them and they should be judged by adherence to these standards.

Furthermore, in expert-dependent knowledge organizations, OCC needs to connect individual contribution measured by professional standards with the broader success of the organization. Objectives-based systems and clear operating rules may foster the individual's ability to act proactively toward to the organization at large, which results in strong emphasis on quantitative individual objectives. Centralized decision-making concentrates knowledge about the OCC, its norms and mechanisms, and its implementation and outcomes outside non-managerial organizational members. The above argument leads to the second proposition:

P2. OCC in expert-dependent KIOs include administrative and normative controls, with an emphasis on professional standards.

OCC in communication-intensive organizations

Communication-intensive organizations including high-reliability organizations, such as nuclear power plants, aircraft carriers, and firefighting crews establish Multidimensional Control Systems where control is expected to draw on lateral, peer mechanisms together with certain administrative and coercive sources of management control. A hierarchical system often means centralized decision-making (Drucker, 1954), a standard practice likely to collide in knowledge settings where so many organizational requirements concur at any given time (Adler, 2001). In communication-intensive knowledge settings, organization success rests on the employees' ability to engage in collaborative decision-making (Heckscher & Adler, 2006). The exclusion of employees from decision-making regarding control issues would have negative consequences for the legitimacy of the control system. Furthermore, an excessive focus on individual performance leads to difficulties in such collaborative environments, and is even more problematic when managed by the logic of control by objectives.

In communication-intensive KIOs work occurs within the sphere of teamwork, where short-term, pragmatic collaborations with peers are necessary to cope with complexity, variability, and ambiguity in work output. Given that collective (functional or departmental) objectives are the centerpiece of the OCC, individual employees have less input in the actual control process and individual merit is rarely given to individual accomplishments. However, hierarchical control systems focusing on formal relations may be limiting, preventing people from reaching beyond their formal relationships to establish crucial collaborative ties. Collaboration emerges as a way of attaining ill-defined, complex goals while stressing the need for working together across formal boundaries (Heckscher, 1995; Mohrman et al., 2003; Scott & Einstein, 2001). The emphasis in contribution and collaboration calls for a redefinition of the traditional roles of individuals in the workplace, their tasks and responsibilities (Heckscher & Adler, 2006).

Multi-lateral forms of control are exercised in these settings. These controls include multi-source or 360 degree evaluations where control stems from subordinates, peers, supervisors, other internal stakeholders and external customers. It is only through formalization of social relations that learning and knowledge sharing flourish (Nonaka & Takeuchi, 1995). Informal social control works when interpersonal relations among employees are rooted in informal—friendship and acquaintance ties; but this logic prevents people from developing formal collaborative relationships with peers. Peer evaluation is also remarkable in studies of non-KIOs. In those settings, peer control remains largely informal, though. For example, in their study of employees working in the operations, food and merchandise departments of a theme park, Loughry and Tosi (2008) conclude that peer surveillance exerts strong lateral control and provides organizations with certain positive outcomes (e.g. higher levels of commitment with organizational results).

By means of formal peer control, however, the trend is increasingly toward the formalization of traditionally informal work practices and relations (Heckscher, 2007; Morris et al, 2016). Recent research in project organizations highlights the importance of studying control portfolio configurations to better understand project control effectiveness (Wiener et al., 2016). This multidimensional OCC makes it possible to integrate heterogeneous control logics, shared responsibility and reflexivity. The above argument leads to the third proposition:

P3. OCC in communication-intensive KIOs are multidimensional, incorporating multisource evaluations and normative controls of shared responsibility and self-discipline.

OCC in symbolic-analyst-dependent organizations

Professional service firms are well-known examples of symbolic analyst-dependent knowledge organizations (Von Nordenflycht, 2010). Effective OCC in these organizational settings tend to emphasize normative sources of control, in the form of self-control and peer control. The bulk of research on this type of KIO focuses solely on some informal, normative dimensions of control (e.g. organizational and professional culture). Yet, other control mechanisms (e.g. individual reputation) are in place to address the prevailing forms of normative, social control.

Individual reputation plays a relevant role in these knowledge settings. People shape their behavior to burnish their reputation (Jones, Hesterly & Borgatti, 1997). An initial proposition connecting individual reputation and performance is presented by Kilduff and Krackhardt (1994: 88). They assert: "The higher an individual's reputation, the more valuable he or she becomes in the internal labor market." In administrative and coercive control logics, reputation operates informally through word-of-mouth and is disconnected from the control process; its connection to

an organization's goals is uncertain. In expert-dependent KIOs, reputation may be determined by the degree to which individuals are effective at meeting the expectations of each of their peers, subordinates and superiors. In this sense, the inclusion of reputation in the OCC of these KIOs represents a form of normative, social recognition of employee contribution.

Reputation captures the quality of exchange among peers in the form of collective accounts that grasp, allocate, and reward the behavior-exchange peers exhibit, such as the ability and frequency of interaction and the expertise-sharing behaviors exhibited, or timeliness in collaboration. This source of reputation capital reconciles others' perception about someone's ability to be knowledgeable, collaborative and reliable when required, which constitutes a core sanctioning element in knowledge settings. This is consistent with the extant literature in control, which highlights the increasing emphasis on identity (De Jong et al., 2014; Kärreman & Alvesson 2004) or what Styhre (2008) defines as “unobtrusive forms of control”.

One of the greatest difficulties in the establishment of a OCC in symbolic-analyst-dependent organizations is finding and securing balance among administrative and normative practices. Although essential for firms (March 1988), balance is dynamic and not only changes over time, but can also take different forms depending on the specifics of the situation. Cardinal et al. (2004) define balance as “a state where an organization exhibits a harmonious use of multiple forms of control” (p. 412). To date, empirical attention to balanced OCC in KIOs has focused primarily on the effects that different forms of control have on professionalism and professional authority common to service knowledge organizations and the increased professional authority in non-professional organizations (e.g., researchers at industrial firms or faculty at universities or government) (see, for example, Adler et al. 2008; Hanlon 2004; Lazega 2000). This emerging line

of inquiry has started to identify the variety of control mechanisms used by professional organizations to maintain an appropriate balance.

Given the reliance on collaborative arrangements that exists in symbolic-analyst KIOs, OCC entails active involvement of all participants in the work process (supervisors, peers, subordinates and customers). Supervisors alone might not hold all the necessary information to assess and sanction individual contribution. Hence, these knowledge settings provided conditions amenable to shared, collaborative (normative) control approaches but detrimental to hierarchical (administrative) forms. The above argument leads to the fourth proposition:

P4. OCC in symbolic-analyst KIOs draws on normative controls, by means of reflexivity, self-control and shared, collaborative control rationales.

THE AGENDA FOR FUTURE RESEARCH

The purpose of this article has been to contribute to research on OCC in KIOs. The article illustrates the complexity and dynamics of control in KIOs, which is of special interest to public affairs (McGrath et al., 2010; Weaver et al., 1999), public management (Martin-Rios 2016a; Tan 2014) and management theory at large (Birkinshaw, 2010). It is hoped that this paper will prove useful to further empirical research in the field of public affairs by suggesting a theoretical framework for OCC.

Based on interdisciplinary analysis of the extant literature on OCC, the paper offers a comprehensive look at the "control pathway" taken by the various KIOs, as defined in Blackler's (1995) typology of knowledge organizations. We have proposed that by viewing OCC through the lens of control modes or rationales, we can better understand how to advance OCC in knowledge-

intensive settings. With few exceptions, existing literature tends to focus attention on specific control mechanisms such as administrative controls in professional organizations (Rennstam & Kärreman, 2014), coercive control in R&D settings (McCarthy & Gordon, 2011), or normative control practices in collaborative creative settings (Adler & Chen, 2011). Few studies have examined the existence of OCC in the context of KIOs and how the various control practices from various rationales coexist, interact, and influence one another (Cardinal et al. 2004; Martin-Rios, 2015; Styhre 2008). The various interpretations of the suitability of different OCC in KIOs point to the lack of theoretical consensus on how OCC fit organizational constraints so as to maintain a balance between the different rationales and logics of control that matches the complex organizational requirements of KIOs (Blackler, 1995; Cardinal et al., 2004).

This article suggests that organizations in complex, knowledge-intensive environments should seek to set up OCC based on a variety of control logics or rationales. This would help to raise awareness and mobilize efforts beyond the boundaries of long-established unidirectional OCC. By means of this review, we aim to fill a gap in the organizational literature of control in KIOs offering an integrative review of existing theory and research and highlighting gaps in the field of organizational control. The argument of this paper is to move beyond existing perspectives on the study of control systems in KIOs by examining the significance of complex, multi-dimensional forms of governance associated with the different organizational configurations. Since KIOs are faced with the challenge of employing management strategies that are different from those of traditional organizations, we assume that some control concepts that were useful in the past now need to be contextualized and expanded. Moreover, the lack of a conceptual framework has precluded the development of an understanding of many important phenomena not adequately explained by extant research. The levels of control— top-down, lateral or self-

regulating—provide a framework for understanding how OCC are theorized and analyzed in each of Blackler’s knowledge types of KIOs.

The proposed approach to control has a number of implications. First, it highlights the importance of broadening the scope of OCC. Prior research has found that a multi-level perspective on control rationales is crucial for organizational control in KIOs (Simons, 2005). However, organizational control focused on several levels of control is a concept that organizations are only just beginning to come to grips with. Frequently, the difficulty in establishing new OCC and the absence of immediate and pervasive outcomes may persuade organizations to either retain practices originally designed for non-KIO settings or to adjust their OCC by making only minor modifications to existing norms and practices. We suggest that KIOs increase the perceived overall effectiveness of the OCC when control is rooted in the distinctive attributes of each type of knowledge organization and, at the same time, it captures the complex and multidimensional nature of coexisting control logics.

As a concluding remark, we observe two further areas of research to move our analysis forward. First, we reviewed studies on various OCC that use administrative, coercive and normative practices. Further research might consider exploring these different practices, classifying and analyzing implementing micro-practices and highlighting whether and how different forms of knowledge work shape different OCC. Further research on OCC in KIOs could focus on diverse control rationales put in place by organizations to determine the issues for which people are held accountable. More work is needed to uncover the way in which KIOs establish administrative practices built around or in parallel to other sources of normative control for different groups of employees (e.g. do public affairs departments have the same control rationales as other corporate departments? Or are there variations across administrative, coercive and

normative controls?). Second, the examination of alternative theoretical views of OCC will likely draw attention to different conceptions of social control. Also, such approaches may lead to novel understandings of organization-individual relations in knowledge environments and new theories of organizational behavior. Findings from this change of perspective might provide insights and explanations on OCC's agency, resistance and contingencies that this study cannot anticipate.

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FIGURES

Emphasis on collective endeavor	<p><i>(ii) Knowledge-routinized organizations</i></p> <p>Emphasis on knowledge embedded in technologies, rules and control</p> <p>Typically capital, technology, or labor intensive. Hierarchical division of labor and control.</p>	<p><i>(iv) Communication intensive organizations</i></p> <p>Emphasis on encultured knowledge and collective understanding</p> <p>Communication and collaboration the key processes. Empowerment through integration. Expertise is pervasive.</p>
	<p><i>(i) Expert-dependent organizations</i></p> <p>Emphasis on the embodied competencies of key members</p> <p>Performance of specialist experts is crucial. Status and power from professional reputation. Heavy emphasis on training and qualifications.</p>	<p><i>(iii) Symbolic-analyst-dependent organizations</i></p> <p>Emphasis on the emtrained skills of key members</p> <p>Entrepreneurial problem solving. Status and power from creative achievements. Symbolic manipulation is a key skill.</p>
	Focus on familiar problems	Focus on novel problems

Figure 1. Typology of knowledge work and knowledge-intensive organizations (Blackler, 1995)

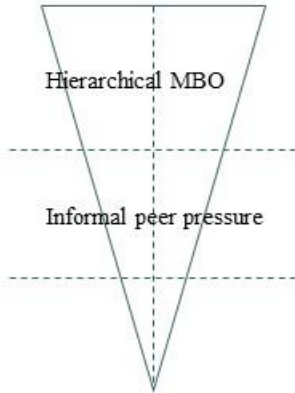
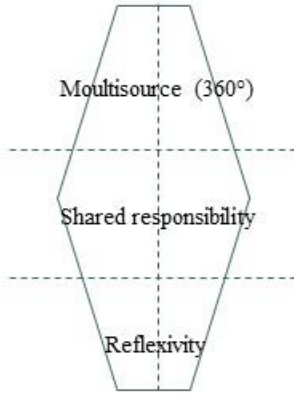
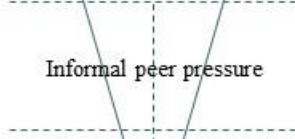

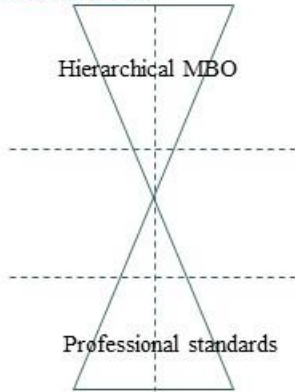
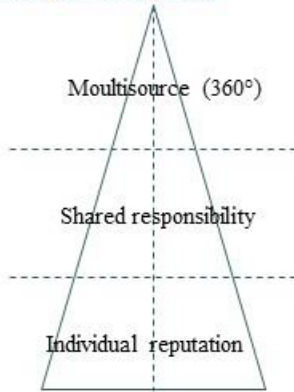
EMPHASIS ON COLLECTIVE ENDEAVOR	SOURCE OF CONTROL	(ii) Knowledge-routinized KIFs <i>(Top-down control system)</i>	(iv) Communication intensive KIFs <i>(Multidimensional control system)</i>
	Management		
	Lateral, Peer		
EMPHASIS ON CONTRIBUTIONS OF KEY INDIVIDUALS	Self, individual		
		(i) Expert dependent KIFs <i>(Dual control system)</i>	(iii) KIFs focused on novel <i>(Bottom up control system)</i>
		Management	Management
		Lateral, Peer	Lateral, Peer
		Self, individual	Self, individual
		FOCUS ON FAMILIAR PROBLEMS	FOCUS ON NOVEL PROBLEMS

Figure 2. Control configurations for different types of KIOs

Table 1. Managing control in traditional organizations and KIOs: Sample insight from the literature

Organizational paradigm	Rationales of Control		
	Administrative	Coercive	Normative / Social
Traditional organization	<p>Cybernetic, feedback loop to the attainment of goals (Hofstede, 1978)</p> <p>Managerial control of behaviors and output (Eisenhardt 1985; Ouchi 1979)</p> <p>Regulating technology and information (Luhmann 1993; Mintzberg 1979)</p> <p>Human resource management (Snell 1982)</p>	<p>Teamwork (Ezzamel & Willmott 1998)</p> <p>Control of people's emotional life and emotions (Gabriel 1999; Sutton 1991)</p> <p>Workplace surveillance (Orlikowski, 1991)</p> <p>Managerial practices to perpetuate power (Barlow 1989)</p>	<p>Concertive control by teams and team processes (Barker 1993)</p> <p>Cultural, ideological or “loose-tight” control (Kunda 1992)</p> <p>Informal socialization (Govindarajan & Fisher 1990)</p> <p>Affective control (Klein 1989)</p>
Knowledge intensive firm (KIFs)	<p>Market mechanisms and microfoundations (Foss 2007)</p> <p>Management techniques to direct employee behaviors (Abernethy et al., 2010; Martin-Rios & Erhardt, 2008; Turner & Makhija 2006)</p> <p>Accountability system (Martin-Rios 2015; 2016)</p> <p>Administrative control systems (Ditillo, 2012; Linder & Torp 2014; Maravelias 2009; McCarthy & Gordon 2011; Olve 2014)</p>	<p>Project-based working (Hodgson, 2004; Rennstam & Kärreman, 2014)</p> <p>Electronic surveillance (Rennstam, 2012; Sewell 1998)</p> <p>Totalizing control (Schwartz, 1987)</p>	<p>Socio-ideological, peer control (De Jong et al., 2014)</p> <p>Cultural control of thoughts, emotions and beliefs (Adler & Chen 2011; Kärreman & Alvesson 2004; Robertson & Swan 2003)</p> <p>Network, collaborative community and lateral control (Adler et al. 2008; Lazega 2000)</p> <p>Imaginary register (register of images) (Styhre 2008)</p>

Table 2 Organizational type and sources of control rationales

Organizational type (Blackler, 1995)	Formal control	Normative control	Control challenges
Knowledge-routinized organizations	- Individual management by objectives (MBO)	Informal peer pressure	- Rigid, formal performance-(output) driven metrics - Less reliance on individual expertise
Expert dependent organizations	- Administrative control (e.g. MBO)	Professional standards	- Tension between formal and normative control - Distrust the control system
Communication intensive organizations	- Multisource and objectives (MBO)	Shared responsibility Self-discipline	- Balance between normative and performance-driven metrics
Focused on novel problems	- Multisource (e.g. 360-degrees) - Normative control engrained in formal control	- Shared responsibility - Individual reputation	- Balance between administrative and normative control - Reliance on subjective judgments