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Logics of Accountability: Cross-national Patterns in School-Level Controls

Taeyeon Kim
&
John T. Yun
Michigan State University
United States

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Abstract: This paper explores multiple logics of accountability by examining patterns of control of various school functions under different accountability systems. Research has shown that accountability is a global phenomenon, but how accountability is understood and enacted is locally contextualized, which implies the existence of multiple logics of accountability in practice. By linking theoretical arguments rooted in literature to empirical evidence observed in TALIS 2013, we aim to theorize logics of accountability and then demonstrate the existence of those logics across countries. We first developed a framework of logics of accountability: control-based, professional-based, test-based, and process-based accountability. We then empirically analyzed three types of control—external, internal, and mixed control—at the school level across countries and within four content areas—assessment, human resource, curriculum, and budget—to infer how each country consistently follows a logic of accountability in their schooling practices. We found that a few countries followed a relatively pure form of control-based, professional-based, and process-based logic; however, most countries followed mixed-forms of logic. Our findings provide a systematic approach for the mapping of accountability logics across countries and suggest that more

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thought should be paid to how the underlying logic of accountability should manifest across these different functions.
Keywords: Educational accountability; logics of accountability; educational control; TALIS 2013; cross national analysis

Lógica de la rendición de cuentas (*accountability*): Patrones transnacionales en los controles a nivel escolar

Resumen: Este documento explora múltiples lógicas de rendición de cuentas mediante el examen de patrones de control de diversas funciones escolares bajo diferentes sistemas de rendición de cuentas. La investigación ha demostrado que la rendición de cuentas es un fenómeno global, pero la forma en que la rendición de cuentas se entiende y se implementa se contextualiza localmente, lo que implica la existencia de múltiples lógicas de rendición de cuentas en la práctica. Al vincular los argumentos teóricos enraizados en la literatura con la evidencia empírica observada en TALIS 2013, nuestro objetivo es teorizar las lógicas de responsabilidad y luego demostrar la existencia de esas lógicas en todos los países. Primero desarrollamos un marco de lógica de rendición de cuentas: rendición de cuentas basada en control, profesional, basada en pruebas y en procesos. Luego analizamos empíricamente tres tipos de control: control externo, interno y mixto, a nivel escolar en todos los países y dentro de cuatro áreas de contenido: evaluación, recursos humanos, plan de estudios y presupuesto, para inferir cómo cada país sigue consistentemente una lógica de rendición de cuentas en sus prácticas escolares. Descubrimos que algunos países seguían una forma relativamente pura de lógica; sin embargo, la mayoría de los países siguieron formas lógicas mixtas. Nuestros resultados proporcionan un enfoque sistemático para el mapeo de las lógicas de rendición de cuentas en todos los países y sugieren que se debe pensar más en cómo la lógica subyacente de la rendición de cuentas debe manifestarse a través de estas diferentes funciones.
Palabras-clave: de rendición de cuentas educativa; lógicas de rendición de cuentas; control educativo; TALIS 2013; análisis transnacional

Lógica de prestação de contas (*accountability*): Padrões transnacionais em controles no nível escolar

Resumo: Este documento explora várias lógicas de prestação de contas examinando os padrões de controle de várias funções da escola em diferentes sistemas de prestação de contas. A pesquisa mostrou que a prestação de contas é um fenômeno global, mas a maneira pela qual a prestação de contas é entendida e implementada é contextualizada localmente, o que implica a existência de várias lógicas de prestação de contas na prática. Ao vincular os argumentos teóricos enraizados na literatura às evidências empíricas observadas no TALIS 2013, nosso objetivo é teorizar a lógica de prestação de contas e, em seguida, demonstrar a existência dessas lógicas em todos os países. Primeiro, desenvolvemos uma estrutura de lógica de prestação de contas: baseada em controle, profissional, baseada em evidências e baseada em processos. Em seguida, analisamos empiricamente três tipos de controle: controle externo, interno e misto, no nível escolar em todos os países e em quatro áreas de conteúdo: avaliação, recursos humanos, currículo e orçamento, para inferir como cada país segue consistentemente uma lógica prestação de contas em suas práticas escolares. Descobrimos que alguns países seguiam uma forma relativamente pura de lógica; no entanto, a maioria dos países seguiu formas lógicas mistas. Nossos resultados fornecem uma abordagem sistemática ao mapeamento das lógicas de prestação de contas em todos os países e sugerem que se deva pensar mais sobre como a lógica subjacente da prestação de contas deve se manifestar por meio dessas diferentes funções.

Palavras-chave: prestação de contas educacional; Lógica de prestação de contas; controle educacional; TALIS 2013; análise cruzada nacional

Introduction

Research has shown that accountability is a global phenomenon in education policy and permeates individual societies despite its conceptual ambiguity and complexity (Dubnick, 2014; Holloway, Sørensen, & Verger, 2017; Thiel & Bellmann, 2017). In school settings, a broad framing of accountability has been often understood as the process or mechanism that assure schools meet their intended goals (Rothman, 1995). Increasing accountability discourses in education policies has given rise to rigorous standards of evaluation for school management processes, utilizing standardized assessments for student achievement, and instituting incentives and sanctions for teachers, schools, and districts (Holloway, Sørensen, & Verger, 2017; Ingersoll & Collins, 2017). In the United States, the No Child Left Behind Act (2002) and its revised version, Every Student Succeeds Act (2015), are representative examples of accountability policies, a phenomenon that has spread internationally (Brewer, Knoeppel, & Lindle, 2015; Holloway et al., 2017; Lee & Amo, 2017; Rizvi & Lingard, 2009; Sahlberg, 2010). The emergence of globalization of education policy has influenced establishing accountability policy agendas at the local level through transnational policy networks. For example, international organizations such as OECD and World Bank have been actively involved in transnational policy making in education by producing and disseminating a set of terminologies and discourses (Meyer, Tröhler, Labaree, & Hutt, 2014; Niesche & Thomson, 2017). Through international reports using international indicators, utilization of international testing such as PISA, and internationally organized educational conferences or summit events, transnational policy-making bodies have facilitated spreading accountability policy discourses globally and influenced policy development within nation-states (Meyer et al., 2014; Niesche & Thomson, 2017; Torrance 2006; Steiner-Khamsi, 2003). Several countries including the US, Germany, Norway, and Ireland revised their national education policies to reflect competencies often measured in the PISA framework (Labaree, 2014) Commenting on such phenomenon, Meyer et al. (2014) stated that "accountability" on this global scale appears to be "the master rationale for education reform" (p. 2).

In this paper, we focus on variations in educational accountability phenomenon, particularly the multiple logics of accountability that may exist beyond "official" state-based approaches. Responding to accountability discourses, researchers have reported theoretical debates around different forms of accountability, such as what forms of accountability ought to be considered over test-based accountability which has been dominant in education (e.g., Cranston, 2013; Fullan, Rincón-Gallardo, & Hargreaves, 2015; Sahlberg, 2007; Turnipseed & Darling-Hammond, 2015). In addition, researchers have empirically shown that there are multiple ways to achieve accountability across education systems internationally (e.g., Dorn & Ydesen, 2015; Klein, 2017; La Londe, 2017; Lim, 2016; Maroy, Pons, & Dupuy, 2017; Rasmussen & Zou, 2014; Thiel & Bellmann, 2017). Findings from these studies indicate that accountability policy implementation remains multifaceted depending on the context (Holloway et al., 2017; Klein, 2017), and therefore, the logics behind the implementation of accountability can differ based on historical backgrounds and structures of the education system. For example, some countries historically generated centralized decision-making processes in their overall education systems, while others valued decentralized decision-making processes within schools—using either test-based incentives to shape local decisions or clear professional/curricular standards to move education towards very specific national/regional goals.

Building on this idea, we aim to theorize possible logics of accountability by linking theoretical arguments about forms of accountability to empirical cross-national data in order to understand the current logics of accountability in different education systems. To identify multiple

logics of accountability, we develop a framework for logics of accountability and analyze these logics empirically using the international data set. We chose to conduct a cross-national analysis to examine patterns at the country level because cross national analysis can help us to map multiple logics that may not be observable within any one educational system. We acknowledge variations across regional contexts in accountability systems within countries (e.g., Stosich, Snyder, & Wilczak, 2018; Thiel & Bellmann, 2017). However, in this paper, we focus on country-level variations, asking whether or not certain countries show agreement on a certain logic of accountability—thus also identifying countries that show very little internal agreement about their own accountability logic. By using survey data from 38 countries that participated in the Teaching and Learning International Survey (TALIS) 2013, we generate further discussion using actual practices about what extent individual countries show shared-practices in their logics of accountability.

To reveal various enacted logics of accountability, we analyze patterns of control for various school functions under different accountability systems by calculating country average self-reports of school-level external control. For example, if all schools in a country report that there is external control of curriculum then that country would have a very consistent external control to curriculum. According to Bray (2013), accountability policy implementation can entail different types of control which vary across different administrative levels (e.g., national, regional, local, school level), areas (e.g., curricula, human resource, finance), and degrees (strong or weak). We expected that how countries distribute these controls would reveal the multiple logics of accountability existing across countries. We use school leaders' perception of external control over key school functions (assessment, human resources, curriculum, and budget) within their schools as surveyed by the 2013 collection of the TALIS dataset. The school governance literature has focused on these three elements of schooling (curriculum, human resources, and budget) as central to school-level decision making (Bray, 2013; Manna & McGuinn, 2013). In addition, the accountability literature has regarded use of testing as an instrument for changing practices (e.g., Meyer et al., 2014). Therefore, we argue that the degree to which schools have control over these aspects of schooling largely determines the degree to which school have control over their own key functions. We further suggest that, while explicit statements of accountability systems are important to consider (e.g., national or state policy reports), the descriptions of responsibilities for various school functions should provide a window into the underlying logic of those accountability systems across countries, and how they are understood and implemented locally, in this case, at the school level. Thus, our findings offer a systemic approach for the mapping of accountability logics across countries that will help identify complexity and ambiguity of accountability and its practice globally.

Based on our analytic approaches, we answer the following research questions:

1. Can we determine empirically, within key domains of schooling (including assessment, human resource, curriculum, and budget), whether control for these domains left to the school or to entities outside the school across countries? From this information, can we empirically construct logics of accountability that are consistent with the literature?
2. To what extent are our empirically identified logics of accountability consistent across individual countries?

To answer these questions, we provide background literature that guides our logics of accountability framework. Applying this framework, we empirically analyze logics using data from the TALIS 2013 in the finding section.

Developing a Logics of Accountability Framework

This section examines how logics of accountability have been historically framed and how they work internationally. We examine the intersection between school decentralization reform and education accountability to develop a framework for logics of accountability. Exploring debates around decentralization reform shows how the logics of accountability systems historically and internationally can be framed within the decentralization movement (Bray, 2013; Edwards & DeMatthews, 2014). Decentralization reforms have influenced shaping national and local education systems around the world in the post-World War II era, but from 1990s, recent efforts of decentralization were replaced by accountability policies in education reform discourses internationally (Edwards & DeMatthews, 2014).

School Decentralization Reform

Who controls education and schools has been a key issue in enacting education policies (Bray, 2013; Cooper, Fusarelli, & Randall, 2004). Determining involvement and access to content is political and technical because it influences power dynamics between different groups and shapes education systems (Bray, 2013). Research has highlighted debates around decentralization in relation to a wide range of school reforms in the global context. While motives for decentralization reforms differ according to national and local contexts of education, research findings around the world show that (1) political and administrative motivations are critical and (2) the level of decentralization ranges from national/state, to local/regional, to individual school-level authority (e.g., Bray, 2013; DeBoer, 2012; Dorn & Ydesen, 2015; Edwards & DeMatthews, 2014; Manna & McGuinn, 2013).

According to Edwards and DeMatthews' (2014) review of worldwide decentralization trends, logics behind decentralization education reforms changed from a means to reflect local community needs to a means for fixing failing schools. In 1960s and 1970s, most nations sought to establish public education systems as an important goal for national prosperity; governments tried to improve public school operations as a means of national progress (Bray, 2013; Manna & McGuinn, 2013). In the US, major cities adopted local community control in public school systems on the basis of assumption that community-driven decentralization reflects local contexts and the needs of traditionally marginalized groups in schooling, and thus, increases equity in school resource allocations and operational inefficiency (Cronin, 1973; Reed, 1992). Similarly, many developing countries lacking of educational resources emphasized increasing access to education through administrative decentralization (e.g., bureaucratic school systems) in this period (Bray, 2013).

In 1980s and 1990s, researchers highlighted school decentralization as a means to fix failing schools and improve efficiency and effectiveness. Theoretically, the rise of neoliberalism in public services facilitated decentralization in this period by framing governmental failure in public education systems (Ball, 2017; Meyer & Boyd, 2001). Since the idea of neoliberalism endorsed privatization of public services and localization of education by devolving government controls (Morrow & Torres, 2000; Saltman, 2018), it often related structural adjustment policies (Astiz, Wiseman, & Baker, 2002). Therefore, decentralization of governance over public sectors including education was one of the popular reform discourses (McGinn & Street, 1986). A vast amount of the school reform literature examined the effect of decentralized school governance to achieve educational outcomes using evidence from the Chicago school reform plan. This far reaching Chicago reform was one of the well-known decentralization efforts implemented in the US during this period, which radically devolved the centralized authority to over 500 individual schools (Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010; Reed, 1992). Decentralization movements centered at the school level and creation of school councils (including community members, teachers, and principals) was essential in the application of school reform (Malen, Ogawa, & Kranz, 1990).

The school reform literature highlighted school restructuring toward decentralization under three key domains: human resource, school curriculum, and finance (Manna & McGuinn, 2013). School-based management is one of the world-wide exemplary decentralization reforms, which demands less control and uniformity in school operation, lauding professionalism at the school level (Caldwell, 2005). Advocates of school-based management argued that school communities including teachers, administrators, and parents need to make decisions regarding tailoring local curricula, hiring staff members, and allocating budget at the school level based on the needs of the specific school contexts (Bray, 2013; Hannaway & Carnoy, 1993). This was not an isolated incidence and many countries initiated school-based management reforms as a part of decentralization movements. For example, in New Zealand, school-level board of trustees were created, which composed of members who were contracted with their communities (Arnove, Torres, & Franz, 2012). The board had authority to make decisions on hiring teachers and managing school budgets. In Spain, a reform initiative led School Councils to select the school principals. Multiple reform initiatives also transferred control of curriculum decisions to school level (Luengo, Sevilla, & Torres, 2005). For example, multiple districts in the US had teacher committees play an important role in choosing textbooks and developing curriculum (David, 1989). Korea, where the curriculum had been traditionally centralized at the national level, has adopted local-and school-level curriculum since early 1990s to better meet the demands of the local school communities (So & Kang, 2014). Given the context of school-based management reforms, school was considered a unit of "management" and school principals were responsible for the final decisions made at the school level. Using plentiful evidence of school-level decentralization reforms, international organizations, such as World Bank, have supported the idea of decentralization reform and extended decentralization reforms globally (Edwards & DeMatthews, 2014).

In the late 1990s, decentralization efforts started intersecting with accountability discourses. Edwards and DeMatthews (2014) found more recent decentralization reforms were replaced by accountability policies that followed the rationale of market principles which suggest that local decentralization would be better utilized in conjunction with strong external controls creating appropriate incentives for action—in other words, by setting external goals and providing local entities with the autonomy to achieve those goals, better outcomes could be achieved. Implementing standardized testing policies, employing performance-based incentives and punishments, and increasing market competitions became popular (Foster, 2004; Lee & Amo, 2017; McDermott, 2011). Market forms of accountability policies that feature test-based performance as the key metric have replaced decentralization movements as the dominant discourse in current global education environments (Edwards & DeMatthews, 2014). The shift relied on the logic that outcome-based accountability is needed to ensure educational quality because decentralization allowed school-level autonomy in multiple school processes. Under this accountability-based heuristic, schools need to provide outcomes (student achievement) which satisfy tax-payers and the governments as a trade-off for greater local autonomy.

While many countries have adopted decentralization and accountability agendas in their education reforms, research has also revealed that cultural and historical backgrounds of the country influence the logics behind the reform implementation. For example, in some countries (e.g., China, France, The United Arab Emirates), the central governments strongly drive reforms by controlling educational processes and outcomes (Green, 2013; Han & Ye, 2017; Litz & Scott, 2017), but in other countries, (e.g., Netherlands, United Kingdom), educators and administrators can have more power in decision making of school functions (Kuiper, Nieveen, & Berkvens, 2013; Webb et al., 2004). These findings indicate that country-level patterns may exist and shape practice regardless of the countries espoused logic of accountability.

Accountability: Multiple Dimensions

In recent decades, accountability policies have driven school systems to ensure schools improve their outcomes (Bae, 2018; Lee & Amo, 2017; McDermott, 2011). Accountability, originally adopted from the corporate world, often relies on a relationship between a service provider and an agent with the power to evaluate the provider (Newmann, 1997). Researchers have pointed out that the term "accountability" remains ambiguous and multifaceted as the concept mobilizes internationally; thus, accountability has been framed differently depending on local contexts (Dubnick, 2014; Holloway et al., 2017). Despite of this complexity, within the public schooling context, accountability can be often understood as "the process by which school districts and states (or other constituents) attempt to ensure that schools and school systems meet their goals" (Rothman, 1995, p. 189). Reflecting on educational context, researchers have explored multiple forms of accountability (e.g., Cranston, 2013; Elmore, 2004; Firestone & Shipps, 2005; Fullan, Rincón-Gallardo, & Hargreaves, 2015; Gonzalez & Firestone, 2013; Normore, 2004). To frame the literature on accountability, we use two analytical dimensions: (1) process versus outcome accountability (Patil, Vieider, & Tetlock, 2014) and (2) external versus internal accountability (Newmann, 1997).

Process versus outcome accountability. Patil et al. (2014) suggested two different approaches to hold others accountable—efforts to achieve outcomes (process accountability) and effectiveness in carrying outcomes (pure outcome accountability). Most accountability systems adopt process-outcome hybrid approaches; however, depending on context and task, the system may weigh either process or outcome more in evaluating performance (Patil et al., 2014). Process accountability assumes that having incentives on best practices (processes) is effective because employees cannot control all outcomes, but they can control practices. Proponents of process accountability believe that additional control over outcomes is inefficient and divests employees of agency in commitment to their work (Patil et al., 2014). By contrast, proponents of outcome accountability criticize the process accountability approach because it can be used to justify bureaucratic rituals that employees may use to excuse poor outcomes (Tetlock & Mellers, 2011).

In education, process accountability focuses on *how* schools function in their best efforts to support student learning. An example of this could be restructuring school governances as part of decentralization reforms. Outcome accountability focuses on *what* schools (teachers and leaders) actually accomplish, which has most recently manifested as outcomes on standardized assessments of student learning. In analyzing the policies that applied outcome accountability, research has highlighted the problem of trustworthiness in the ways teachers and school leaders report outcomes (e.g., Darling-Hammond, 2007; Ravitch, 2016). For instance, schools and teachers found ways to adjust student test scores, which negatively affect student learning by diminishing the equity and quality of instructional practices (e.g., Darling-Hammond, 2007). Criticizing the pure form of outcome accountability, some researchers have asserted that high performing education systems have high levels of process-focused support for teaching quality and school resources (Fullan et al., 2015; Mourshed, Chijioke, & Barber, 2010; Sahlberg, 2010).

External versus internal accountability. External accountability has generally been defined as the control by an external authority to achieve school goals (Fullan et al., 2015; Newmann, 1997). In contrast, internal accountability can be understood as building the individual and collective capacity from inside the organization to meet the educational challenges identified by local educational professionals (Cranston, 2013; Firestone & Shipps, 2005; Gonzalez & Firestone, 2013; Hargreaves & Shirley, 2009; Newmann, 1997). Some researchers have more precisely specified these typologies. For example, Firestone & Shipps (2005) developed five types of accountability:

political, bureaucratic, market, professional, and moral accountability. They viewed political, bureaucratic, and market accountability as external accountability and professional and moral accountability as internal accountability, and implied that these multiple forms of accountability are not mutually exclusive in systems, and thus, can find themselves in competition with one another.

Internal accountability approaches may rely on the professional ethics and standards of a field (professional accountability) and the principles (moral accountability) that educators hold in their work-related actions (Firestone & Shipps, 2005; Gonzalez & Firestone, 2012; Normore, 2004). In this sense, Fullan et al. (2015) regarded accountability as simply "taking responsibility for one's action" (p. 4). Also, Cranston (2013) suggested the using the language of "professional responsibility" (p. 135) which includes moral aspects and professional values for describing internal accountability instead of using the language of "accountability". In contrast, external accountability may operate through election systems that expect elected officials will carry out their proposals (political accountability), administrative processes within the hierarchy of the education system (bureaucratic accountability), or competitions from the market forces to satisfy clients (market accountability). These varying definitions describe the wide range of approaches that can be applied to reform efforts and how accountability can drive those efforts.

Logics of Accountability in Education

Using the two aforementioned dimensions (outcome-process and external-internal) of accountability, we posit the existence of four logics of accountability and reviewed the literature that support these logics. These logics emerge from crossing the two dimensions and creating a 2×2 matrix of accountability logics as shown in Figure 1. From this further categorization, we can create a typology that defines different logics of accountability as control over outcomes or processes and divide the different options in a 2×2 matrix of possibilities with level of external control over outcomes and processes as the rows and columns of the matrix.

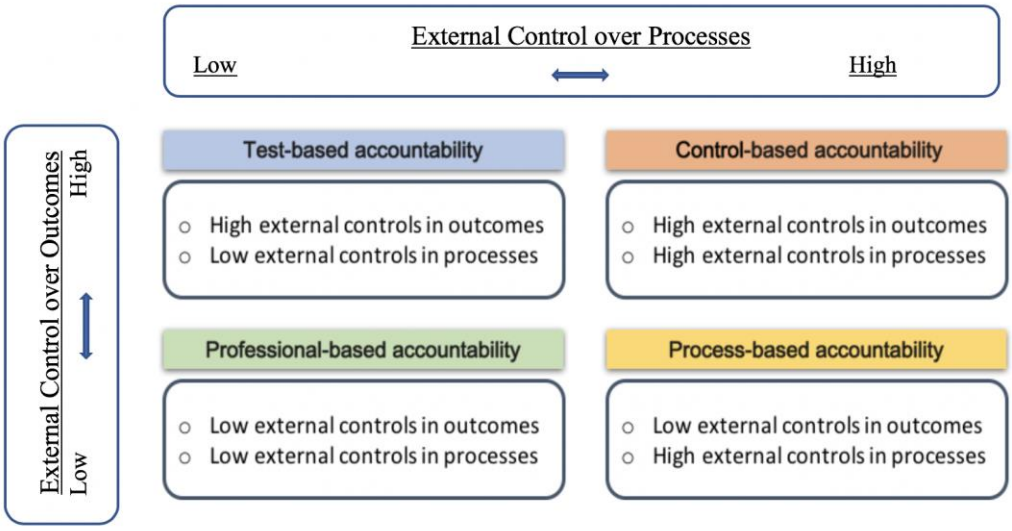

Figure 1. Logics of Accountability

Control-based accountability. When a system has high external controls on both processes and outcomes, we introduce the logic of *control-based accountability* (the upper right side box

in Figure 1). Debates around centralization and decentralization in education reforms imply that some countries have historically adopted control-based logic to achieve accountability. This logic relies on external control over all types of school production—particularly over the four domains of student testing, human resources, school curriculum, and finance (Bray, 2013; Green 1999; Han & Ye, 2017; Litz & Scott, 2017). Within this logic, by exerting external control over these key aspects of schooling, the country's goals for education are more likely to be met. Before decentralization reforms became popular, some countries advocated centralization of education systems for efficiency or nation building (Bray, 2013). For instance, in England, a centralizing national curriculum was announced by the government in 1988 (Adnett & Davies, 2003). Some countries with intranational diversity in cultures of learning utilize centralizing curriculum, instruction, and testing as a means for building unified norms of knowledge in the nation (Bray, 2013).

Professional-based accountability. In opposition to control-based logic, we posit a *professional-based accountability* where a system focuses on processes of schooling and excludes external control over either processes or outcomes (the lower left box in Figure 1). Literature on decentralization and internal accountability suggests some education systems use professional-based logic in approaching accountability, which assumes that school-based internal control is effective in achieving desirable school outcomes (Darling-Hammond et al, 2014; Elmore, 2004; Fullan et al., 2015; Newman, 1997; Platt et al, 2008; Sahlberg, 2010). Newmann (1997) argued that school accountability may be more reliably achieved through internal mechanisms because strong external accountability can undermine school organizational capacity by limiting organizational decisions that may best match students' needs and schools' personnel. Aligning with this, research on school capacity development (e.g., teacher and principal professional development) proposes a mechanism consistent with these facets of schooling inside schools under accountability policies (Darling-Hammond et al., 2014; Elmore, 2004; Platt et al., 2008; Sahlberg, 2007). This suggests that schools can achieve their goals by managing their own organizational components and relying on the professionalism of educators to make choices consistent with better practices that fit with the local conditions in their schools (Darling-Hammond et al., 2014; Newmann, 1997).

In the global context, some countries historically value this logic in school systems. For example, Møller and Schratz (2008) showed that Scandinavian countries have a strong tradition of viewing schooling through a lens of democratic ideal. Klein (2017) noted that Finland has a decentralized governance system where municipalities have the most responsibility in schooling decisions. Finnish teachers have high levels of autonomy in developing the curriculum at the local level within the criteria of the national curricula, and the final exit exam in upper secondary level is the only standardized assessment that all students take (Hendrickson, 2015; Sahlberg, 2010).

Test-based accountability. Recent accountability policies suggest the category of *test-based accountability*, which externally controls school outcomes through test policies but gives autonomy to school processes of how to achieve test scores (Bae, 2018; Lee & Amo, 2017; McDermott, 2011; Normore, 2004). On our process-outcomes/internal-external axes, this would occupy the process-internal/outcomes-external quadrant (the upper left side box in Figure 1). Theoretically, this logic draws on rational behaviorism, which assumes that schools and teachers are accountable for test results; having sanctions or incentives will tighten the relations between teachers' practices and student performance (Lee & Amo, 2017). Test-based logic can be supported by market principles, which prioritize competition, choice, and efficiency (McDermott, 2011). Under market principals, schools have extensive autonomy in multiple areas so that schools compete for students and resources (Klein, 2017). For example, in the US, test-driven external accountability policies were adopted across states under the NCLB Act and the federal Race to the Top (RTTT) program. The NCLB Act instituted clear external monitoring of test-based outcomes and mandated state control

of assessments, but did not offer a unified curriculum, process for hiring, or budgetary process leaving those up to the states, but not necessarily the schools—a point that we will discuss later. As multiple states demanded tests for graduation requirements, there were efforts to evaluate teachers based on students' test results, an approach that is still highly controversial (Lee & Amo, 2017).

Research also suggests that the English education system relies on test-based logic by applying a high-stake accountability that utilizes tests at different stages and inspections to increase market competition (Adnett & Davies, 2003; Glatter, 2012). During the last decades, reducing the influences of local education authorities, policies have allowed either the central government or schools to make decisions in England (Adnett & Davies, 2003; Klein, 2017). While autonomy has been often applied to finance and site management, the national curriculum has prescribed instruction in England (Klein, 2017), which suggests that test-base logic can be often combined with other logics when implementing accountability policies. Research has explored whether this test-based accountability approach is successful in improving student achievement, though the findings are mixed (e.g., Carnoy, Loeb, & Smith, 2001; Lee & Reeves, 2012; Lee & Wong, 2004).

Process-based accountability. Lastly, we conceptualized a *process-based accountability* in which the system externally controls school processes but cedes control outcomes to the internal professionals they hired do the work. This form of accountability logic that emerges from our 2×2 matrix is one in which there is very little external control over testing outcomes, but where other process-based aspects of instruction are regulated externally (the lower right box in Figure 1). On the surface, this logic appears similar to professional-based accountability in that it cedes control over outcomes to local entities, but process-based accountability places more value on external controls in school processes such as hiring, curriculum, and budgeting.

We could not find direct examination of this logic in the education literature, but research findings show some evidence for this logic in particular functions. Some countries (e.g., Japan, South Korea, Spain, Sweden) strongly control some processes of schooling such as hiring and curriculum, but do not use external assessment for secondary school-leaving qualifications (Boyle, 2008; Bray, 2013). For instance, in South Korea, human resources management is controlled by national law; the governmental rules determine hiring, in-service development, and promotion processes (Lee & Kim, 2016). Some countries control school curriculum using standardized textbooks for political reasons. Taiwan used a national textbook policy before 2001 to promote patriotism and anticommunism (Lo, 2010). Schools in Japan choose textbooks for certain subjects, but all textbooks have to be authorized by the external authorities (Selden & Nozaki, 2009).

Overall, the bulk of the existing literature implies that while accountability has become the global norm, individual countries have invested control of school processes at different organizational levels to achieve accountability in education. While the framework we developed makes sense conceptually using our 2×2 matrix, and we have a strong evidence base in the literature, it is important to examine the degree to which these four different logics actually exist in schools cross-nationally, and how consistently these logics are applied within countries. One way to do this is to examine how individual countries adopt these logics in approaching to accountability. Tensions between internal and external and process and outcome in approaching to accountability can manifest itself in different ways across countries. Where one approach dominates, it can lead to coherent systems of accountability that reflect the underlying logic of local or external control of various schooling processes leading to educational improvement. Where there is disagreement about appropriate ways to support school improvement, it can also lead to different systems in different parts of a country. Such disagreements can lead to an incoherent system of accountability that mixes aspects of both approaches.

Building on these ideas, in the following sections, we empirically explore the different logics of accountability cross-nationally. We first focus on the degree of external controls at the school level that exists across key domains of school functions (assessment, human resource, curriculum, and budget) and how consistently those controls are enacted across the country. We then infer the underlying logic of the country's approach to accountability, and how consistently it is being applied. To explore international trends, we use country as our unit of analysis.

Methods for Identifying Logics of Accountability

To attain empirical evidence of logics of accountability, we analyzed the TALIS 2013, collected by the Organization for Economic Co-operation and Development (OECD). The data set provides background information of the school, teaching and learning environment, professional development, and working conditions of teachers and principals from 38 countries (including four sub-national entitles) [1], which is useful to analyze different education systems. We used principal surveys (at the lower-secondary schools—middle/jr. high schools in the US) and the final sample included 7,436 schools from 38 countries. Private schools were excluded because they have more independence regarding national (state) policy implementation. It is important to note that TALIS is broadly representative for most countries in the sample, however, for a few countries, the response rates were not high enough to support reliable estimates of country survey results.[2] We still report them here with the caveat that they may not be fully representative of the country's population estimates, but are still likely to provide us with critical information about what types of controls exist across the countries. We also acknowledge the limitation that we included five sub-national entitles to conduct country-level analyses; thus, our findings need to be interpreted carefully.

Measures

To measure the country's average external/internal control scores, we used four survey items about substantial responsibility for several key tasks in schooling as shown in Table 1: (1) establishing student assessment policies including national/regional assessments (assessment), (2) appointing or hiring teachers (human resource), (3) choosing learning materials that are used (curriculum), and (4) deciding on budget allocations (budget) within the school. These four questions were selected because each task is critical in determining school assessment, human resource, curriculum, and budget, respectively[3]. These questions asked school principals to answer

[1] These countries include five sub-national entitles: Abu Dhabi (United Arab Emirates), Alberta (Canada), England (United Kingdom), Flanders (Belgium), and Shanghai (China). Although these sub-national entitles do not represent their countries, we included them in our analysis to have partial information of these countries.

[2] The US did not meet the international standards for participation rates (75%) and was not included in the calculation for the international average from TALIS report. However, its participation rates for the US were high enough to report the US data independently (OECD, 2013).

[3] TALIS used 13 task questions to identify the key constructs we used here (TALIS, 2008). These questions were pulled from work by Hallinger (1994) and Quinn et al. (1996) identifying various tasks associated with principal management skills and are well established in the literature. TALIS then used these skills to identify areas of autonomy by principals. Using principal component analysis they identified 4 key areas (the first four eigenvalues) that explained 66% of the variance in the questions (OECD, 2010). The identified areas were those described above. Autonomy over assessment identified 3 items, human resources 5 items, budget only 2, and curriculum 3 items. When we examined the items, we determined the key item that identified the key power for administrators. We did this because, some of the constructs did not hold together conceptually well across only public schools and others used facially similar items. For example, with respect to human

whether the school principal, other members of the school management team, teachers, school governing board, and/or local, municipality/regional, state, or the national/federal educational authorities had a significant responsibility in decision making for each task. As this study focuses on external/internal controls at the school level, we created dummy variables for each item according to whether local, municipality/regional, state, or the national/federal authority is substantially responsible or not. Where entities outside the school (regional/district, state, national) were indicated to have substantial responsibility for the areas the variables were coded as "1", where individuals (principals or teachers) inside the school were indicated to have substantial responsibility for the areas the variables were coded as "0".

Table 1
TALIS Survey Questions and Metrics for Control at the School Level

Measures	Metric
Actual Question from Survey	
Regarding this school, who has a significant responsibility for the following tasks? A "significant responsibility" is one where an active role is played in decision making.	
Assessment	
Establishing student assessment policies, including <national/regional> assessment	"0" Internal; "1" External
Human Resource	
Appointing or hiring teachers	"0" Internal; "1" External
Curriculum	
Choosing which learning materials that are used	"0" Internal; "1" External
Budget	
Deciding on budget allocations within the school	"0" Internal; "1" External

Analytic Strategies

Defining country external control scores. To explore existing patterns of external/internal control in schools, we established criteria to characterize a country as having an "external", "internal", or "mixed internal/external" control structure. In order to do this, we first calculated each country's average external control scores using the questions about external controls discussed above in four different areas: student assessment, human resource, curriculum, and budget. This country-level score is a consistency measure that shows the percentage of public schools within the country that agree with the statement that significant levels of external controls exist in each domain of schooling in their country. Countries near 100% on this scale are countries where virtually all school principals agree that significant control of these areas external to the schools is the norm. Countries where the average is closer to 0% suggest that virtually all schools enjoy internal control in these areas. Where countries are closer to 50% there are many systems with

resources, principals having power over hiring was more important than power over starting salaries, salary increases, and allocating funds for teacher development. The key ability to shape their school practices was in the hiring decision. In public schools, it is unlikely that principals have control over salaries, so this could skew the composite results for public schools. Similarly, when it came to autonomy over assessment, choosing the actual assessments was more vital than determining discipline or admissions (which was not relevant to public schools). With respect to budget, formulating the budget and power to allocate local money were on their face identical, and finally, with respect to curriculum choosing the learning materials was most critical to curricular autonomy.

both internal and external controls reported—which suggests a lack of consistent investment of control a condition we call mixed control. Second, using these country-level scores, we created box plots within each domain and calculated standardized z-scores to look at distributions. Third, we also generated figures to explore how individual countries are distributed regarding the levels of external controls in each domain. Using the country level as the unit of analysis, we applied the final school weights for all the estimates to make outcomes representative of each country.[4]

Classification of country control type. Informed by a country's average scores and distribution, we classified countries into three groups within the domain: countries that have consistent external control, inconsistent control (mixed-control), and consistent internal control. In order to classify countries into these categories, we used three strategies. First, we set an *absolute criterion* for consistent internal control at below 10% and consistent external control at above 90% on our metrics.[5] Remember, countries above 90% have nearly all of the surveyed principals agreeing that control lies outside the school and countries below 10% have nearly all of their surveyed principals agreeing that control lies internal to the school. Second, where there were no countries that met the 10 or 90% criteria, we set a *relative criterion* by recognizing distribution as important and set schools that were more than 1.5 standard deviations above the mean as strong external, and 1.5 standard deviations below the mean as strong internal. In a standard normal distribution slightly fewer than 14% of all observations would be outside ±1.5 standard deviations which we concluded would be an appropriate subset of extreme values of relative consistency. While this relative measure is useful for normally distributed variables, it is clear that for some of our variables, the distribution is clearly non-normal. Third, in order to address possible non-linearity in the distributions, we set a *subjective criterion* by examining the distributions of the schools and looking for large jumps in percentage agreement which, we believe, represent different "regions" of agreement that might be substantively important. We sorted the countries by their consistency measure and noted relatively large jumps between countries on these distributions that act as "natural" break points between high and low consistency countries (see Appendix A). Where those jumps occur, we set a third criterion for inclusion.

Thus, we used absolute, relative, and subjective inclusion criteria for fitting our categories, creating a broad set of inclusion criteria for our grouping—when countries matched any of these criteria, they were included in our definition of "consistent" countries. That is, we used these three criteria inclusively in order to include as many possible countries in the category of countries applying either "consistently" external or "consistently" internal control. Using this multi-faceted grouping approach, we were able to look for patterns in control across the school functions we identified (student assessment, human resource, curriculum, and budget). Applying our new criteria, we examined those patterns to match country characteristics with our hypothesized key logics of accountability. We created three scatter plots using the country's average scores in assessment as the y-axis and the country's each average score in human resource, curriculum, and budget as the x-axis to identify the relations between controls in outcome and controls in processes of schooling. From these distributions, we identified four different categories of accountability logics.

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[4] These scores are representative of all countries that met the minimum criteria for survey responses as discussed above. Countries that did not receive sufficient response rates, were still given weights, however, their estimates must be examined with caution.

[5] The markers of 10% and 90% are widely used by social science researchers to represent the extremes of distributions across myriad areas of research including income (OECD, 2018), segregation (Orfield & Frakenberg, 2014; Reardon & Yun, 2001) and student performance (Jenks & Phillips, 2011).

Findings of Empirical Analysis

Country's Average External Control Scores

For the binary questions about external controls in the four different school functions (see Table 1), if the answer is "1", this means there is a substantial degree of external control outside school for that area of responsibility. If the answer is "0", this means there is a substantial degree of school-level decision making, which we defined as internal control. Thus, the country's average external control scores show the percentage of the schools that reported there were external controls in each category, within the country. Using the four binary items, we estimated the country's average external control scores at the school level in assessment, human resource (HR), curriculum, and budget. Table 2 shows each country's average external control scores.

Table 2
Average External Control Scores for the Countries

Country name	Code	Assessment	HR	Curriculum	Budget
Abu Dhabi	AAD	0.95	0.94	0.84	0.92
Australia	AUS	0.69	0.33	0.19	0.14
BelgiumFlanders	BFL	0.09	0.02	0.03	0.11
Bulgaria	BGR	0.51	0.03	0.11	0.24
Brazil	BRA	0.70	0.84	0.27	0.55
Canada Alberta	CAB	0.79	0.33	0.50	0.33
Chile	CHL	0.37	0.80	0.15	0.79
China Shanghai	CSH	0.42	0.34	0.42	0.29
Cyprus	CYP	0.40	0.92	0.85	0.74
Czech Republic	CZE	0.04	0.01	0.01	0.11
Denmark	DNK	0.46	0.04	0.00	0.02
England	ENG	0.14	0.03	0.00	0.03
Spain	ESP	0.90	1.00	0.09	0.63
Estonia	EST	0.10	0.08	0.09	0.43
Finland	FIN	0.56	0.54	0.03	0.16
France	FRA	0.74	0.89	0.15	0.10
Georgia	GEO	0.66	0.04	0.21	0.03
Croatia	HRV	0.62	0.10	0.25	0.38
Island	ISL	0.38	0.08	0.07	0.46
Israel	ISR	0.45	0.36	0.48	0.47
Italia	ITA	0.51	0.50	0.01	0.15
Japan	JPN	0.21	0.96	0.87	0.53
Korea	KOR	0.59	0.80	0.03	0.04
Latvia	LVA	0.42	0.02	0.28	0.60
Mexico	MEX	0.87	0.87	0.19	0.61
Malaysia	MYS	0.94	0.97	0.39	0.84
Netherlands	NLD	0.09	0.00	0.00	0.00
Norway	NOR	0.68	0.31	0.09	0.30
New Zealand	NZL	0.32	0.01	0.05	0.04
Poland	POL	0.11	0.18	0.04	0.50
Portugal	PRT	0.76	0.43	0.14	0.27
Romania	ROU	0.77	0.64	0.23	0.81
Russia	RUS	0.62	0.05	0.43	0.28
Singapore	SGP	0.40	0.92	0.34	0.13

Table 2 cont.
Average External Control Scores for the Countries

Country name	Code	Assessment	HR	Curriculum	Budget
Serbia	SRB	0.58	0.08	0.11	0.34
Slovakia	SVK	0.02	0.03	0.03	0.35
Sweden	SWE	0.38	0.06	0.01	0.07
United States	USA	0.71	0.22	0.43	0.25
Totals		0.61	0.47	0.31	0.39

This external control score can be interpreted as the share of schools in the sample that reported external control on this variable. Across all countries, the total mean scores of external control in assessment, HR, curriculum, and budget are: 0.61, 0.47, 0.31, and 0.39, respectively. This suggests, on average, countries hold relatively higher levels of external control in assessment and relatively lower levels of external control in curriculum and budget within their schools. The mean score of the external control in HR was higher than that of curriculum and budget and lower than that of assessment. Interestingly, in Spain (ESP) 100% of public schools reported external controls in hiring or appointing teachers. On the other hand, Denmark (DNK) and England (ENG) zero schools reported external controls, which suggests 100% of the schools in these countries have the autonomy to choose their learning materials. Notably, Netherland (NLD) has a score of "0" for HR, curriculum, and budget showing that 100% of the schools within the country reported internal controls in these three school functions. The country-level average scores suggest that there are large variations in the level of external controls within and across the domains of school functions.

Distribution of Country's External Control Scores

In order to examine the distribution of a country's average external control scores, we created box plots for each category—assessment, HR, curriculum, and budget as shown in Figure 2.

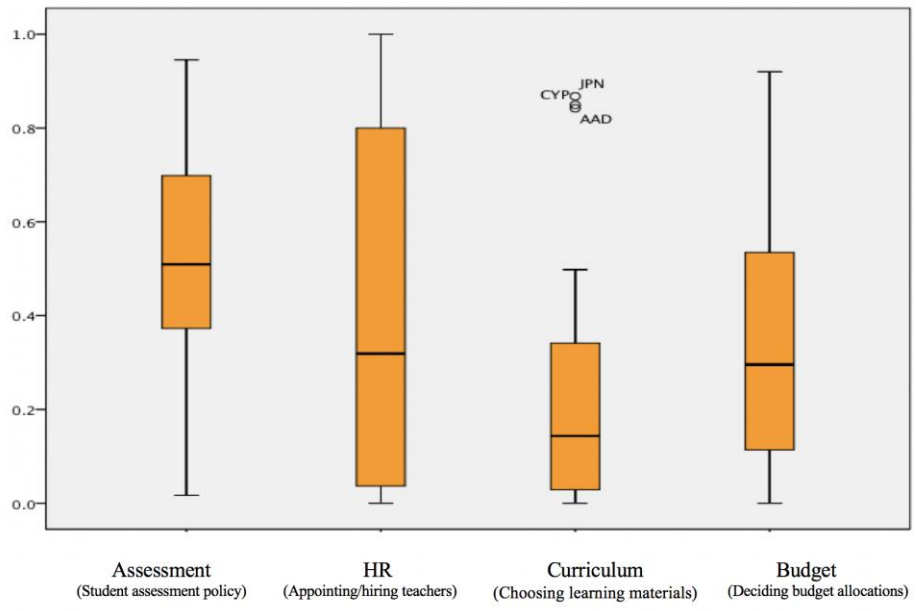

Figure 2. Box plots of country's average external control scores

The box plot helps us understand the distribution of data by showing points of minimum, first quartile, median, third quartile, and maximum. In the distribution of assessment, the median is around 0.50, which means half of the countries have their average external control scores below or above around 0.50 in assessment. When compared with the mean for this same variable (0.61), the fact that the mean and median are so far apart suggests that the distribution of accountability scores is non-normal and skews high, pulling the mean up. The lowest median was in curriculum, which shows half of the countries have their average external control scores below 0.15. That is, most countries' principals agreed that they had substantial internal control over curriculum compared to the other three areas (assessment, HR, and budget). For curricular autonomy, the median and mean are quite far apart with the median (0.15) set at half the value of the mean (0.31), suggesting that most of the observations for curricular control skew towards internal control, but those that report external control have a much higher dispersion pulling the mean up. The median of HR and budget were similar to each other (around 0.30) However, normality of the distributions is unlikely for HR given the more than 10-point difference between the mean and median with the mean higher—suggesting more dispersion above the median. In terms of range, HR shows the largest range (0–1), which suggests that countries' levels of agreement with external control in HR have the most extreme values across countries. The curriculum domain shows the smallest range with three notable outliers, Abu Dhabi (AAD), Cyprus (CYP), and Japan (JPN) where principals report very high levels of external curricular control. The distribution of budget is less variable than HR and more variable than that of curriculum. Interestingly, across all the domains, the minimum scores are closed to zero, but the maximum scores are more variable. Thus, we found that, within the school functions, countries' levels of agreement on external controls vary, and these patterns are different across the areas of school function.

Categories of Control

As we discussed in the measures section above, the distributions of the external control scores suggest that there is a range of different internal/external control metrics in our data. In order to simplify our analysis and identify countries where there is high agreement about where the locus of control resides, we divided the distributions into three categories defined by our three criteria of extremity discussed above: (1) consistent high external control, (2) consistent high internal (low external) control, or (3) inconsistent (mixed) control. These categories allow us to identify countries that are consistently locating control of these critical areas of education internally or externally at the building level. Using these categories and our consistency criteria, we coded all individual countries into these three different types as shown in Table 3.

Table 3 shows that in assessment, the majority of the countries (26) were included in the mixed control group while only four countries were in the consistent external control group. In HR, 16 countries were found to have reported consistent internal control and 11 countries were categorized as consistent external control. In curriculum, only three countries met the criteria for consistent external control and 22 countries met the criteria for consistent internal control. In budget, we assigned 19 countries to the mixed control group and eight countries to the consistent internal control group. Given these categories, we were then able to examine where these countries fell jointly across four of these educational responsibilities allowing us to identify countries that have organizational responsibilities assigned in ways that are consistent with specific logics of accountability.

Table 3
Levels of External Control

Levels	Assessment		Human resources		Curriculum		Budget	
Consistent external control	AAD	MYS	AAD	JPN	AAD		AAD	MYS
	ESP	MEX	BRA	KOR	CYP		CHL	ROU
			CHL	MEX	JPN		CYP	
			CYP	MYS				
			ESP	SGP				
			FRA					
Inconsistent control (mixed control)	AUS	ISR	AUS	NOR	BRA	MEX	BGR	LVA
	BGR	ITA	CAB	POL	CAB	MYS	BRA	MEX
	BRA	KOR	CSH	PRT	CSH	ROU	CAB	NOR
	CAB	LVA	FIN	ROU	GEO	RUS	CSH	POL
	CHL	NOR	ISR	USA	HRV	SGP	ESP	PRT
	CSH	NZL	ITA		ISR	USA	EST	RUS
	CYP	PRT			LVA		HRV	SRB
	DNK	ROU					ISL	SVK
	FIN	RUS					ISR	USA
	FRA	SGP					JPN	
	GEO	SRB						
	HRV	SWE						
	ISL	USA						
Consistent internal control	*BFL*	JPN	*BFL*	ISL	AUS	ISL	AUS	GEO
	CZE	*NLD*	BGR	LVA	*BFL*	ITA	*BFL*	ITA
	ENG	POL	*CZE*	*NLD*	BGR	KOR	*CZE*	KOR
	EST	SVK	DNK	NZL	CHL	*NLD*	DNK	*NLD*
			ENG	RUS	*CZE*	NOR	*ENG*	NZL
			EST	SRB	DNK	NZL	FIN	SGP
			GEO	SVK	*ENG*	POL	FRA	SWE
			HRV	SWE	ESP	PRT		
					EST	SRB		
					FIN	SVK		
					FRA	SWE		

Note. Country lists are all alphabetically ordered within categories.

Identifying Consistent Logics of Accountability across Countries

If we examine Table 3, there is some evidence to suggest that countries employ different logics of accountability. Our underlying assumption is that accountability on any of the school functions is predicated on the idea that the country wants to ensure that schools do what is in the country's best interest and that investing different types of control at different organizational levels is more conducive to some accountability approaches than to others. There are multiple ways to achieve accountability using high external or internal controls in different school functions. In this paper, drawing on Patil et al. (2014), we define student assessment into control of outcomes and the other three areas (HR, curriculum, and budget) into control of processes. Utilizing the four theoretically possible logics of accountability that we developed (as illustrated in Figure 1), we examined the degree to which these pure logics exist across countries in the TALIS data.

In order to examine the degree to which our four theoretical logics of accountability manifest in the TALIS countries, we created scatter plots using assessment as an outcome on the y-axis and HR, curriculum, and budget as processes on the each x-axis. Figure 3 shows relationships between controls in processes and outcomes of school functions.

In these scatter plots, we found some countries that clearly fit into three of the four categories. Abu Dhabi (AAD) is consistently high on all aspects of the four metrics with high values for external assessment, HR, budget, and curricular controls, which places it in the control-based logic of accountability. Several European countries and regions (England (ENG), the Netherlands (NLD), Belgium (BFL), and the Czech Republic (CZE)) appear to have high internal control (values close to 0) in all four areas, which suggests classification into the area of professional-based accountability logic. Figure 3 also shows that Japan is the country that applies the logic of process-based accountability most closely with high external accountability on two of the processes of schooling (HR, curriculum) and low external accountability in assessment.[6] Finally, Figure 3 shows that there are *no countries* that consistently apply the test-based logic (high external control over assessment and low external control over the processes of education). Given the prevalence of this approach in the literature, we assumed that there would be many countries that followed test-based accountability approaches because recent research has highlighted utilization of assessment as a popular approach to increase accountability in schooling. These studies reported evidence of current policies using a high-stake testing in multiple countries including U.S. and England (Adnett & Davies, 2003; Bae, 2018; Klein, 2017; Lee & Amo, 2017). However, our analysis showed that test-based accountability approaches do not necessarily grant autonomy at the school level.

Moreover, Figure 3 shows that nearly all countries reside near the middle of all the distributions which suggests an inconsistent application of these principles of autonomy across countries. For example, the US has below average external controls in HR and budget and above average external controls in assessment. In curriculum, the U.S. has an above average share of external control in deciding learning materials compared to other countries. However, for the US, there is no area where more than 80% or fewer than 20% of principals indicate that control of that aspect of education resides external to the school. Overall, in most countries, none of the organizational structures are vesting control in ways that are consistent with any clearly articulable logic of accountability. This pattern may suggest that instead of the logics of accountability being applied rationally, and consistently in countries there may be a mixed logic motivated by political intention (loose coupling), lack of attention, or differential decision making at a higher level than the school (district, county, or state levels).

[6] With respect to budget Japan is in the mixed category, but since it was so high on the other two processes and in the top quartile of budgeting, we felt that it could act as a reasonable exemplar for the process-based logic of accountability.

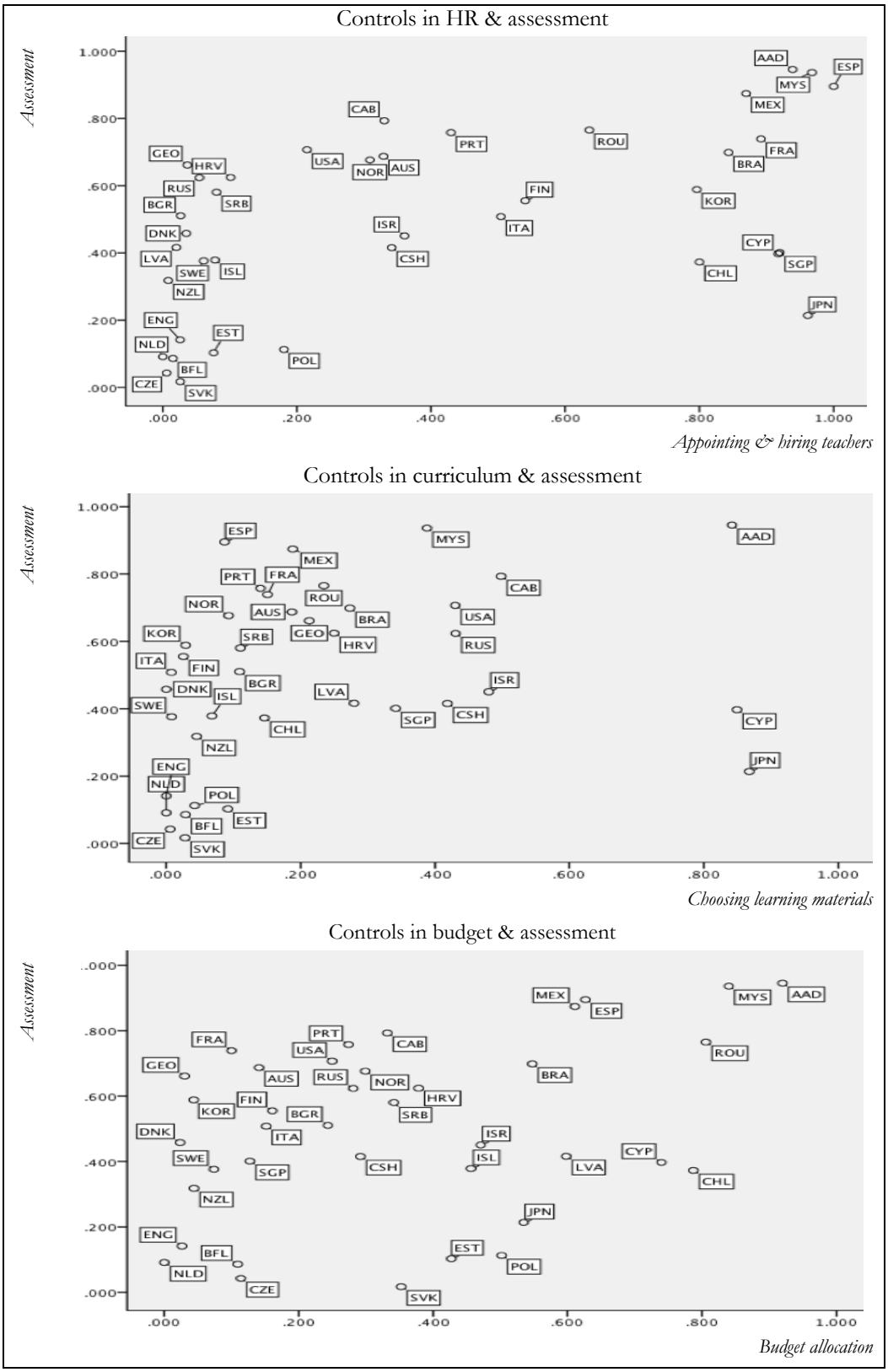

Figure 3. Scatter plots: Relations between controls in processes and controls in outcomes

Discussion

In this study, we aimed to theorize multiple logics of accountability by using a systematic approach for the mapping of controls across the countries. While bottom-up educational reforms have focused on promoting school-level decision making, recent education policy discourses have mostly been replaced by accountability (Bae, 2018; Edwards & DeMatthews, 2014; Lee & Amo, 2017; McDermott, 2011; Sahlberg, 2010). This study developed a logics of accountability framework through a review of the literature and explored these multiple logics of accountability, analyzing the TALIS data. We conceptualized four logics of accountability using a 2×2 model for control over outcomes and processes. We then examined the degree to which these logics have analogs in practice. The analysis revealed that only a few countries followed a relatively pure form of control-based, professional-based, and process-based logic; and, most countries followed some sort of mixed-form of logic.

No Pure Form of Test-Based Accountability

Interestingly, none of the countries consistently applied any pure form of test-based logic of accountability to the school functions even though test-based accountability approaches have been dominant in literature and policy agendas over the past few decades (Ingersoll & Collins, 2017; Lee & Amo, 2017; McDermotte, 2011; Sahlberg, 2010). Edwards and DeMatthews (2014) suggested, decentralization reforms were replaced by an accountability agenda in education policies, but none of this is evident in our study of TALIS data. Instead, our analysis shows the countries that externally control their assessments do not consistently report local autonomy with respect to school processes. This directly contradicts the logic of test-based accountability which sets the standards for schooling outcomes while granting autonomy in terms of processes to get results.

Our analysis also revealed that most countries followed a mixed form of logic while a few countries followed a relatively pure form of accountability logic. This implies that most countries have variations in implementing accountability policies across regions or schools within their education systems. The international research literature suggests that this may be the case (e.g., Han & Ye, 2017; Holloway et al., 2017; Kuiper et al., 2013; La Londe, 2017; Lim, 2016; Maroy et al., 2017; Rasmussen & Zou, 2014).

Possible Explanations for Mixed Forms Findings

We posit three possible explanations for the inconsistency across the countries in our analysis. First, it is possible that national- and state-level policies give autonomy to provincial and/or local authorities in executing policy messages (e.g., Stosich et al., 2018; Thiel & Bellmann, 2017). In this case, some regions and districts may allow internal controls within schools, while others may not. This may result in a country applying different types and levels of controls across different school processes (e.g., high external control in HR but low external control in curriculum). Therefore, more attention should be paid to how the underlying logic of accountability may manifest across these different functions (Bray, 2013) and at different levels of aggregation (district, county, state, etc.). In addition, our metrics of internal and external controls may not fully capture the specific nature of accountability in these countries. Since we defined external control as controls from authorities outside the school, both local- and state/national-level controls were considered external controls. Thus, in countries like the US where controls in schools were found to be mixed, if we had separate data on district-wide controls conditions, it might be more consistently tilted toward local control at the district rather than the school level.

Second, even if school internal controls (or external controls) are established by policy at the national level, school principals' perception of external controls may vary depending on individual,

school, and country characteristics. These complex local realities in which school principals perceive external controls may affect their reporting of levels of control. While education policy makers may assume that they are delivering a clear message of accountability, research suggests that school principals often encounter multiple accountabilities and manage conflicting values and directions depending on myriad internal and external factors (Firestone & Shipps, 2005; Gonzalez & Firestone, 2013). Our results extend these findings from the individual level to the country level by providing empirical evidence that school principals' perceptions on controls in school functions are not consistent in many countries.

Third, to some degree, a country's social and cultural norms can influence the inconsistency of responses to external controls (Rasmussen & Zou, 2014). Some societies may have high levels of agreement with governmental approaches to school systems while others may not (e.g., Klein, 2017; Lim, 2016; Lo, 2010; Maroy et al., 2017; Rasmussen & Zou, 2014). Thus, in countries where they may be underlying disagreements about which logic of accountability to follow for particular functions of schooling a mixed overall logic of accountability is inevitable.

Other Pure Forms of Accountability

Professional-based accountability. We did find certain countries applying a pure form of accountability logic other than test-based accountability. For decades, many researchers have tried to show that high quality education systems often apply professional-based accountability by valuing decision making at the school level. Our analysis revealed that there are certain countries (regions) that consistently apply professional-based logic of accountability in school practices: England, Netherland, Belgium (Flanders), and the Czech Republic. Interestingly, unlike existing studies that suggest education in England is driven by high-stakes accountability using the centralized assessment at key stages alongside market forces (Adnett & Davies, 2003; Klein, 2017), our analysis revealed that principals in England consistently reported internal control in key areas of schooling including assessment. This discrepancy indicates that perceived controls at the school level can be different from what official policy documents state in the countries. That is, the existence of accountability system itself may not always explain how local actors within the system perceive controls and practice accountability (e.g., Darling-Hammond, 2007; Elmore, 2004; Lee & Reeves, 2012). Our analysis implies that the existence of national curriculum and tests for key stages in England may not hinder schools in exerting internal controls in their choice of learning materials.

Other countries like Korea where a strong centralized national curriculum exists also showed consistent internal controls in curriculum. These cases imply that, to some extent, in contexts with strong national curricula, school-level control can still exist when the district and regional levels provide a wide latitude to schools to make the detailed decisions necessary to enact a national curriculum at the classroom level. This suggests that the behavior of regional and district actors may strongly influence how individuals in schools perceive their own accountability more directly than controls from the national level since the national controls are so remote. Thus, a professional-based accountability logic can still exist within the context of a centralized national curriculum, particularly if the practice of curriculum can be strongly shaped in the classroom regardless of the specifics of the mandated curriculum.

It is also important to note that while researchers often have considered Finnish education systems as professionally-driven with high internal accountability, our analysis found that school-level internal controls were consistent only in curriculum and budget allocations whereas hiring and assessment showed inconsistent mixed controls within the country. Thus, countries may not uniformly apply the same logic in different areas of schooling, which calls for careful understanding and interpretation of a country's accountability systems.

Control- and process-based accountability. We also found the existence of control-based (Abu Dhabi) and process-based (Japan) logics of accountability in school practice. These logics are not often discussed since decentralization reform discourses became popular, but our analysis suggests that there are education systems where external controls play the dominant role in key areas of schooling. While both forms exist and observable theoretically, recent studies have not attended these forms; therefore, empirical evidence is scarce. Control-based logics can be the underlying assumption of centralization approaches in education systems. For the recent decades, policy discourses have framed decentralization as an idea-typical model; therefore, research has not attended control-based logics. However, our analysis showed an empirical example of this logic existing within the education system. Similarly, our theoretical distinction between process and outcome accountability showed that process-based accountability exists in education empirically. While multiple researchers advocated the process-focused support in education reforms (e.g., Darling-Hammond, 2007; Fullan et al., 2015; Mourshed et al., 2010), the results showed how process-based logics may work in educational accountability. Thus, our results offer cases for future research to explore how control-based and process-based logics of accountability work in these contexts.

Limitations

There are some key limitations to this work, many of which were already discussed above. First, the use of single questions to specify control in the four domains may be somewhat problematic since, in general, single items are less reliable than multiple items. However, we believe that this limitation is somewhat mitigated by our approach of using each of these questions as simple indicators across all the schools in the country. Unless there were a systematic reason why participants in a particular country would incorrectly specify the answers to the question (for example the translation was poor), it is likely that errors would even out across countries as a whole. In addition, since we are interested in relatively extreme values (which indicate strong agreement across the country) it is unlikely that a single indicator would miss such a strong "signal".

Second, we are assuming that the meaning of principals having "significant responsibilities" is the same across different accountability regimes and are somewhat independent of one another. It is possible, that responsibilities and expectations in the construct areas may be different depending on the values of the others, or the cultural/historical conditions that exist in the particular countries. Without an in-depth historical case in each country, parsing out these understandings is nearly impossible. However, we believe that our analysis, may point to particular countries that may address some of these possibilities, and allow for the depth of analysis that could bring some of these differences to light.

Finally, our indicators define "external" control as control outside the school. It is possible that the respondents are viewing "outside the school" as more regional than national. If philosophies differ by region, then this could account for the relatively inconsistent implementation of accountability logics within countries. It is entirely possible that there are consistent logics within region, which would be invisible to our analysis and manifest as "mixed" logics.

Future Directions

While these limitations are very real and should be acknowledged, they do not affect the value of this approach to categorizing logics, nor our theoretical typology of pure logics of accountability (see Figure 1) which could be used in different ways and on different data to address the above limitations. Our findings suggest critical points to catalyze further discussions about the logics of accountability. Building on this study, future research can extend our findings at the district or state level and examine whether the logic of accountability at the school level reflects the logic of

accountability at higher levels of aggregation. It will be interesting to explore controls at multiple levels (e.g., district, state, federal) beyond the school level because this paper focused on internal controls within schools and not elsewhere which could have biased our results. By analyzing policy documents, future studies can compare official statements of accountability logics at the country level and school principals' perceived controls at the school level. Moreover, future research can further explore logics of accountability by regressing country-level achievement to the consistency of application of any specific logic of accountability. Where this approach may identify key relationships between achievement and particular approaches, a closer look at how the logics are applied in those settings would be warranted.

Conclusion

Overall, our evidence suggests that we should be open to understanding multiple logics as possible approaches to implement accountability in school practice beyond test-based logic. Findings of this study also indicate that very few countries actually implement any consistent logic of accountability across the country. In discussing accountability, research has often focused on prescribed curriculum and/or standardized assessment. However, as scholars have noted that "accountability" the term itself is complex and its enactment is contextualized (Dubnick, 2014; Holloway et al., 2017; Stosich et al., 2018; Thiel & Bellmann, 2017). Given this, we should avoid a narrow understanding accountability as a one-dimensional approach and try to explore local contexts that shape different accountability practices and be aware that different interests may interact with the pure accountability logics to create the mixed forms of accountability that we see as the dominant mode across the countries in our sample.

Appendix A

Application of Subjective Criterion for Grouping Countries

We sorted the countries by their consistency measure as shown in Figure A1, and we noted relatively large jumps between countries on these distributions that act as "natural" break points between high and low consistency countries. We set a third criterion for inclusion where those jumps occur.

For example, in the student assessment figure (in the upper left side), the 1.5 SD did not identify clear differences between groups, yet there identified natural break points in the distribution. Thus, we would move Mexico (MEX) into high external control group on the basis of their location on the distribution beyond one of the key break points in the distribution. Similarly, the HR figure (in the upper right side) shows a big jump between Romania (ROU) and Chile (CHL), thus justifying the addition of Brazil (BRA), Chile (CHL), and Korea (KOR) into the high external control group.

In practice, when grouping, for most variables only one or two of the criteria were binding. For example, on variables where there was a lot of dispersion the 90/10 criteria tended to be binding for extreme values. Where there was not a lot of dispersion, the qualitative sorting mechanism was used to provide some measure of realistic extremity or extremity within distribution.

Figure A1. Consistency measure of the countries

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About the Authors

Taeyeon Kim
Michigan State University
kimtaeye@msu.edu
http://orcid.org/0000-0002-2020-9851
Taeyeon Kim is a PhD candidate in the Department of Educational Administration at Michigan State University. Her research interests include leadership development, the intersections of policy and leadership practice, and the links between education and social change. She is also interested in comparative perspectives on policy and school reform.

John T. Yun
Michigan State University
jyun@msu.edu
John T. Yun is Associate Professor in the Department of Educational Administration at Michigan State University. His research focuses on issues of equity in education, including persistence in higher education, patterns of school segregation, the effect of poverty and opportunity on educational outcomes, the educative/counter-educative impacts of high-stakes testing, and the power of evaluation to impact policy and practice.

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