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Manager 'Growth Mindset' and Resource Management Practices

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Abstract: We study the relation between a manager's growth mindset and their use of resource management practices. Growth mindset is based on implicit person theory and is an established and measurable psychological construct. It refers to a person's deeply held beliefs about whether, in general, people can learn, develop, and change throughout their lives or whether "who they are" is relatively fixed by initial talent endowments (termed a 'fixed mindset'). Given the demonstrated importance of a growth mindset for educational outcomes and the emerging research studying the influence of mindset on behavior within organizations, we explore whether school principals' mindset is associated with their resource management practices. Using survey and archival data from 257 primary and secondary school principals, we find that a growth mindset is associated with greater use of budgets to explain and discuss budget variances with key constituents and as an enabler in their managerial role. Principals with a growth mindset also engage in fundraising activities and use non-financial rewards for their teachers significantly more than fixed mindset principals. We also find that the relations between a principal's mindset and some of these practices are different depending on the school's performance context.

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1. INTRODUCTION

It is now well recognized that the personal traits or characteristics[1] of top managers are associated with accounting and financing choices (Abernethy & Wallis, 2019; Plöckinger, Aschauer, Hiebl, & Rohatschek, 2016). Prior research examines the association of a variety of personal traits (e.g., narcissism, integrity, overconfidence, ability, cultural origin) with financial accounting choices, including decisions related to earnings management, investments, accounting quality, management disclosures, misreporting, and fraud. We extend this line of inquiry by assessing how a manager's mindset, as conceptualized by Dweck (1986), influences management resource management practices. Drawing on theoretical arguments in the psychology, management and accounting literature, we examine whether the behavior of managers with a 'growth mindset' differs predictably from those with a 'fixed mindset' in relation to budgeting, revenue-raising, selection of employees and the use of rewards.[2]

Mindset refers to a person's deeply held beliefs about whether, in general, people have the capacity to learn, develop, and change throughout their lives (termed a 'growth mindset' (GMS)), or whether "who they are" is relatively fixed by initial talent endowments (termed a 'fixed mindset' (FMS)) (Dweck, 1986). The term 'mindset' is based on implicit person theory and is an established and measurable psychological construct (Chiu, Hong, & Dweck, 1997).[3] Burnette, Oboyle, Vanepps, Pollack and Finkel (2013) provide a meta-analysis of research in this area and develop a framework that describes the mechanisms that underpin the relation between mindset and goal achievement. They link implicit person theory to self-control theory to compare the self-regulatory processes of individuals with a growth mindset with those who have a fixed

[1] Traits and characteristics are used interchangeably to refer to features of personality or primitives that manifest themselves in the decisions a person makes or how they behave (e.g. testosterone level has been found to impact a manager's accounting choices).

[2] While mindset can be analyzed at the individual and organizational levels, we focus on the former in this paper as we are interested in how the mindset of the top manager influences the resource management practices in the organization. This is important as variations in a leader's practices that are driven by mindset may in turn have an effect on the organization's mindset (Canning et al., 2020). An organizational mindset refers to the shared beliefs of people in an organization setting on whether talent is fixed vs. malleable (Murphy & Dweck, 2010; Canning et al, 2020)

[3] Mindset is measured on a continuum with the two extremes labelled growth mindset and fixed mindset (Dweck, 2006; Ehrlinger, 2008).

mindset. Burnette et al. (2013) conceptualize the self-regulation mechanism into three processes; goal setting, goal operating strategies and goal monitoring strategies. They provide evidence that the behavior of those with a growth mindset differs from those with a fixed mindset. For example, growth mindset individuals are more likely to set learning goals (e.g., learn a new skill, mastery of a task), engage in mastery-oriented strategies directed at improving performance (e.g., increase effort, seek help from others, try new strategies), embrace challenges, welcome feedback on performance against goals, capitalize on setbacks, and view feedback as a learning opportunity that enables improvement of oneself and others (Dweck, 2016). The empirical evidence indicates that fixed mindset individuals focus on performance goals (e.g., achieve 90% on the test, coming first amongst peers), but adopt 'helpless-oriented' strategies; for example, being defensive and avoiding challenges, giving up when tasks get hard, and losing motivation or having negative emotions when setbacks occur. While the Burnette et al. (2013) framework explains individual differences in behavior, we extend this reasoning to hypothesize that the behaviors associated with different self-regulatory processes are associated with differences in resource management practices.

The research setting is government schools in a large state in Australia, where we focus on the mindset of school principals as it relates to resource management. This is a particularly useful setting to study the association between mindset and resource management practices for several reasons. First, mindset was initially identified and measured in the education sector, and a growth mindset has been widely used to predict teacher and student-level effects on student learning outcomes (e.g., Blackwell, Trzesniewski, & Dweck, 2007; Dweck, 2014a). Second, although our theorized associations between manager mindset and resource management practices are not premised on an industry setting, prior research documents 'principal fixed effects' on school outcomes (Helal & Coellli, 2016; Branch, Hanushek, & Rivkin, 2013). This naturally raises the question of whether these principal effects vary with principal traits similar to the 'manager effect' documented by researchers in the financial accounting and finance literatures. Third, there are potentially significant practical implications arising from our study as there is currently a push to develop the growth mindset of both students and employees in the education sector around the world because of its demonstrated benefits for educational outcomes (Florida Department of

Education, n.d.; Morgan, 2015; Ministry of Education New Zealand, 2017; Hogan, 2014). Finally, we have little understanding of what determines the use of management control practices in the education sector despite its economic and societal importance.

While early mindset research largely focuses on its impact on student outcomes, its relevance to other sectors is emerging. For example, management scholars have found that supervisor mindsets affect coaching and performance evaluations (e.g., Heslin, Latham, & VandeWale, 2005; Heslin & VandeWale, 2011). More recently, mindsets have been found to affect organizational level variables such as culture, and employees' trust, commitment and engagement (Canning et. al. 2020; Keating & Heslin, 2015). Building on these findings, we investigate the association between a principal's mindset and her approach to the management of financial and human resources, which are the key resources under her control (Greenwald, Hedges, & Laine, 1996; Cobb-Clark & Jha, 2016; Rockoff, 2004).

We investigate the determinants of resource management practices individually and, consistent with prior research, we test whether they are a system of jointly determined, inter-related practices (Bedford et. al. 2016; Sandelin, 2008; Davila 2005; Widener, 2007; Journeault, 2016).[4] In the research setting, financial resource management includes both how principals use the budget and their approach to raising revenues to expand the resources available to the school.[5] Human resource management includes the selection of teachers and the use of rewards. We expect principal mindset to influence these resource management practices because they are mechanisms for promoting organizational learning (Burchell, Clubb, Hopwood, Hughes, & Nahapiet, 1980; Simons, 1995). We expect all resource management practices resources to be jointly determined as a system of inter-related management practices and model the system of hypothesized relationships accordingly to avoid spurious conclusions that may arise if these not taken into account (Chenhall, 2003).

[4] Grabner and Moers (2013) distinguish between a package of independent management controls and a system of jointly determined and inter-related management controls. After testing hypotheses about the determinants of resource management practices, we test whether the data are consistent with resource management practices being a "system."
[5] Practices for raising revenues from, for example, community donations, are a financial management practice for our education setting. Although common in not-for-profit organizational settings (e.g., performing arts organizations, hospitals, and medical research foundations); they would not be common in for-profit organizations.

Following an exploratory phase of the study to inform and refine the research questions, we collect survey data and archival data from 257 primary and secondary schools and their principals (i.e., the top manager) to evaluate the fit of the data to the hypothesized structural equation model (SEM) relating principals' mindset to the resource management practices. The results generally support the hypotheses that mindset influences a principal's use of resource management practices. When it comes to managing financial resources, GMS is positively associated with the use of the budget to enhance learning amongst all stakeholders through discussions and explanations of the school's financial outcomes vis-à-vis the budget. GMS managers also view budgets as 'enabling' them to be more innovative and flexible, to better communicate their strategic goals, to shape the culture of the school, and overall, to enable them to be a better principal. When it comes to entrepreneurial efforts to raise revenues, GMS managers are more likely to undertake such activities because they are less likely to accept the financial constraints imposed by central funding authorities, but rather, seek opportunities to expand resources through fund raising efforts. Turning to human resources, we find no evidence of differences in the selection processes of GMS and FMS managers, but we do see differences in how principals reward employees. GMS managers make greater use of non-financial rewards, but mindset has no association with the use of financial rewards.

In additional analysis, we find that school performance provides an important contextual backdrop against which the principals manage resources. In particular, the association between mindset and two of the resource management practices differ significantly between high and low performing schools. Growth mindset is positively related to fundraising, and the use of financial rewards in low performing schools but not in high performing schools, and the differences are significant. A GMS principal in a low performing school is more likely to engage in fundraising to supplement funding provided by the government compared to a FMS principal. However, in high performing schools, the difference in fundraising between GMS and FMS is not significant. Similarly, in low performing schools, we find that GMS principals are more willing than FMS principals to depart from education sector norms and use financial rewards more extensively.

This study adds to what we know about manager effects on accounting practices. Much of the manager effects literature uses crude, publicly available proxies for manager traits and presumes that traits

of a single top manager influence firm-level accounting choices. We survey principals directly to learn about their resource management practices and use an established scale for measuring their mindset to develop a reliable test of the predicted associations. A strength of this research setting is the comparatively flat management structure, which ensures that the manager effects of school principals are unlikely to be confounded by the influence of other senior executives. Prior research has demonstrated the importance of mindset to the work of teachers and students. The question of whether mindset matters to the work of managers is more recent (Heslin et al., 2005; Murphy & Dweck, 2016). We bridge the manager effects and the mindset literature by demonstrating that mindset matters to the management of schools.

We contribute to the budgeting literature, which has devoted limited attention to uses of budgets other than for performance evaluation and budgeting in different organizational contexts (see Becker, Mahlendorf, Schäffer, & Thaten, 2016 as an exception). In particular, we add to the literature that explores the learning dimension of accounting (e.g., Argyris, 1977; Simons, 1991; Bisbe & Otley, 2004; Henri, 2006). We further contribute to the literature on the determinants of accounting practices by providing preliminary evidence that organizational performance is a contextual variable that shapes some of these practices. Archival studies of the determinants of CEO pay or the types of performance measures used in pay contracts typically include firm performance as an independent variable. In contrast, we find that prior school performance has no direct effect on resource management practices but moderates the relation between principal mindset and some of the resource management practices. Finally, we undertake this study in the education sector, which has received very little attention in the accounting or management literature despite its significance to the economy and society.[6]

The paper is organized into five sections. Section 2 reviews relevant research and develops the research hypotheses. Section 3 describes the research methods and variable measures. Section 4 presents

[6] The education sector accounts for roughly 5% of gross domestic product and public spending in countries such as Australia and the United States (The World Bank, 2015). It is also important to society more generally; learning outcomes are a strong predictor of citizens' well-being and there is strong public interest in school performance.

and discusses the results of testing the research model. Section 5 presents additional analysis and Section 6 concludes.

2. RELEVANT LITERATURE AND RESEARCH QUESTIONS

Over 30 years ago, management scholars posited that the choices senior managers make within an organization are predicted by their managerial characteristics and traits (Hambrick & Mason, 1984). Almost 20 years later, Bertrand and Schoar (2003) demonstrated that senior managers have a significant effect on firm behavior, incremental to economic factors. These seminal papers have influenced empirical accounting research[7] that typically uses large public archival databases to examine the relation between managerial traits and financial reporting choices and/or financing decisions (e.g., accruals quality, accounting fraud, disclosures, and investments). However, there has been little attention devoted to other choices that senior managers influence, namely broader resource management choices.

We extend prior research on the 'manager effect' by examining resource management practices adopted by senior managers. Bloom and Van Reenen's (2007, 2010) survey of 30,000 managers in 17 countries documents differences in management practices and links those differences to economic and other contextual factors. They classify management practices into what are generally considered elements of a management control system, namely practices for monitoring, setting targets, performance appraisal, and rewards (e.g., bonuses and promotion). Bloom and van Reenen start from the premise that there are good and bad management practices and that differences in contextual factors across countries can explain differences in the adoption of practices. They acknowledge that the differences observed in management practices in seemingly similar organizations may be due to the characteristics of individual managers.[8]

[7] See two recent reviews (Abernethy & Wallis, 2019; Plöckinger, Aschauer, Hiebl, & Rohatschek, 2016).
[8] Of course, differences may also reflect "errors" if managers are unaware of important management practices or are unwilling or unable to effectively implement them (Abernethy, Hung, & van Lent, 2020).

We hypothesize that a manager's mindset is associated with their management practices and that this trait is particularly salient in explaining differences in resource management practices.[9] Mindset is based on implicit person theory and is defined by Dweck (1986) as an individual's implicit beliefs about the "malleability of the personal attributes that define the type of person that someone is, as well as how he or she behaves" (Heslin et al., 2005, p. 842). Much of the early research focuses on how an individual's mindset influences their behavior (see Burnette et al., 2013). However, as Murphy and Dweck (2016) recently argued, a manager's mindset captures her beliefs about her ability and that of her employees to learn and grow and is likely to influence her actions and behaviors, including when interacting with others.

While relatively little research studying mindset at the organizational level exists, we use prior research based on implicit theories to predict that a manager's mindset influences two major categories of resource management practices: 1) financial management practices which include budgeting and revenue practices, and 2) human resource management practices, which include employee selection and the use of rewards[10]. Burnette et al.'s (2013) synthesis of prior research studying implicit theories is useful in developing our predictions. They develop a framework that links Carver and Scheier's (1998) self-control theory with implicit theories of behavior. This framework provides predictions about the relation between an individual's implicit beliefs about the growth versus fixed nature of human attributes and self-regulatory processes associated with goal setting, goal operating, and goal monitoring. While this meta-analysis of implicit theories is at the individual level of analysis, it provides us with intuition as to how managers with a growth mindset will differ in their use of financial and human resource management practices both in

[9] We do not hypothesize that one mindset is better than the other. That is, we do not hypothesize that one configuration of mindset and resource management practices is associated with superior performance. Contingency theory argues for equifinality in many circumstances; that is, that different management approaches and configurations of management controls may produce equivalent outcomes. Regardless, it is nearly impossible outside of an experimental setting to disentangle causation in the contingency relation. Thus we focus on the correlation between managerial traits and resource management practices that follow from managerial choices.

[10] There is no reason to expect that a manager would tailor their resource management practices to suit the individual characteristics of the employees as there is considerable heterogeneity in the employees of any organization given the manager has not necessarily appointed all of the employees. Similar to other research in management accounting, we hypothesize that mindset and context are the primary determinants of resource management practices. It is possible that the development of an 'organization' mindset can occur (Canning et al., 2020) but there is no study of which we are aware that indicates that the choice or use of management control will influence the organization's mindset.

terms of their own actions but also their interactions with their employees. We also draw on support from management scholars who have demonstrated that Dweck's concept of mindset influences how senior executives manage their employees and hence impact their employees' behavior (Heslin, VandeWalle, & Latham, 2005, 2006; Keating & Heslin, 2015).

Consistent with the management accounting literature, we investigate resource management practices (i.e., budgeting, revenue raising, rewards and selection) practices as a package of potentially inter-related practices (Grabner & Moers, 2013). The investigation of management practices as a package is recommended to prevent model misspecification and erroneous conclusions (Fisher, 1998; Chenhall, 2003). This is particularly important since financial and human resource management practices are likely to be related. For example, more prudent financial management and greater fundraising success allow schools to undertake a more robust hiring process and reward teachers who perform above expectations. Conversely, better quality and more motivated teachers are likely to lead to higher student enrollment and hence larger financial resources and more opportunities for fund raising. On the other hand, rewards and selection practices may act as both complements and substitutes (Campbell, 2012; Abernethy et. al. 2015). There is no way *a priori* to define what should be included in a package of practices. However, the investigation of a comparable package of practices is evident in prior studies. For example, Bedford et. al. (2013) investigate the effectiveness of a package of controls that include budgets, performance-based rewards, and employee selection and training under different strategic contexts and find that many of these practices are interdependent. Similarly, Sandelin (2008) investigates the use of a package that include budgets, recruitment and reward practices in a growth firm and also find close linkages between these practices. We selected practices that reflect the prior literature and are relevant to our research setting; specifically, field interviews indicated unique practices in education as well as variation in their use.

We discuss each of the resource management practices in turn and use available theory to hypothesize the direction of association between the strength of the growth mindset orientation (versus a fixed mindset) and the use of these practices. We spend considerable time understanding the relation with

budgeting behavior because of its importance in our setting but also its widespread use across many different organizations.

2.1 Mindset and Financial Management Practices

2.1.1 Budgeting Behavior

Budgeting is a management practice that exists in most organizations. Prior literature documents that budgets can play multiple roles in organizations such as planning, coordination, performance evaluation, resource allocation, and organizational learning (Covaleski, Evans, Luft, & Shields, 2003; Hansen & Van der Stede, 2004). A significant body of research examines both the determinants of budget behavior and the outcomes of budgeting behavior (see review by Luft & Shields, 2003; Herschung, Mahlendorf, & Weber, 2018). We focus on the learning dimension of budgeting behavior because this dimension links well with the differences in the self-regulatory processes identified by organization psychologists studying implicit theories of behavior. We first review the relevant literature on learning and then develop hypotheses relating mindset to budgeting behavior.

2.1.2 Prior literature on budgeting as a learning mechanism

Budgets are a means for managers to promote organizational-wide learning and to help them be more adaptable to changes in their organization's operating environment. This can happen through both the budgeting process (Simons, 1990; Ahrens & Chapman, 2004; Haka & Krishnan, 2005; Adler & Borys, 1996) and from the post hoc evaluation of budgetary outcomes (Argyris, 1977; Mock, 1973; Simons, 1991). Organizational learning comprises four linked constructs (see Huber, 1991 for a review). The first construct, knowledge acquisition, is how knowledge is obtained through various processes, including experience (also called 'experiential learning'). The second construct, information distribution, relates to the way information from different sources within the organization is shared. Information distribution determines the occurrence and breadth of organizational learning. The third construct, information interpretation, is the process by which meaning is ascribed to the information that is distributed. Huber (1991) argues that more learning occurs when there are more varied interpretations, as this increases the range of behaviors that the

organization could potentially undertake. Finally, organizational memory relates to how knowledge is codified for future recall and use.

In the context of budgeting behavior, the Burchell et al. (1980) typology describes four different ways information can be used, some of which reflect the notion of organization learning described by Huber (1991). One of the distinctions they make is between the use of accounting information as simply an answer machine and its use as a learning machine. A variance between budgeted and actual performance can be a source of knowledge obtained via experiential learning. To acquire knowledge from budget variances (or any issue an organization faces, more generally), the organization needs to gather information about the issue, organize this information, share it with employees, and involve employees in choosing, planning, and implementing actions to rectify the problem in the next budget cycle (Argyris, 1983; Trist, 1983; Peters & Robinson, 1984). Having discussions with key constituents about these variances helps ensure that knowledge is acquired from these variances. Discussions with the key constituents of the budget would also increase the distribution of information related to these variances, leading to further organization learning. In addition, explanations on why the variances occurred and the actions taken offer an interpretation of the underlying cause(s) of the variances and preferred solution when a similar situation arises. These uses of budgetary information to promote organizational learning are consistent with both Burchell et al. (1980) and the Simons' levers of control typology (1995). Simons and those who use his typology emphasize how interactive use of budget and other types of management control information encourages learning (Bisbe & Otley, 2004; Henri, 2006).

Budgets can disseminate information to various parts of the organization through the planning process (Abernethy & Brownell, 1999; Daley, Jiambalvo, Sundem, & Kondo, 1985; Bhimani et al., 2015), which is an essential component of organizational learning (Huber, 1991). Interestingly Daley et al. (1985) find variation in the extent to which managers use budgets as a communication tool, which accords with our expectations.[11] Related to the budget's role as a communication tool is the ability to use it to shape the

[11] Daley et al. (1985) argue that managers who conduct performance evaluations less frequently are more likely to use budgets as a communication device.

organization's culture (Hall, 1959; Pacanowsky & O'Donnell-Trujillo, 1982; Cushman, 1977). Culture is the set of values, beliefs, and social norms shared by members, which influence their thoughts and actions (Flamholtz, 1983). A strong organizational culture helps ensure that the knowledge gained by the organization is retained in memory for future use (Huber, 1991).

Finally, budgets can also enable managers to be more adaptable to the organization's changing operating environment and/or their specific local conditions. Ahrens and Chapman (2004) provide examples of these in their study of the management control practices of a restaurant chain. Managers would be able to take the information used in constructing budgets (e.g., standards) to determine the cost implications if they decide to vary certain process parameters. In addition, with the ability to customize performance reports, different managers would be able to utilize the same performance information to build highly varied mental maps of the organization that are most relevant to them. It is also worth noting that Ahrens and Chapman (2004) find variability in the extent to which different managers learned these (and other) management skills throughout their careers. Similarly, Simons (1990) characterizes budgeting systems in some organizations as involving frequent formal revisions and where budget meetings are used as forums to discuss tactics, new marketing ideas, and product development plans. Haka and Krishnan (2005) find that in highly uncertain environments, rolling budgets lead to better decisions as such a practice enables greater learning about the environment.

Before linking mindset to budgeting behavior, we summarize budgeting behavior into two constructs based on early research, namely the 'explaining' dimension and the 'enabling' dimension. We develop our constructs based on the original Swieringa and Moncur (1975)[12] study and subsequent studies. We note that researchers use different terms and measures for budgeting behavior depending on the conceptual model to be tested. We provide a summary of this literature in order to link our study to the measures used by others (see Appendix 1). The explaining dimension includes how managers use budgeting information relating to budget variances; the 'enabling' dimension captures some of the 'informal' uses of

[12] Swieringa and Moncur based their work on Fertakis (1967) who hypothesized that the behavior of supervisors was related to the amount of budget-related pressure they perceived that they were subject to.

budgets as discussed above that would allow a manager to become more adaptable to the changing environment and shape the culture by communicating and reinforcing the priorities of the organization.

2.1.3 Hypothesis 1 – mindset and budgeting behavior

The organization psychology literature demonstrates the self-regulatory and interpersonal implications of mindset (Keating & Heslin 2015; Burnett et al., 2013). Burnette et al.'s (2013) self-regulatory framework is particularly useful in explaining why we would observe differences in budgeting behavior. Their three self-regulatory processes differ to the extent that an individual focuses on growth and learning in goal setting, goal operating strategies, and goal monitoring strategies. These three self-regulatory processes serve as the mechanism to explain the relation between mindset and goal achievement. Budgets also involve the same three processes, setting budget targets, implementing strategies to achieve those targets, and monitoring the variances that occur. We expect differences in how managers use budgets and budget information for 'explaining' and for 'enabling'.

In relation to the 'explaining' dimension of budget behavior, the Burnette et al. (2013) meta-analysis provides evidence that mindset influences how individuals respond to feedback information. Because GMS managers are more likely to view budget targets as learning goals, they will pay attention to feedback information and perceive setbacks as demonstrating a need for more effort and/or different strategies or actions to improve. We expect that a GMS manager will treat budgets and budget variances as a learning opportunity and will invest more time in discussing and explaining the reasons for these variances and then explaining the actions taken in response. We do not expect FMS managers to do so to the same extent. An individual with a FMS will view budget targets as performance goals, will focus on achieving the goal/target, and will have negative emotions (i.e., anxiety) and engage in 'hopelessness' strategies (i.e., defensive behavior) when evaluating progress on that goal. They focus on achieving the goal as the end state rather than using the information to learn. Thus, we expect that GMS managers will be more likely to use the budget in an 'explaining' manner than FMS managers.

We also expect that a GMS manager's focus on learning goals and mastery-oriented strategies, rather than performance goals and helpless-orientated strategies as described by Burnette et al. (2013), will

increase the extent to which they view budgets as an 'enabler' for them to become better managers. Adler and Borys (1996) conceptualize enabling bureaucracies as those that allow employees to master their tasks, deal with contingencies, and regain control. This is consistent with prior research that finds that budgets may be used by managers to enable themselves to become more adaptable to changes in their operating environment, to better communicate their goals and priorities, and to potentially commit an organization's learnings to memory through the shaping of its culture.[13] In addition, it is likely that a GMS manager would likely see more value in using budgets as an enabler compared to an FMS manager because the former believes in the ability of her employees to learn and change who they are as a person. We argue that the between-manager variation in the use of budgets for these purposes (e.g., Daley et al., 1985; Ahrens & Chapman, 2004) can be partially explained by differences in mindsets. In sum, we hypothesize that:

H1: Managers with a growth mindset are more likely than those with a fixed mindset to use budgeting: (1) for explaining past results, and (2) as an enabler in their managerial role

2.1.4 Revenue Raising Practices

Researchers in the government and not-for-profit sectors use resource dependency theory to explain the importance that these sectors attach to acquiring and maintaining resources. These sectors are not autonomous and cannot easily exploit market opportunities. Resource dependency theory asserts that the "key to organizational survival is the ability to acquire and maintain resources" (Pfeffer & Salancik, 1978, p. 2). Organizations in the government sector are threatened due to differing political perspectives on the level of public funding that should be provided for services such as education and health. Schools are particularly vulnerable and thus, to maintain their funding source, it is rational for them to seek additional sources of revenue (Froelich, 1999). However, those adopting the resource dependency perspective are concerned that there may be adverse consequences when organizations become beholden to non-traditional sources of revenue (e.g., large donations, or major fundraising activities). They also fear that non-traditional

[13] As far as we are aware there is not empirical research directly linking budgets with organizational culture; however, links have been established between budgets and communication goals (Abernethy & Brownell, 1999; Daley et al., 1985; Bhimani et al., 2015) and between communication and organizational culture (Hall, 1959; Pacanowsky & O'Donnell-Trujillo, 1982; Cushman, 1977).

sources of revenue will shift attention away from the organization's mission. We do not explore the consequences of seeking alternative revenue sources. Rather, we focus on why some principals devote significant time and energy to revenue-raising while others do not.

A challenge for government-funded schools is maintaining the schools' revenue base. By far, the largest proportion of revenue comes from the government. The funding formula is based on the number of students enrolled and socio-economic factors associated with the school population. Principals can actively grow revenue by competing for additional students and/or by fundraising externally from the community, the private sector, and special project grants. In the interview phase of our study, we found differences in principals' attitudes to revenue diversification. Fundraising is not a typical or required activity for school principals. Nor are they trained in effective fundraising practices. Nonetheless, we found that some principals are quite entrepreneurial in seeking additional resources through different sources of funding, while other principals think that funding should come exclusively from the government.

2.1.5 Hypothesis 2 - mindset and revenue raising

In keeping with the definitions of GMS and FMS, we predict that GMS principals will engage in entrepreneurial efforts to seek philanthropic support and/or project funding grants because they see the opportunities that these efforts provide for growing and developing the school. It takes a certain type of principal to actively seek to diversify; these will be individuals who are willing to exploit opportunities, using both public and private resources, to create value for their constituents. Ramamurti (1986, p. 143) labels these types of individuals 'public entrepreneurs', that is, they are "individuals who undertake purposeful activity to initiate, maintain or aggrandize one or more public sector organizations." We expect principals with a GMS to be more likely to do so. Entrepreneurial activity is challenging, and entrepreneurship is not something that is core to the education and training of school principals. However, people with a GMS "enjoy challenges, strive to learn and seek potential to develop new skills" (Dweck, 2014b, p. 28). Those with a FMS may not be willing to pursue innovative-type activities as they worry too much about failing. In a GMS culture, growing and developing the organization is key, and the opportunities

to do so are seen as challenging and exciting (Murphy & Dweck, 2016). It is consistent with Burnette et al.'s (2013) argument that those who adopt a 'mastery-oriented' instead of 'helplessness oriented' (i.e., growth vs. fixed mindset) strategies will not see themselves as constrained by current funding; they will take more control of the situation and respond by investing time and effort in fundraising activities. We expect that principals with a GMS are more likely to solve resource constraints through their own direct actions, that is, through their fundraising efforts. In sum, we expect that the principal's mindset will be an important determinate of her efforts to seek additional resources:

H2: Managers with a growth mindset are more likely than those with a fixed mindset to engage in fundraising

2.2 Mindset and Human Resource Management Practices

2.2.1 Selection

Selection is important for controlling the behavior of employees when individuals are expected to perform multiple tasks, some of which may not be equally well-measured. Prior research identifies variations in selection practices and views them as a deliberate control choice of managers (e.g., Abernethy, Dekker, & Schulz, 2015; Campbell, 2012). Roberts (2004, p. 164) argues "whom a firm attracts and selects as employees can have a tremendous effect on their motivation". Selecting the 'right people' also reduces the potential for agency problems to emerge.

We expect selection practices to be particularly important in a school setting as it is difficult to align the interest of teachers with the school through the use of formal contracts given the idiosyncratic, craft of teaching. Empirical studies regularly document that significant "teacher effects" explain significant variation in student performance outcomes; however, studies that have sought to explain the source of these effects (e.g., teacher education, tenure, subject-matter expertise) have been largely disappointing. Contracting on educational outcomes (e.g., student performance or student growth in SAT scores) is problematic because it is challenging to accurately attribute the contribution of a teacher (as opposed to other teachers or the student's parents) to outcomes (Evans, 2001; Solomon, & Podgursky, 2001).

2.2.2 Hypothesis 3 - mindset and selection practices

To develop our hypothesis on selection practices, we rely on prior research that investigates the relationship between mindsets and lay dispositionism (e.g., Chiu et al., 1997; Erdley & Dweck, 1993; see Dweck, Hong, & Chiu, 1993 for a review). Lay dispositionism refers to the tendency to make inferences about another person, based on that person's personality traits and other dispositions (e.g., intelligence) (Ross & Nisbett, 1991). Differences in principals' mindset are expected to result in differences in the way they evaluate others, i.e. their lay dispositional tendencies. FMS principals believe that "who people are" is fixed and therefore, would see the evaluation of an individual as an assessment of their fixed underlying traits. Historical information would be informative for FMS principals in judging the current qualities of the individual. On the other hand, because GMS principals believe that an individual's qualities are more malleable and can change over time and across contexts, they would need to understand the dynamics of the individual's qualities when evaluating others. These arguments have been used to explain the findings in Chiu et al. (1997) and Erdley and Dweck (1993). Chiu et al. (1997) show that FMS individuals are more likely to make inferences that trait-related outcomes will be consistent across different situations (e.g., academic performance and performance in basketball would be positively correlated). They also find that given the same amount of information, FMS individuals are more confident in making predictions about a person's behavior, and in drawing conclusions about their traits. Taken together, these findings indicate that FMS principals are more likely than GMS principals to subscribe to lay dispositionism.

While the much of the research linking mindsets with lay dispositionism has been undertaken using experiments with student subjects in more general settings[14], Heslin et al. (2005) have argued that the link between mindset and how individuals evaluate others can impact a manager's actions with respect to their employees (i.e., performance evaluations). Similarly, we expect the mindset of principals would impact how they evaluate job applicants and hence how they use selection practices. Specifically, a FMS

[14] An example of a question in Chiu et. al. (1997, p. 23) that measures lay dispostionism: "Suppose you observed Jack and Joe in one particular situation and found that Jack was more friendly than Joe. What do you suppose is the probability that in a completely different situation, you would also find Jack to be more friendly than Joe?"

principal's willingness to ascribe performance information from one domain to another would mean that they would be more likely than GMS principals to rely on academic (GMAT, quality of the educational institution) and other past achievements in different areas to predict a candidate's performance in the classroom. This type of information is generally more readily available and verifiable, thus reducing the need for an extensive selection process. In addition, a FMS principal's lower input requirements before making predictions about an individual's future behaviors and traits should also result in a less extensive selection process than what a GMS principal would undertake. We summarize our expectations about selection practices as follows:

H3: Managers with a growth mindset are more likely than those with a fixed mindset to employ a more extensive and varied set of inputs in employment selection decisions.

2.2.3 Rewarding Performance

Selection processes alone are often insufficient to provide direction to employees. Incentive contracts help employees prioritize their actions (Abernethy, Dekker, & Schulz, 2015). Much has been written about incentive contracts; what determines the type of contract and the consequences of different types of contracts. The empirical literature can be segmented into several categories. Similar to the budgeting behavior literature, there are both determinants and consequences of rewarding individual performance (see reviews by Abernethy & Mundy, 2014; Bonner & Sprinkle, 2002; Herchung et al., 2018). The early research focused on financial measures and the adverse consequences that occurred. This started with the Hopwood (1976) and Otley (1978) studies that arrived at different conclusions when managers emphasized financial performance. What becomes known as 'contingency literature' provided a host of factors that influenced when adverse outcomes would occur and when they would not occur.

Kaplan and Norton's balanced scorecard (Kaplan & Norton, 1992) challenged the way we design and use performance measures to reward performance. They suggested that we need to incorporate a much more comprehensive set of measures for rewarding performance and researchers began to demonstrate when non-financial measures might work best (e.g., Ittner, Larcker, & Rajan, 1997). Prior literature primarily examined differences in financial and non-financial measures for measuring performance and

generally did not distinguish the type of rewards that were made based on performance. We are interested firstly in the extent to which managers use rewards and secondly whether there are differences in the use of financial rewards (e.g., bonuses, accelerated increments) and the use of non-financial rewards (e.g., professional development opportunities, verbal recognition, written recognition in newsletters, tokens of appreciation). While financial rewards are common, we are beginning to see much greater use of non-financial rewards.[15]

2.2.4 Is there a relation between mindset and reward practices?

There is considerable evidence that individual characteristics of managers influence the incentive contract choice, but much of this research relates to the choices that a firm makes when rewarding the CEO (Abernethy & Wallis, 2019). There is much less research on how managerial traits influence performance measures and incentives at lower levels within the firm. Based on Dweck and her colleagues' theoretical and empirical findings, we expect GMS principals to emphasize learning and recognize the importance of related actions such as "seeking help from others, trying new strategies, and capitalizing on setbacks to move forward effectively" (Dweck, 2016). These characteristics of GMS are also reflected in Burnette et al.'s (2013) framework in which they are described to have a preference for learning-oriented goals and mastery-oriented strategies. We argue that given these preferences and the fact GMS managers are held accountable for their employees, they are also likely to set learning goals for their employees. Thus, GMS would use rewards to motivate employees to achieve these learning goals and encourage actions that would lead to learning. On the other hand, FMS managers will set performance goals for their employees as they believe than an individual's ability is relatively fixed by initial talent endowments; they would use rewards to recognize high levels of performance in order to motivate employees to maximize effort. In other words, it is possible that GMS and FMS managers both use rewards extensively but for different reasons. We did

[15] A survey conducted by Dewhurst, Guthridge, & Mohr, et al. (2009) of more than 1000 executives globally found that 63% were subject to non-financial rewards.

not attempt to capture the reasons for the use of rewards given the sensitivity of their use in this sector.[16] However, we do assess the relation between mindset and use of rewards in an attempt to answer the following research question:

RQ1: Does mindset influence the use of (1) financial rewards and (2) non-financial rewards?

3. RESEARCH METHODS

3.1 Research Setting

Interviews with staff at the Department of Education and Training (DET) informed our understanding of the research setting and principals' responsibilities related to resource management. We learned from DET that school principals have the responsibility to evaluate the performance of their teachers and the discretion to the reward high performing teachers with a financial or non-financial reward. They also have autonomy in teacher hiring decisions. The School Council (consisting of parents, the principal, and teachers) is responsible for the financial management of the school. When it comes to preparing and using the annual budget, principals take the lead, aided by the DET's administrative and finance IT system. The budget is submitted for approval by the School Council. The DET recommends that principals report significant variances to the School Council; however, the principal decides how the budget is used within the school and also how the information is communicated to teachers within the school and to the School Council.

Based on the above summary of resource management responsibilities, we first completed exploratory interviews with principals from a diverse set of schools and then administered a mail survey to approximately half of all school principals in the state.[17]

[16] There is a general resistance from teacher unions and many teachers to be subjected to performance-based financial rewards in both Australia as well as countries such as the UK and US (Australian Education Union, n.d.; The National Union of Teachers UK, n.d.; Goldhaber, 2006).

[17] The other half of the population of principals received a second research survey on a different research question. Before administering the surveys, we compared the demographics (size, location, school type) and student learning outcomes to ensure random assignment to the two groups. There were no differences between the two groups. We intentionally included a small number of common questions in both surveys to evaluate selection bias in survey completion.

3.2 Field Interviews

We conducted interviews with principals from 12 representative schools to understand their perspectives on resource management practices, which in turn informed survey development and suggested important control variables for the analysis. DET identified the principals to be interviewed, including representatives from different school types (primary and secondary), locations (urban and suburban), and sizes and with varying student socio-economic backgrounds. The semi-structured interviews lasted for about an hour each and covered the school's organizational structure, how principals spend their time, the issues that they face when managing resources, and the resource management practices that they employ.[18] Generally, two researchers conducted the interviews. All interviews were taped and transcribed.

While we did not ask principals questions to assess their mindset directly, many of their responses to questions about resource management aligned with our hypothesis that mindset influences resource management practices. For example, a principal who we later learned was on the FMS end of the mindset scale mentioned how she had delegated the leadership of professional development activities for teachers to an assistant principal.[19] When asked what is important, her responses include "We have about 95 - 98% of our children achieving at or beyond the expected standard so our targets would be that we stay up there." Based on this response, we infer that she defined strong performance by school test scores as opposed to growth or improvement in performance, consistent with a FMS orientation. On the other hand, a principal who we later found to be on the GMS end of the mindset scale described extensively how she goes about securing funding from external sources. For example, "… I also do a lot of funding like when we had the PIC (Photo Imaging Centre) move here. Just to give you an example, when PIC moved here, the Department was going to give us a loan but I also raised $170,000 from a benefactor who's been helping us over the

[18] The interviews also indicated that the principals felt they had autonomy over their school's resource management practices. For example, when discussing the school's financial resources: "So once I've done my literacy and numeracy, I look at my next priority and determine what is the next thing that needs to occur. And probably the facilities and the works around the school is my last priority"; when discussing how to find good teachers: "Advertising and when you advertise being really careful, I mean I've had no appointments ... if I don't think a person is right for the job I won't appoint them so I've had no appointments".

[19] Surveys included identifying information about the school to allow us to match the survey data to demographic data. Thus, after the survey was completed, it was possible to assess the mindset of the 12 principals we interviewed in the exploratory stage of the research.

years who heard me on radio…" and "So part of my job at the time is to actually look and see what opportunities there are to bring in so over the years I've brought in you know from all sorts of avenues, millions, millions…"

In summary, although we intentionally did not directly assess mindset, the field interviews highlighted strong themes about how principals approach resource management differently. Even among schools that are similar on a key dimension, there was significant anecdotal evidence that a "principal effect" was at play in the observed variation in resource management approaches. Thus, based on what we learned, we received approval from DET to move ahead with a large-scale survey of principal mindset and resource management practices.

3.3 Data Sources and Survey Administration

We use data from several sources, including a survey that we administered, surveys administered by the DET, and school-level student test data. Variables that we measure in a mail survey include principals' mindset as well as attitudes toward and use of different resource management practices. The DET provided us with the names and contact details for principals of all primary and secondary schools in the State (N = 1498). For this study, we targeted a random selection of 749 schools, including primary and secondary schools located in the major metropolitan city in the state, as well as in outlying regions. DET also provided data on school demographics and aggregate student learning outcomes as well as data from DET surveys of teachers.

The survey was pre-tested in two stages: first with academics to test the face validity of the measures, and later with three principals to ensure that the questions were clear and that the online survey tool functioned properly. After finalizing the survey, we made additional modifications based on feedback from DET. Of the 749 principals who received an email invitation to participate, 433 visited the online survey site and started the survey, and 275 substantially completed the survey. Of those that completed the survey, 18 are removed because the school is a designated special school (serving an atypical population such as students with mild, moderate and profound intellectual disabilities, for deaf and hearing-impaired

students).[20] Thus, the final research sample includes survey responses from 257 principals. In latter stages of the analysis, when the survey data are matched to school outcomes on student test performance, 24 observations are lost due to missing test data.

In untabulated analysis, we test for survey response bias by i) comparing schools in the research sample with those that did not choose to participate in the survey; and, ii) by comparing schools and limited survey data for the research sample and survey respondents who were eliminated due to substantially incomplete surveys. Of the 316 principals who received an invitation to complete the survey but did not accept, 14 teach in special schools and would have been removed from the sample had they completed the survey. Comparing data about the schools of the remaining 302 non-participants against the research sample, we find no significant differences in school size, student demographics, teacher assessments of school climate or leadership, or student test outcomes. Comparing the research sample with the 176 partially completed surveys, there are no significant differences in school characteristics or performance outcomes and no significant differences in the average responses to the first three survey questions among those who completed these questions. For 18 principals in the incomplete sample (10%) who answered questions at the end of the survey on employment history, there is no evidence of differences in work experience. However, those who did not complete the survey appear to have higher educational attainment than those that did (94 versus 53 percent with master's degree). Overall, we find no evidence of response bias when comparing the research sample to either non-responders or participants who did not substantially complete the survey.[21]

3.4 Variable Measures

[20] In an untabulated robustness test, we include the 18 special schools and the results are qualitatively unchanged.

[21] Although the second survey (described in footnote 13) experienced a slightly higher response rate, we also find no meaningful differences in school size, student demographics, or school-level student test outcomes between the research samples of the two studies. Of course, this is a joint test of response bias in both surveys, but coupled with the similarities of the surveyed samples and the within-study similarities of respondents and non-respondents for this study, it adds to the evidence of random participation choice among our respondents.

Table 1 presents descriptive statistics for the variable measures that we describe below. Although we have substantially complete survey data for 257 principals, listwise deletion of observations with incomplete data on the control variables reduces the sample to 238 observations.[22] For survey items that are the basis for measuring multi-item latent variables (labeled *GMS, EXPLAIN, ENABLE* in Table 1), the measurement scale, the mean and standard deviation of the items are presented, along with measures of scale reliability (i.e., Cronbach's alpha and composite reliability). Analysis of scale reliability for the multi-item measures indicates that Cronbach's alpha is reduced significantly if any item is deleted from the scale. Thus, the scales are a parsimonious representation of the construct. For variables that are measured with a single survey item (labeled *FUND, NFR, FR)* or an aggregation of several formative items (*HIRE)*, Table 1 presents the mean and standard deviation for each. Recognizing that these items are an imperfect reflection of the corresponding latent variable (Hayduk & Littvay, 2012), we use a 0.85 reliability factor consistent with Jöreskog & Sörbom (1993).[23]

3.4.1 Independent Variable: Growth Mindset

The survey includes the eight-item scale established in prior work to measure mindset (Levy & Dweck, 1997). Four items in the scale are positively associated with having a growth mindset, and four are positively associated with having a fixed mindset (i.e., reverse coded in relation to growth mindset). Although confirmatory factor analysis indicates that the eight-item scale fits well with high loadings of all items, for parsimony in modeling we use the four positively worded items to measure mindset, with high values denoting a growth mindset and low values denoting a fixed mindset. Negatively worded survey questions are often found to be imperfectly correlated with their positive counterparts (Weijters & Baumgartner, 2012; Marsh, 1996). Analysis of scale reliability supports our use of the 4-item scale. The four positively worded items have a Cronbach alpha and a composite reliability of 0.90 that is not improved

[22] Subsequent exploration of the moderating effect of performance on the hypothesized model further reduces the sample to 233 observations with complete performance (i.e., student test outcomes) data.

[23] In the structural equations model, we fix the error variance for these variables by multiplying their respective variances by 0.15. The measurement errors for multi-item latent variables (*GMS*, *EXPLAIN*, and *ENABLE*) are estimated within the model, which simultaneously fits the measurement models and the structural model.

with the removal of any of the items and is improved only by a negligible amount if any single reverse-coded item is included. Thus, a parsimonious selection of 4-items for the GMS scale, which is consistent with how prior researchers have used the scale (Chiu, Hong, & Dweck, 1997; Levy, Stroessner, & Dweck, 1998; Hong et al., 2003) is appropriate for our sample size and research focus on resource management.

Levy and Dweck (1997) measure mindset as a set of deeply held beliefs about the capacity of people to learn and change that are invariant to work context. As a validity check on *GMS*, we included two additional sets of survey items placed near the end of the survey to determine whether respondents' mindset is consistent with responses to questions about how teachers influence teaching outcomes and to determine whether the general mindset disposition is associated with beliefs about the immutability of intelligence. These questions reflect a tailoring of the mindset instrument to the specific job of principals and are similar to the approach of Leslie, Cimpian, Meyer and Freeland's study (2015) of mindsets in academia, and of Canning et. al. (2020) study of Fortune 1000 companies.

Considering first the association between mindset and beliefs about teaching, the statement "being an effective teacher requires a special aptitude that just can't be taught", which reflects a fixed mindset, is negatively correlated with *GMS* ($r = -0.30$, $p < 0.00$[24]). Similarly, a growth mindset statement: "With the right amount of effort and dedication, anyone can become an effective teacher", is positively correlated with *GMS* ($r = 0.24$, $p < 0.00$). We conclude that the principals' mindset, as measured by *GMS*, is internally consistent with their beliefs about teachers' innate versus learned capabilities. However, modest correlation levels indicate that the way that a growth mindset manifests in the workforce may be somewhat situational.

Next, we test the relation between the factor score of the immutability of intelligence construct (e.g., "People can learn new things, but you can't really change their basic intelligence", "People have a certain amount of intelligence and you really can't do much to change it", "People can learn new things, but you can't really change their basic intelligence"). Demonstrating the internal validity of *GMS*, we again

[24] We use one-tailed tests of correlation for construct validity tests because they are directional tests of expected associations.

find a negative relation between the two constructs (r = -0.40, $p < 0.00$). Principals with a growth mindset as measured by *GMS* are less likely to view intelligence as immutable.

3.4.2 Dependent Variables: Financial Management Practices

Budget use. Our budget variables are based on a modified instrument developed originally by Swieringa and Moncur (1975) to study budgeting behavior. Their measurement instrument has been modified and used repeatedly in the literature to capture different dimensions of budgeting behavior. We focus on the dimensions that are most closely related to learning and growth and modify the questions in recognition of the fact that the respondents of the surveys are school principals. We also include an item in our instrument to capture what Hansen and Van der Stede (2004) refer to as the "strategic and long-term use of budgeting" because principals, along with their school council, are responsible for a school's strategic plans (DET, 2020). Based on the exploratory field interviews where several principals mentioned that developing norms and values of the teaching staff consistent with those of the school was important (e.g., the use of external coaches, off-site team-building activities), we added one item that captured whether the principal uses budgets to shape the culture of the school.

Considering first the use of budgets to learn from the evaluation of budgetary outcomes, we use three survey items to measure the variable, *EXPLAIN*. These items relate to the extent to which principals engage in discussions with key constituencies to explain budget variances and any corrective actions taken. These discussions could include regular interactions with the teachers within the school if changes in expenditure are required and also a reporting to the School Council when there are major changes in the budget. The School Council includes teachers, parents and members of the school community. This construct has been widely used in prior budgeting research, e.g. Merchant (1984), Ezzamel (1990) and Williams, Macintosh and Moore (1990). For these items, a Cronbach's alpha of 0.76 and a composite reliability of 0.79 demonstrate good scale reliability. As internal validity checks on *EXPLAIN*, we assess whether the construct exhibits predictable associations with other data collected in our questionnaire. Clearly, principals will not be able to use budgets in the manner described if there are system limitations that preclude such analysis. Thus, we ask whether there is a formal system that flags significant variances

between the budget targets and actual spending. We predict and find a significant positive association between responding in the affirmative to this question and *EXPLAIN* (r = 0.23, $p < 0.00$). A second question asks the frequency (seven-point scale from "never" to "very frequently") with which budget targets are changed during the year as a result of variances between planned and realized activity and as expected it is positively correlated with our *EXPLAIN* measure (r = 0.17, $p < 0.00$). Finally, one survey question asks principals to read two brief descriptions of how they view budgeting activities (see Appendix 2). The first describes a comparatively routine, bureaucratic process that is led by a school business manager.[25] The second is a more strategic, consultative process led by the school principal. Thirty-five percent of respondents selected the first choice and 65 percent selected the second choice. Our objective of presenting the descriptions in neutral, non-judgmental ways so as not to stimulate affirmation bias appears to have been achieved. We expect those who use budgets to engage in discussions concerning budget variances (*EXPLAIN*) to be more likely to select the second description, and this is what we find (r = 0.35, $p < 0.00$).

Internal validity speaks to the consistency with which the survey respondent answered questions. External validity speaks to the consistency with which other observers asked to comment on the same phenomena would respond similarly. As an external validity check on *EXPLAIN*, we compare the principals' self-reported use of budgets to monitor and discuss current performance, with data from a DET-administered survey of teachers. Teachers were asked to evaluate their school's climate using a four-item scale for "collective focus on learning" and a four-item scale for "curriculum efficacy", each comprised of items related to the degree to which the school has discrete learning goals and monitors performance to these goals. We were given school-level data on the average of teachers' summed responses to the two four-item scales, but not the item-level data. We find a positive correlation between *EXPLAIN* and the "collective focus on learning" (r = 0.12, $p < 0.05$) and with "curriculum efficacy" (r = 0.18, $p < 0.00$). In sum, when related concepts are evaluated with a different measurement instrument by different respondents, the associations, though weak, are statistically significant and in the direction predicted.

[25] Most schools in our sample have an administrative person who is often termed business manager.

To capture the ability of budgets to be used as an enabling tool, we rely on Adler and Borys' (1996) arguments that the formalization of an organization's workflow, which includes its management control systems, can be a mechanism to empower and enable managers. Enabling bureaucracies allow employees to master their tasks, deal with contingencies and regain control. Coercive bureaucracies aim to force compliance and extract effort. While Adler and Borys do not explicitly discuss budgeting, it is reasonable to view the budgeting process as part of a principal's workflow and we use six budgeted-related survey items to capture this construct (labelled *ENABLE)*. These items, that are based on a modified version of the Swieringa and Moncur (1975) instrument, measure principals' use of budgets to be more flexible and innovative, to better plan, communicate strategic direction and shape culture. A similar but narrower construct that focuses on enabling change has been used in Williams et al. (1990) and Hoque and Hopper (1997). A Cronbach's alpha of 0.86 and composite reliability of 0.86 demonstrate good scale reliability.

As internal validity checks on *ENABLE,* we correlate *ENABLE* with survey items that should be associated with it. In one block of survey questions, we ask the principal to estimate the total hours spent by all involved personnel on the school's annual budget and then ask for the percentage of this time spent by the principal herself, the leadership team, and the administrative staff. We expect a principal who is using budgets as an enabling tool to spend more time overall on budgeting, and for that time to be concentrated with the principal and the senior leadership team rather than administrative staff. We do not find a significant correlation between *ENABLE* and the total hours spent on budgeting; however, we do find that the share of hours attributed to the senior leadership team is positively associated with *ENABLE* ($r = 0.14$, $p < 0.01$). Finally, returning to the two descriptions of budgeting activities described earlier (Appendix 2), we expect a positive correlation between *ENABLE* and the second paragraph description of budget use (i.e., the more strategic and consultative approach to budgeting) and this is the case ($r = 0.27$, $p < 0.00$).

Revenue raising practices. In consideration of the research setting, where fundraising can be a significant source of resources separate from government subsidies, and in light of interviews that highlighted different views among the principals about time spent on fundraising, we measure principals' engagement in fundraising with a single-item survey question, *FUND*. Table 1 indicates a high level of

fundraising engagement, but also meaningful variation. As an internal validity check on *FUND*, we compare the principals' reported engagement in fundraising with questions that are predicted to have a negative association. Government funds are supplied for each student enrolled, so in interviews, some principals reported that their time was better spent growing enrollments than seeking external funds. A survey question that asks for the level of agreement with the statement: "Increasing student numbers is my preferred strategy for obtaining additional resources", is significantly negatively correlated with *FUND* (r = -0.15, $p < 0.01$). Similarly, the statement: "The school doesn't spend much time applying for government grants to fund new initiatives", is also significantly negatively correlated with *FUND* (r = -0.40, $p < 0.00$).

As an external validity check on *FUND*, we compare the principals' self-reported engagement with fundraising with data from a DET-administered survey of teachers in which teachers were asked to evaluate their school's leadership using a six-item scale for "parent and community involvement, engagement, and outreach". We were given school-level data on the average teacher's response to the summed responses to the six-items, but not the item-level data. We expect a principal who engages in significant fundraising to be evaluated more positively by teachers on this measure and indeed, we observe a significant positive association (r = 0.15, $p < 0.01$).

3.4.3 Dependent Variables: Human Resource Management Practices

Selection. The first aspect of managing human resources that we consider relates to approaches to hiring teaching staff. Teacher salaries and benefits are the largest portion of school costs. Salaries and staffing levels are constrained by contractual agreements; however, principals have latitude in selecting from the eligible candidate pool when hiring. Hypothesis 3 posits that principals with a GMS will make greater use of varied inputs in the hiring decision; thus, we create the variable, *HIRE,* by averaging the extent to which respondents report using the following inputs in the selection process: interviews, personality tests, referrals from current staff members, classroom observation, student input, candidate presentations, and references that are provided by the candidate as well as those that are not. As Table 1 indicates, among the nine inputs, personality tests are the least commonly used input and in-person interviews are the most widely used input to hiring teachers.

Rewarding performance. The second aspect of managing human resources that we consider is principals' reported use of non-financial rewards (e.g., verbal recognition, tokens of appreciation) and financial rewards (e.g., accelerated advancement in rank) in the preceding period, labeled *NFR* and *FR* respectively. Employment contracts govern the pay scales of teachers. However, according to the DET guidelines at the time of this study, opportunities existed to provide financial rewards if there are adequate funds[26] , and the principal is inclined to do so. *NFR* and *FR* are measured with single items from the survey to measure the principal's actual history in using non-financial and financial rewards. Table 1 indicates that there is a much higher use of NFR than FR. Nonetheless, both *NFR* and *FR* have similar variations in the research sample (e.g., *FR* is not differentially censored), so we test RQ1 for both modes of reward.

As a validity check, we compare *NFR* and *FR* to the response to another survey item in which respondents were asked their level of agreement with the statement: "To the extent that policy permits it, I support using financial rewards to recognize high performing teachers". The response is positively correlated ($r = 0.45$, $p < 0.00$) with *FR* and uncorrelated with *NFR*. This survey item, which captures principals' attitude toward the appropriateness of financial rewards is not a part of the *FR* construct because *FR* is further constrained by whether funds are available for this use. Nonetheless, the positive correlation indicates that principals respond consistently within the survey.

The willingness to use individual-level rewards to recognize high performance presumes that principals are confident in their ability to identify deserving recipients. As a second validity check, we compare *NFR* and *FR* with agreement with the statement: "It is possible to measure the contribution teachers make to learning outcomes". This statement is positively correlated with both NFR and FR (0.09 with NFR and 0.08 with FR, both with $p < 0.10$), indicating the expected association; however, the weak level of correlation may indicate that principals trust their own judgments of teacher contributions but doubt the ability to "measure" these contributions.

[26] Only three schools in the sample have had deficit spending in the prior three years, so in principle, all schools could redeploy available resources for this purpose if there was sufficient desire to do so. That is, the *NFR* and *FR* variables are not censored as a result of policy.

3.4.4 School Performance

School performance is measured using data from the National Assessment Program (*NAPLAN*)'s standardized math and reading scores in 2015. Students are tested in Years 3, 5, 7, and 9, and we have access to the average score for each school for each grade. By design, the standardized test scores increase in grade level. To make schools that cover different grades comparable to one another, for each grade, we convert the *NAPLAN* score into a percentile (i.e., a school's 3rd graders may fall in the 55th percentile of all schools that teach third grade). Then, we compute a weighted average *NAPLAN* percentile score for each school by weighting the grade-level percentiles by the size of the grade-level cohort of students. This is done separately for math and reading *NAPLAN* results.

For the sample of schools with complete test score data (N = 233), the schools' percentile ranking on student test performance has a mean level of 0.50 and 0.51 for math and reading, respectively. These values (as well as unreported skewness and kurtosis statistics that indicate a normal distribution), at the midpoint of the 1-100 percentile rankings, suggest that the research sample is relatively free of selection bias associated with school performance.

NAPLAN provides an objective measure of student achievement that is validated by survey data. In the survey, principals rated their school relative to a DET-specified cohort of comparable schools on a variety of objective and subjective dimensions using a 13-increment scale, ranging from "30 percent worse" to "30 percent better". One dimension, "student test scores" is positively correlated with *NAPLAN* Reading (r = 0.52) and Math (r = 0.53) test scores, both with $p < 0.00$.[27]

3.4.5 Control Variables

[27] Relatedly, the DET teacher survey used to provide external validation of survey items also provides external validation of the principals' self-assessed performance. Specifically, the principals' assessment of teachers' satisfaction with the school (as compared with comparable schools) is correlated at r = 0.51 ($p < 0.00$) with the DET survey measure of "school climate" as assessed by teachers. Moreover, using another DET survey of students that measures average student morale within a school, we find that student morale is correlated at r = 0.19 ($p < 0.00$) with principals' assessment of the quality of the student learning experience, at r = 0.39 ($p < 0.00$) with principals' assessment of student satisfaction, and at r = 0.39 ($p < 0.00$) with principals' assessment of student engagement. In short, principals' self-assessment of performance accords well with independent subjective assessments of teachers and students, and with an objective assessment of student learning, thereby providing further evidence of the validity of our survey instrument.

Socio-economic factors explain a great deal of variation in students' learning outcomes (Hattie, 2009) and thus, are commonly included as control variables in education research aimed at identifying other factors that influence school or student performance. These variables are also relevant controls in the analysis of resource management practices. In the case of financial resources, schools with disadvantaged students are entitled to additional government funding but are also under increased scrutiny to demonstrate progress in student learning. In the case of human resources, schools with disadvantaged students may have greater difficulty attracting and retaining staff, and those who choose this challenging setting may have a different orientation towards financial and non-financial rewards than those who work in other schools.

We control for student socio-economic status by including the Index of Community Socio-Educational Advantage (*ICSEA*) for the school. *ICSEA* was created by the Australian Curriculum Assessment and Reporting Authority (ACARA) to enable more accurate comparisons between schools on the *NAPLAN* tests. The score takes into consideration parent education and occupation, the school's percentage of indigenous students, and its rural or city location.

We include a measure of school size (*LNSIZE*) to control for differences in resource management practices that may arise in managing organizations of different scales. Size is measured as the natural logarithm of the number of students enrolled in the school. A log transformation is needed to enhance the normality of the variable. We include an indicator of whether the school is a primary (*PRIMARY* = 1) or secondary school (*PRIMARY* = 0) because minimum acceptable staffing levels and associated financial resources are tied to grade-level requirements for class size and school-level requirements for per-pupil support staff. Primary schools cover kindergarten and grades 1-6 and secondary schools cover grades 7-12. Each type of school administers *NAPLAN* testing in two grade cohorts each year. Student enrollment in 2015 and school type is taken from the school profile database maintained by the ACARA.

As a final control variable, we include a measure of the school's average financial strength (*FSTR*) in the years before the survey was administered. The school's historical financial position is expected to be associated with resource management because hard budget constraints limit hiring and compensation opportunities and determine the degree to which management's attention will be directed toward meeting

budgetary goals. We measure financial strength using the 36-month moving average of the financial resources available to the school on a per-student basis. Financial resources are defined by the school's bank account balance, adjusted for the projected year-end surplus or deficit in relation to government funds allotted to the school. The government allotment to the school for teacher salaries, infrastructure spending, and other targeted initiatives depends on student enrollment and includes additional funds for low socio-economic status students. Funds from other sources (e.g., fundraising) are included in the bank account and are not taxed or recovered by the government if unspent. The financial data are supplied by the DET for each school. We employ a square root transformation to enhance the normality of the variable.[28]

For the education sector, these control variables are well-aligned with prior research on the antecedents that determine how management controls (including resource management) are used. For example, Widener (2007) finds that competitive uncertainty and operational risk are associated with the types of controls used and Hansen and Van der Stede (2004) find that competition, organizational structure, strategy, production characteristics, and size are associated with budgeting practices. Unlike private schools, our sample of public schools is somewhat insulated from competition since most funding is formulaically determined and provided by the government. Similarly, public schools' organizational structure and staffing requirements are stipulated by the government. The use of type of school (primary vs. secondary) as a control variable captures differences in the organization structure and staffing that are required by the government. Thus, for our sample, these factors that are influential covariates of management control practices in other sectors of the economy are constant and cannot explain variation in resource management practices. In contrast, the socio-economic status of the school's students (which includes whether the school is located in a rural or urban location) varies significantly and speaks to differential uncertainties and operational risks associated with achieving student performance goals with at-risk students. Similarly, controlling for school size speaks to financial uncertainties associated with the government funding formula and the operational uncertainties associated with staffing to the requisite

[28] Three observations with small negative values are set to zero. The exclusion of these schools does not meaningfully alter the reported results.

teacher-student ratios for each grade. In sum, although we conduct this research in a novel setting as compared with much of the literature on management controls and resource management, we have aligned the research variables with prior studies to the extent that they apply to the setting.

3.4.6 Correlations and test of discriminate validity

As Table 2 Panel A indicates, resource management practices are generally correlated with one another. This is consistent with the view that managers jointly select a system of inter-related management practices to achieve goals. Accordingly, we model these practices as a system of management practices that are jointly determined (i.e., with a modeled covariance structure).[29] *EXPLAIN, ENABLE*, and *NFR* exhibit a significant positive univariate association with principal *GMS*. *FUND, HIRE,* and *FR* are not significantly associated with *GMS* in univariate tests. *GMS* is not correlated with the control variables, indicating that multicollinearity is unlikely to post a threat to interpreting the association between *GMS* and resource management.

Discriminate validity, namely, whether the variables measure different constructs, is evaluated through several methods. We use Umphress, Bingham and Mitchell's (2010) approach to test for discriminate validity. Table 2 Panel B provides details of this test using confirmatory factor analysis of the resource management practices along with the *GMS* variable to assess the distinctiveness of the latent variables. As reported, the confirmatory factor analysis results of the comparative (nested) model tests indicate that the hypothesized measurement model containing separate measures for *EXPLAIN, ENABLE, FUND, NFR, FR, HIRE,* and *GMS* provides the best fit to the data (CFI = 0.94, TLI = 0.91, and RMSEA = 0.06) compared to other models where: i) the budget constructs (*EXPLAIN* and *ENABLE*), ii) all financial resource management variables (*EXPLAIN*, *ENABLE* and *FUND*) and all human resource management

[29] In untabulated analysis we also estimate the SEM model setting the correlation between residual errors in resource management practices to zero; that is, assuming that these practices are independent of one another. Our main results are qualitatively unchanged; however, as expected, the model fit deteriorates. Failing to specify correlated errors when there are in fact common unmeasured causes tends to redistribute the correlation toward the exogenous end of the model, which may result in biased inferences (Kline, 2015). Kline recommends estimating the model with the structural error correlations allowed to freely vary when there are theoretical reasons to expect these associations to be present, as the theory of management control systems suggests.

practices (*NFR*, *FR* and *HIRE*), and finally iii) all resource management practices, are constrained to be a single variable.

4. RESULTS

We use structural equation modeling (SEM) with the SPSS-AMOS (version 26) software package to simultaneously estimate the hypothesized measurement model and structural model (depicted in Figure 1). The maximum likelihood estimation method that we employ yields robust estimates when data are based on ordinal scales common in survey research, and when data distributions depart from normality (Boomsma & Hoogland, 2001; Distefano, 2002). SEM is preferred to a regression approach using a system of equations because the former mirrors the assumption that resource management practices are jointly determined and estimates the covariance among practices while simultaneously addressing variable measurement error.[30] For the latent variables that are measured by a single survey item (*NFR, FR, FUND*) or an aggregation of several formative items (*HIRE*), we assume a 0.85 measurement reliability factor and fix the error variance by multiplying by the variance of the single item by 0.15 (i.e., 1.0 - 0.85) (Jöreskog & Sörbom, 1993; Hayduk & Littvay, 2012).[31]

The estimated coefficients of the measurement models relating survey items to the latent variables are consistent with the earlier confirmatory analysis, and overall model fit of the structural equations model is good (Table 3, Panel A and B), as reflected in a variety of indicators (e.g., CFI, IFI, TLI, and RMSEA).[32] The results indicate that principals' growth mindset is positively associated with four of the six resource management practices. Consistent with H1, *GMS* is associated with greater use of the budget for discussing variances and corrective actions (*EXPLAIN*), and as an enabling management tool (*ENABLE*). Consistent with H2, *GMS* is also positively associated with the extent to which principals engage in fundraising

[30] We fit a system of seemingly unrelated regressions (SUR) and find that the SEM results are generally robust to the use of SUR. Results for H1, H3, and RQ1 are unchanged; however, using SUR, H2 is not supported.
[31] We treat *HIRE* as a latent variable in which measurement error arises from the underlying items that are averaged to form this measure; however, the results in Table 3 and Table 4 are robust to treating *HIRE* as a manifest variable.
[32] Good fit is indicated by RMSEA less than 0.06 and fit indices greater than 0.90. Cut off values may be loosened when several fit statistics are used (Hu & Bentler, 1999).

(*FUND*). Turning to human resource management practices, our prediction that *GMS* is positively associated with employee selection practices (*HIRE*) is not supported (H3). It appears that principals employ similar practices when hiring teachers regardless of their mindset. With regard to the relation between mindset and use of rewards (RQ1), we find that *GMS* is positively associated with the use of non-financial rewards (*NFR*) to recognize teacher performance. The estimated coefficient for the association with financial rewards (*FR*) is also positive but falls short of the $p < 0.10$ significance threshold.

The control variables show a mixed association with resource management practices. Larger schools make greater use of financial rewards and are more likely to use budgets as tools to enable managers. Schools with economically and socially disadvantaged students are more likely to have principals who engage in fundraising and use budgets for explaining. Primary schools are more likely to use budgets for explaining and enabling purposes and are more likely to employ non-financial rewards for high performing teachers. Finally, schools with greater financial strength are more likely to use budgets for enabling purposes. However, financial strength is not associated with the degree to which principals engage in the explanation of budget variances and corrective actions taken. Interestingly, financial strength (or weakness) is not associated with the use of either financial or non-financial rewards. Thus, reticence in using rewards appears to be unrelated to the availability of funds, but more to the principal's attitudes toward rewards.[33]

Table 3 (Panel C) confirms the importance of estimating the hypothesized relations between *GMS* and resource management practices as a system of equations. With only four exceptions, the covariances between pairs of resource management practice residual errors are positive and statistically significant, indicating that as theory prescribes, resource management choices are jointly determined to form a coherent set. Although we made no predictions about the nature of covariation in resource management practices, the evidence of positive covariance presents a consistent message that these practices are complements

[33] In untabulated robustness tests, we estimate the model without the control variables. Model fit, as reflected in fit diagnostics, is unchanged, although the squared multiple correlations decline. The measurement model and structural model results of Table 3 are very similar for *EXPLAIN*, *ENABLE*, and *NFR*; however, *FUND* is no longer significantly associated with *GMS*. The results of Table 4 are also qualitatively unchanged when controls are omitted.

rather than substitutes. The four insignificant exceptions are interesting. After accounting for *GMS* and the control variables, those who use budgets as an enabling tool are not more likely to seek external sources of funding, to use non-financial rewards, or to use more inputs when hiring. This could be interpreted as evidence that using budgets as an enabling tool reduces the need for other resource management practices. The fourth insignificant covariance is between the uses of financial (*FR*) and non-financial rewards (*NFR*) to recognize high performing teachers. This absence of covariation may well reflect the idiosyncrasies of the education setting in which non-financial rewards better reflect a choice of the principal, while financial rewards reflect a general resistance to "pay for performance" for teachers. A research setting in which managers have more discretion in selecting the level and the type of reward would likely show significant covariation among these resource management choices.

5. ADDITIONAL ANALYSIS: THE RELATIONSH BETWEEN MINDSET, RESOURCE MANAGEMENT PRACTICES, AND SCHOOL PERFORMANCE

Mindset is a durable personal characteristic, and given the degree of autonomy that principals have over resource management practices at their school, we do not expect disequilibrium conditions between the principal and these practices to be common or to persist. Thus, contingency theory, which predicts that misalignment between a principal's mindset and control choices (Gerdin & Greve, 2004; Grabner & Moers, 2013) would lead to poorer performance (i.e., student learning outcomes measured by *NAPLAN*), are not expected to be readily testable. A priori, we also have no reason to predict that a particular mindset will be associated with school performance.[34] In contrast, average student performance of a school is persistent; thus, we posit that average student performance is a contextual factor that moderates the relationship between mindset and resource management choices. We explore whether principals make different choices

[34] In untabulated results, we estimate a model in which the SEM model of Table 3 is expanded to include direct associations between *GMS* and *NAPLAN*, and between each of the resource management practices and *NAPLAN*. While our results for Table 3 do not change, we find no evidence of a significant direct or indirect association between *GMS* and school performance.

when they are in an underperforming school compared to a well-performing school. From anecdotal evidence and some observations in the field, we explore whether the relation between *GMS* and resource management practices are more positive in underperforming schools (i.e., those schools where test scores were low) as they present a greater management and leadership challenge. A growth mindset is related to greater engagement with problems and challenges, owing to the inherent belief in an individual's ability to improve (Dweck & Leggett, 1988). Thus, we explore the research question:

RQ2: Is the relation between principal mindset and use of resource management practices moderated by the school's historical average student test performance (i.e., NAPLAN)?

To evaluate moderating effects of school performance on the relation between *GMS* and resource management practices, we split the research sample into two maximally different *NAPLAN* math and reading performance groups using the nonhierarchical, k-means clustering method (see Ketchen & Shook, 1996). The two-cluster solution splits the research sample into 106 high performing schools and 127 low performing schools (the research sample is reduced to 233 schools with *NAPLAN* scores). We then establish measurement model (MM) invariance between the performance groups. To do this, we compare the following measurement models: the unconstrained model where the factor loadings of the items that make up the latent variables are allowed to vary between the two performance groups, against the constrained model where the factor loadings are set to be the same for the two groups. Although both models exhibit good fit, comparing their respective CFIs indicate a difference of 0.007, which is smaller than the 0.01 criteria proposed by Cheung and Rensvold (2002) and Meade et al. (2008). Their difference in the RMSEAs of 0.001 is also smaller than the cutoff of 0.015 proposed by Chen (2007). Since the fit for the unconstrained and constrained (common) MM model are not significantly different, we conclude that there is MM invariance between the groups.[35]

[35] The chi-square difference for the constrained and unconstrained models is not significant at the 1% level (but significant at 5%). However, chi-square difference is not the preferred test for MM invariance as it is sensitive to the sample size and the violation of the normality assumption. Therefore, a trivial discrepancy may lead to a rejection of the null (Bollen, 1989; Tucker & Lewis, 1973).

Table 4 reports the structural model of the high and low performing groups. The chi-square difference test indicates the presence of a moderating effect of performance on the relations between *GMS* and resource management practices. The estimated coefficients presented in Table 4, along with the tests of difference between groups indicate that the moderating effect of performance is concentrated in two of the six resource management practices: *FUND*, and *FR*. Even after controlling for school demographics, *GMS* is associated with a much greater engagement in fundraising by principals in low than in high performing schools. *GMS* is also associated with a greater use of financial rewards to recognize high performing teachers in low than in high performing schools.[36]

6. DISCUSSION AND CONCLUDING COMMENTS

We explore the influence of a relatively new managerial trait, mindset, on resource management practices used by school principals. Mindset can fundamentally affect the way an individual behaves and how they interact with others. Dweck and her colleagues demonstrate how this occurs in the classroom and suggest that it would be influential in an organizational setting. Given the demonstrated importance of a growth mindset to learning outcomes and an individual's self-regulating mechanisms, we predict that this trait may have important consequences for the use of resource management practices by school principals. We find that a growth mindset is associated with two dimensions of budgeting that relate to learning; (1) the way a leader uses the budget to explain and hence learn from budget variances and the actions taken to close the gap; and (2), the extent to which budgets are used as an enabler for the principal to be more innovative and flexible, better communicate their strategic goals, shape the culture of the school and overall, to be a better principal. We also find that *GMS* is related to growing the funding base of the school but has

[36] We also fit seemingly unrelated regressions (SUR) to determine if school performance has a moderating effect on the relationship between GMS and resource management practices. When using a dichotomous school performance variable, our results are qualitatively unchanged. When using a continuous school performance variable, GMS remains associated with significantly greater fundraising by principals in low-performance schools than in high performing schools (at $p < 0.01$ vs. SEM's $p < 0.05$), but the differential effect is no longer present with financial rewards. As previously explained, we view the less constrained SEM model as more appropriate for the research questions and better aligned with prior research on managers' use of management control practices.

no significant effect on employee selection practices. The result with selection practices is not consistent with our expectations. It is possible that differences in the use of selection practices between GMS and FMS principals are more nuanced, with each type focusing on similar amounts of inputs to gauge different criteria (e.g., growth potential vs. current performance) when identifying and recruiting individuals. This nuance is something that we are not able to capture with our survey instrument.

We find that *GMS* has a significant positive association with *NFR* but not *FR*. The result for *NFR* may indicate that such rewards are more suited to encourage learning and growth (over strong performance levels), which is deemed to be more important by *GMS*. This may, in turn, be related to the ability of *NFR* to positively impact intrinsic motivation (Deci, Koestner, & Ryan, 1999), and further research in this area is needed. However, this result may not generalize to other settings given public sector workers may not look for economic performance-based rewards to the same extent as their private sector counterparts (Cacioppe & Mock, 1984; Crewson, 1997). The absence of a result with financial rewards is perhaps not surprising, given the reluctance of most principals to use financial rewards. The efforts to introduce performance-based pay in government schools has not been typically accepted in Australia (Preiss, 2015; Australian Education Union, n.d.) nor in many other jurisdictions (The National Union of Teachers, n.d.; Goldhaber, 2006). We do recognize the limitations of our survey instrument with regards to its inability to capture the criteria used when deciding to give out both financial and non-financial rewards, which could be different between GMS and FMS principals.

When we create two subsamples based on learning outcomes, we find significant differences in the importance placed on fundraising, and the use of financial rewards. The relation between the principal's GMS and these two management practices is stronger in low performing schools compared to high performing schools. As school-level *NAPLAN* scores are persistent, we posit that the *NAPLAN* scores are an important contextual backdrop against which the principal selects appropriate resource management practices. Contingency theory suggests an alternative interpretation, namely, that *NAPLAN* performance is a causal *outcome* of misalignment between the principal's mindset and control choices. In that case, performance group differences could be interpreted as indicating that the over-use of *FUND* and *FR* leads

to poor performance. The implausibility of a significant disequilibrium between principals' mindset and their control choices, as well as evidence of significant but limited direct effects of principals (as compared, for example with teachers) on student learning outcomes (Coelli & Green, 2012), argues for performance as a contextual factor in principals' resource management.

Using performance as a contextual factor, the results of our learning outcome subsample analysis are consistent with Demircioglu and Audretsch's (2017) finding that public sector entities tend to be more innovative when there is a greater concern for low performers, and with Mone, McKinley and Barker's (1998) theory on organizational decline and innovation. Mone et al. (1998) argue that if organizational leaders view a decline in performance to be due to causes within their control, then the positive effect of organizational decline on innovation will be stronger. On the other hand, leaders who have a greater external locus of control would tend to resort to less innovative strategies such as retrenchment (e.g., selling assets, laying off employees, and reducing costs) (Musteen, Liang, & Barker, 2011). It is likely that GMS principals have a greater internal locus of control compared to FMS principals because the latter believes that individuals do not have much capacity to learn, develop and change. Therefore, it is perhaps unsurprising that when faced with the context of underperformance, there is a greater difference between GMS and FMS principals in the adoption of innovative strategies such as fundraising and using financial rewards.

We contribute to the literature in several important ways. First, we add to the 'manager effects' literature, documenting that managerial characteristics influence resource management choices. Our findings indicate that a manager's mindset is associated with her use of a particular package of resource management practices. Importantly, we show that some of these relations are different depending on the performance context. Second, we add to the rather scarce literature examining different dimensions of budgeting (e.g., Hansen & Van der Stede, 2004; Becker et al., 2016). And third, we contribute to understanding management practices in the education sector. While we know that highly effective principals can produce significant learning outcomes for students (Helal & Coellli, 2016; Branch et al., 2013), we know little about the management practices of school principals. Our study sheds light on this.

Future studies can then investigate whether these practices, in themselves, can influence an organization's mindset, that is, the shared beliefs of people in the organization (Murphy & Dweck, 2010; Canning et al., 2020).

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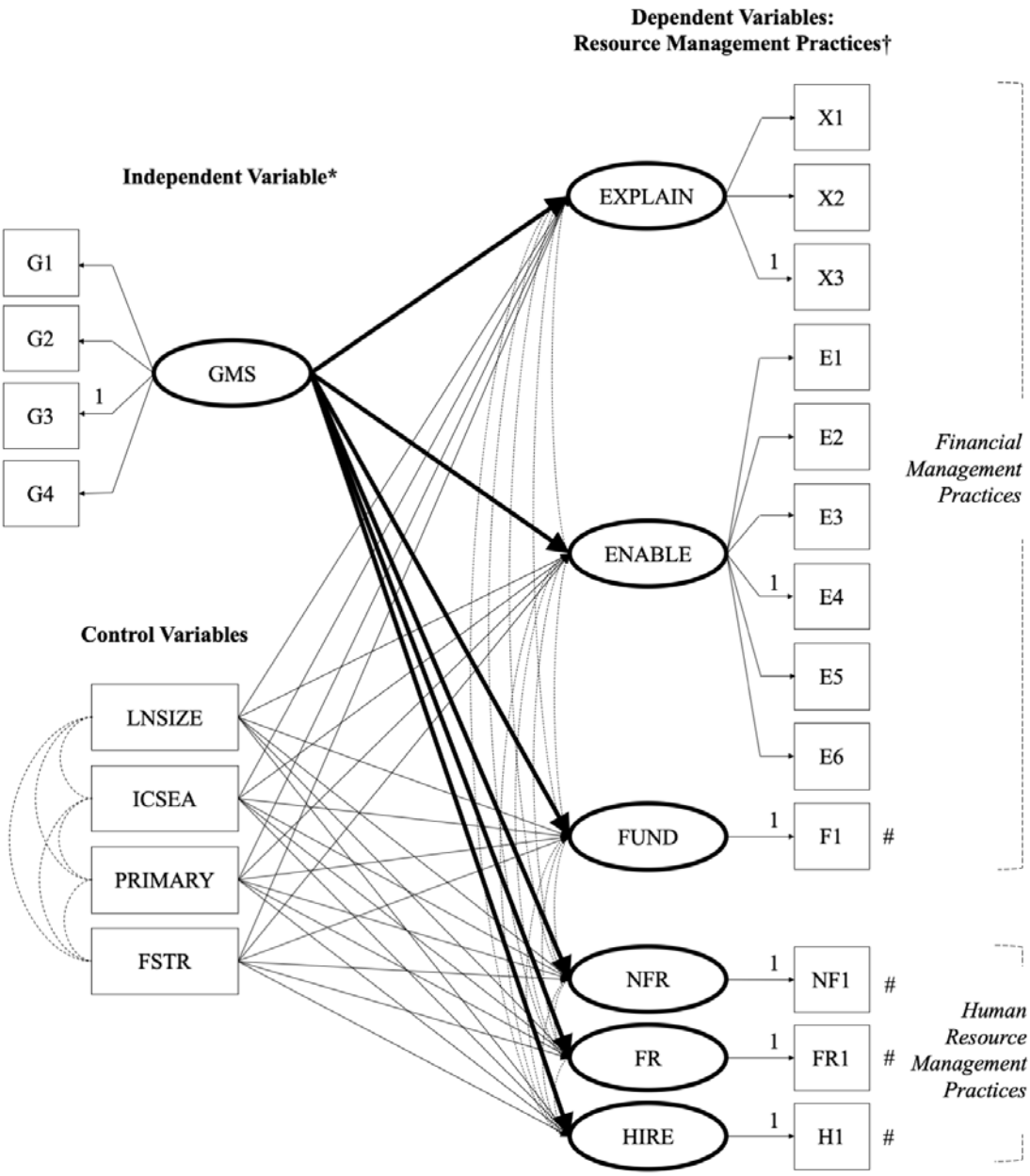
Figure 1
Structural Equation Model



† Although we do not depict them in the above diagram because it would make the diagram difficult to read, we estimate correlations among all of the residual errors of the resource management practices. This modeling choice reflects the expectation that resource management practices are a system of jointly determined practices.

In recognition of measurement error of manifest items, we follow Jöreskog & Sorbom (1993) and fix the error variance of single-item latent variables to 0.15 times the variance of the error term.

* Heavier lines represent the tested hypotheses or research question investigated.

Table 1: Variable Measures: Descriptive Statistics and Measurement Scales
Descriptive statistics are for N = 238 observations with complete records on all variables.

Variable Measures:	Mean	Standard Deviation	Cronbach's Alpha [Composite Reliability]
Dependent Variables: Resource Management Practices			
Financial Management Practices survey items measured on a seven-point Likert-type scale with 1=strongly disagree, 7= strongly agree. Survey items for the three budget practices were presented in random order that varied by the respondent to limit response bias linked to the order of question presentation.			
EXPLAIN: *Extent of discussions of budget variances and corrective actions taken*			.76 [.79]
X1 I provide a formal explanation to key constituents on large budget variances.	6.29	0.98	
X2 I often discuss variations from the budget with key constituents.	6.17	1.09	
X3 I am required to explain actions I take to correct any deviations from the budget.	5.89	1.39	
ENABLE: *Extent of use of budgets as an enabling tool*			.86 [.86]
E1 The budget enables me to better plan the activities for the School	6.17	1.00	
E2 The budget enables me to provide greater strategic direction for the teachers in my School	6.11	1.05	
E3 The budget enables me to be more flexible	5.19	1.40	
E4 The budget enables me to be more innovative	5.28	1.44	
E5 The budget enables me to be a better Principal	4.96	1.52	
E6 The budget enables me to shape the culture of the School	5.85	1.28	
FUND: *Engagement with fundraising to supplement government funds.* Measured with the survey item: I work actively with the School Council and my leadership group to expand the financial resources available to the school. Measured on a seven-point Likert-type scale with 1= not at all, and 7 = to a great extent.	5.64	1.25	
Human Resource Management Practices			
HIRE: a measure of engagement and of resources committed to teacher selection. This formative scale is measured as the average of reported use of nine inputs to the decision to hire a teacher.	3.90	0.63	

In-person interviews	6.84	0.49	
Personality tests	1.15	0.66	
Use of employment agencies	1.77	1.29	
Referral from staff	4.21	1.62	
Classroom observations	3.33	1.90	
Student input	1.87	1.37	
Reference checks - reference provided by candidate	5.15	1.49	
Reference checks - reference not provided by candidate	6.47	1.08	
Candidate presentations	4.33	1.97	
NFR: *Use of non-financial rewards.* Measured with the survey item: Overall, to what extent do you recognize your HIGH PERFORMING teachers and/or teaching teams using NON-FINANCIAL rewards (e.g., verbal recognition, tokens of appreciation, informal leadership roles)? Measured on a seven-point Likert-type scale with 1= never, and 7 = extensive use	5.30	1.23	
FR: *Use of financial rewards.* Measured with the survey item: Overall, to what extent do you recognize your HIGH PERFORMING teachers and/or teaching teams using FINANCIAL rewards (e.g., accelerated increment)? measured on a seven-point Likert-type scale with 1= never, and 7 = extensive use	1.92	1.20	
Independent Variable: GMS, *Principal's Growth Mindset,* survey items presented in random order that varied by respondent, measured on a seven-point Likert-type scale with 1=strongly disagree, 7= strongly agree.			.90 [.90]
G1 Everyone, no matter who they are, can significantly change their basic characteristics.	4.61	1.53	
G2 People can substantially change the kind of person they are.	4.72	1.50	
G3 No matter what kind of a person someone is, they can always change very much.	4.58	1.56	
G4 People can change even their most basic qualities.	4.63	1.57	
Control Variables			
LNSIZE: Natural log of the number of students in the school	5.54	1.16	
ICSEA: A measure of the socio-economic status of students in the school	1010.53	76.33	
PRIMARY: An indicator of school type that is set to '1' if the school serves kindergarten and grades 1-6 students	0.82	0.38	
FSTR: The square root of the three year monthly moving average of the school's financial position per student.	36.58	15.58	

Table 2: Correlation Tables

Panel A: Pearson Correlations of the survey construct-level measures and control variables (N = 238 with listwise deletion)

	Resource Management Practices						**Growth Mindset**	**Controls**			
	EXPLAIN	ENABLE	FUND	NFR	FR	HIRE	GMS	LNSIZE	ICSEA	PRIMARY	FSTR
EXPLAIN	1.00	.28**	.33**	.23**	.19**	.16*	.17**	.04	.14*	.15*	-.12
ENABLE		1.00	.07	.04	.16*	.12	.18**	.08	.06	.13*	-.00
FUND			1.00	.22**	.23**	.20**	.06	.03	.17**	.15*	-.14*
NFR				1.00	.07	.14*	.19**	-.06	.06	.16*	-.07
FR					1.00	.23**	.07	.16*	.04	-.02	-.09
HIRE						1.00	.08	.13*	-.02	-.00	-.09
GMS							1.00	.04	-.10	-.00	-.12
LNSIZE								1.00	.25**	-.43**	-.45**
ICSEA									1.00	.78	-.15*
PRIMARY										1.00	-.10
FSTR											1.00

**, * Correlation is significant at the 0.01, 0.05 level (two-tailed test).

Panel B: Confirmatory factor analysis for all resource management practices and *GMS*

	Chi-square	df	Δ Chi-square	Chi-square / df	CFI	TLI	RMSEA	RMSEA C.I.
Model 4: All resource management practices combined	485.39	118	15.04	4.11	0.78	0.72	0.11	[0.10, 0.12]
Model 3: FRM combined, HRM combined	470.35	116	32.81	4.05	0.79	0.72	0.11	[0.10, 0.12]
Model 2: Budget variables combined	437.54	108	230.82	4.05	0.81	0.73	0.11	[0.10, 0.12]
Model 1: Hypothesized	206.72	102		2.03	0.94	0.91	0.06	[0.05, 0.08]

Note: N = 257. All chi-square values are significant at $p < .01$. The hypothesized model treats all six resource management practices variables and *GMS* as being separate constructs. Model 2 constrains the two correlated and theoretically viable variables (*ENABLE* and *EXPLAIN*) to be the same construct. Model 3 constrains *ENABLE*, *EXPLAIN*, and *FUND* (FRM) as one construct and *NFR*, *FR*, and *HIRE* (HRM) as another construct. Model 4 constrains all six resource management practices as a single construct. The alternative models are subsets (i.e., nested) of the seven-factor hypothesized model. The hypothesized model produces a superior fit to the data than each of the alternative models.

Table 3: Simultaneous maximum likelihood estimation of the measurement model and structural equation model relating principal's growth mindset to resource management practices, controlling for school characteristics (N=257)

Panel A: Standardized [unstandardized] coefficients for the measurement model of latent variables, *t*-statistics of unstandardized estimates (in parenthesis), and associated *p*-values indicated as: ***, **, * for values ≤ 0.01, 0.05, and 0.10 in a one-tailed test.

G/X/E Survey item	GMS (G)	EXPLAIN (X)	ENABLE (E)	FUND	NFR	FR	HIRE[##]
1	.84 [.96] (16.38)***	.76 [.82] (9.31)***	.58 [.42] (10.13)***	.92[1.00](#)	.93[1.00](#)	.92[1.00](#)	.92[1.00](#)
2	.84 [.94] (16.35)***	.80 [.95] (9.44)***	.64 [.50] (11.76)***				
3	.86 [1.00] (#)	.65 [1.00] (#)	.86 [.91] (18.90)***				
4	.76 [.88] (14.19)***		.92 [1.00] (#)				
5			.67 [.76] (12.37)***				
6			.56 [.53] (9.84)***				

Scale of the latent variable is identified by fixing the unstandardized regression coefficient to 1.0 for this item

We treat *HIRE* as a single-item latent variable to incorporate measurement error that could be present when averaging the individual items used to construct this measure. However, results in Table 3 and Table 4 qualitatively unchanged if we treat *HIRE* as a manifest variable.

Table 3 (continued)
Panel B: Standardized [unstandardized] regression coefficients for the structural model, *t*-statistics of unstandardized regression estimates (in parenthesis) and associated *p*-values indicated as: ***, **, * for values ≤ 0.01, 0.05, 0.10 in a one (*GSM* (*EXPLAIN*/*ENABLE*/*FUND*/*HIRE*)) or two-tailed tests (*GMS* (*NFR*/*FR*) and controls)

	Hyp. Sign	EXPLAIN	ENABLE	FUND	NFR	FR	HIRE
GMS	+	.23 [.16] (3.14)***	.21 [.21] (3.12)***	.09 [.08] (1.30)*	.23 [.20] (3.30)***	.09 [.07] (1.22)	.04 [.02] (.55)
Controls							
LNSIZE		.05 [.04] (.54)	.30 [.34] (3.50)***	.04 [.04] (.40)	-.02 [-.02] (-.23)	.22 [.20] (2.35)**	.17 [.08] (1.80)*
ICSEA		.15 [.00] (2.09)**	.02 [.00] (.35)	.17 [.00] (2.40)**	.08 [.00] (1.08)	.01 [.00] (.06)	-.07 [-.00] (-.89)
PRIMARY		.16 [.37] (1.89)*	.28 [.98] (3.70)***	.13 [.38] (1.60)	.15 [.43] (1.82)*	.06 [.18] (.76)	.13 [.20] (1.55)
FSTR		-.03 [-.00] (-.34)	.19 [.02] (2.51)**	-.05 [-.00] (-.60)	-.03 [-.00] (-.40)	.01 [.00] (.07)	-.02 [-.00] (-.22)
Model Fit							
SMC (R^2)		0.11	0.12	0.07	0.09	0.05	0.03
Fit Diagnostics		Degrees of freedom: 146 Chi-square (min. fit): 256.62 ($p \leq .00$) CFI = .94, RMSEA = .05, 90% confidence interval = [.04, .07], TLI = .91					

Table 3 (continued)

Panel C: Estimated covariances between regression residual errors in resource management practices, *t*-statistics (in parenthesis), and associated *p*-values indicated as: ***, **, * for values ≤ 0.01, 0.05, and 0.10 in two-tailed tests.

	eENABLE	eFUND	eNFR	eFR	eHIRE
eEXPLAIN	.32 (3.67)***	.36 (4.44)***	.22 (2.84)***	.19 (2.60)***	.08 (2.10)**
eENABLING		.08 (.78)	.01 (.08)	.21 (2.13)**	.08 (1.46)
eFUND			.28 (3.02)***	.29 (3.22)***	.14 (2.88)***
eNFR				.11 (1.25)	.09 (1.87)*
eFR					.14 (2.96)***

Note: Modest but highly significant correlations indicate the importance of modeling resource management practices jointly - as a system of practices that are jointly determined.

Table 4: Testing the moderating effects of performance on the relation between growth mindset and resource management practices

The results presented are for a multi-group model in which groups are clusters of comparatively high versus low *NAPLAN* school standardized test scores in reading and math. The models are fit simultaneously for both groups and the measurement models are constrained to be common while the structural model parameters are free to vary. For purposes of parameter comparison, the structural parameters of the high and low-performance groups are presented side by side for each resource management practice. Cell entries are the standardized [unstandardized] regression coefficients for the structural model, *t*-statistics of unstandardized regression estimates (in parenthesis) and associated *p*-values indicated as: ***, **, * for values ≤ 0.01, 0.05, and 0.10 in a one (*GSM* (*EXPLAIN*/*ENABLE*/*FUND*/*HIRE*)) or two-tailed test (*GMS* (*NFR*/*FR*) and controls), and the critical ratio for the test of whether the estimated association between growth mindset and the specified resource management practice is significantly different between the two groups. (N=233)

	Hyp. Sign	**EXPLAIN**		**ENABLE**		**FUND**		**NFR**		**FR**		**HIRE**	
		Low	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
GMS	+	.07 [.05] (.68)	.19 [.08] (1.68)**	.30 [.33] (3.24)***	.16 [.14] (1.47)*	.20 [.19] (2.01)**	-.12 [-.09] (-1.22)	.16 [.16] (1.58)	.19 [.14] (1.73)*	.20 [.19] (1.95)**	-.05 [-.04] (-.45)	.10 [.05] (.99)	.19 [.08] (1.71)**
Critical ratio[(a)] for test of group difference		0.35		-1.33		-2.32**		-0.17		-1.74*		0.45	
LNSIZE		.04 [.04] (.39)	-.06 [-.04] (-.34)	.34 [.48] (3.35)***	.13 [.17] (.78)	-.16 [-.19] (-1.46)	-.29 [-.32] (-1.84)*	-.04 [-.05] (-.37)	-.22 [-.24] (-1.29)	.15 [.19] (1.31)	-.01 [.01] (-.06)	.08 [.05] (.72)	.33 [.20] (1.96)**
ICSEA		.10 [.00] (.92)	.12 [.00] (1.01)	-.14 [-.00] (-1.52)	.10 [.00] (.82)	.06 [.00] (.58)	.49 [.01] (4.45)***	.10 [.00] (.94)	.16 [.00] (1.35)	-.06 [-.00] (-.51)	.16 [.00] (1.28)	-.32 [-.00] (-3.03)***	-.06 [-.00] (-.53)
PRIMARY		.28 [.67] (2.42)**	.09 [.13] (.60)	.39 [1.38] (3.88)***	.16 [.49] (1.10)	.14 [.40] (1.23)	-.09 [-.21] (-.61)	.17 [.54] (1.50)	.02 [.04] (.12)	.04 [.11] (.31)	-.06 [-.15] (-.36)	.18 [.28] (1.61)	.20 [.27] (1.33)
FSTR		.08 [.01] (.78)	.04 [.00] (.29)	.12 [.01] (1.33)	.09 [.01] (.71)	-.01 [-.00] (-.10)	-.24 [-.02] (-1.89)*	.07 [.01] (.71)	-.08 [-.01] (-.61)	.02 [.00] (.19)	-.06 [-.01] (-.46)	.02 [.00] (.22)	.02 [.00] (.17)
Model Fit													
SMC (R^2)		0.09	0.07	0.22	0.06	0.11	0.27	0.07	0.09	0.06	0.03	0.11	0.10
Fit Diagnostics		Degrees of freedom: 302 Chi-square (min. fit): 458.05 ($p \leq .00$) CFI = .91, RMSEA = .05, 90% confidence interval = [.04, .06], TLI = .86											

a. The critical ratio is the difference between the unstandardized parameters, divided by the estimated standard error of the difference.

Appendix 1: Studies on budgets that used constructs developed by Swieringa and Moncur (1975)

	Paper	Author	Journal	Year	Construct of interest	Comment
1	Some behavioral aspects of budgeting for control: An empirical study	Searfoss	Accounting, Organizations and Society (AOS)	1976	All: budget-related behavior	S&M's 44 questions reduced to 13 factors: (1) participation in planning (2) evaluation by the budget (3) enabling features of budgets (4) participation in budget systems (5) limiting features of budgets (6) support from budget (7) acceptance of methods (8) required explanation of variances (9) interaction with superior (10) difficulty in meeting budget (11) participation in feedback; 2 unidentified factors
2	Influences on departmental budgeting: an empirical examination of a contingency model	Merchant	AOS	1984	All: budget-related behavior	S&M's 44 questions reduced to 6 factors: (1) required explanation of variances (2) influence on budget plans (3) interactions with subordinates (4) reactions to expected budget overruns (5) interactions with superiors (6) personal involvement in budgeting
3	Impact of Participation in the Budgetary Process on Managerial Attitudes and Performance: Universalistic and Contingency Perspectives	Govindarajan	Decision Sciences	1986	Participation	Participation is extracted through a factor analysis of 44 questions developed by S&M
4	The impact of environmental uncertainty, managerial autonomy and size on budget characteristics	Ezzamel	Management Accounting Research	1990	All: budget-related behavior	S&M's 44 original questions simplified to 14 questions and then reduced to 5 factors: (1) participation (2) goal difficulty (3) evaluation (4) required explanation (5) interactions with superiors
5	Budget-related behavior in public sector organizations: Some empirical evidence	Williams et al.	AOS	1990	All: budget-related behavior	S&M's 44 original questions reduced to 10 factors: *Enabling change*: (1) inflexibility and inertia; *Measure of monitor*: (2) required explanations of variances (3) reactions to expected budget overruns (4) budget analysis (5) evaluation by the budget (6) participation in feedback; *Participation*: (7) influence on budgeting plans (8) involvement in budget process; *Formality of communication* (9) infrequent interactions with subordinates (10) infrequent interactions with superiors
6	Budget use, task uncertainty, system goal orientation and subunit performance: A test of the 'fit' hypothesis in not-for-profit hospitals	Abernethy and Stoelwinder	AOS	1991	Budget evaluation	5 items from S&M and Fertakis (1967): (1) required to submit explanations concerning budget variances (2) investigate items which are overspent (3) held personally accountable for budget variances (4) meeting budget important to superior (5) subunit evaluated on budget performance

7	Testing a Model of Cognitive Budgetary Participation Processes in a Latent Variable Structural Equations Framework	Magner et al.	Accounting and Business Research (ABR)	1996	Budget utility	2 out of 3 items from S&M: (1) the budget enables me to keep track of my success as a manager (2) the budget enables me to be a better manager
8	Political and Industrial Relations Turbulence, Competition and Budgeting in the Nationalised Jute Mills of Bangladesh	Hoque and Hopper	ABR	1997	All: budget-related behavior	S&M's 44 original questions reduced to 8 factors: (1) involvement in budget, (2) accountability for budget, (3) evaluation by budget, (4) interactions with supervisors, (5)interactions with subordinates, (6) analysis of budget, (7) influence on budget, (8) enabling change
9	Power, organization design and managerial behaviour	Abernethy and Vagnoni	AOS	2004	Use of budget information	4 items adapted from S&M: (1) to what extent is meeting the budget for your unit of great importance to the person to whom who are responsible (2) to what extent are you evaluated on budget performance (3) to what extent are you held personally accountable for budget variances occurring in your unit? (4) to what extent are you required to report actions taken to correct causes of large budget variances?
10	Antecedents of Budget Participation: Leadership Style, Information Asymmetry, and Evaluative Use of Budget	Kyj and Parker	Abacus	2008	budgeting evaluation	Adapted the 5 items developed by Abernethy and Stoelwinder (1991), which were originally from S&M and Fertakis (1967) (1) The importance of meeting the budget to your supervisor. (2) The extent to which you investigate items which are 'overspent' against budget. (3) The extent to which your department's performance is evaluated against budget. (4) To which extent are you held accountable for budget variances? (5) To what extent are you required to submit explanations concerning budget variances?

Appendix 2
Brief Description of Budgeting Behavior

Respondents were asked which description best fitted the way they used the budget. They were instructed to only tick one box.

I do not spend a great deal of time on preparing the budget because there are more effective tools for implementing our strategic plans and targets. Preparing the budget is a relatively routine exercise that is based on our expenditure from last year and adjusted for any enrolment changes we expect in the following year. My business manager prepares the first draft and then I discuss with my leadership team before finalising, submitting to the School Council for ratification and approval. Once the budget is finalised, I simply monitor our expenditure against budget. There is rarely any need to change the budget once enrolment numbers have been confirmed.

I devote a great deal of time to developing the budget every year because it is an important tool for implementing our strategic plans and targets. I consult widely with my leadership team and make changes based on our Annual Implementation Plan. Budget preparation often requires many discussions with various stakeholders as to the resources needed to achieve our AIP. After I complete the budget and my business manager prepares the document, we submit it to the School Council for ratification and approval. During the year I regularly revise the AIP and the budget in the light of what is occurring in my School.