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How Leaders Respond to Diversity: The Moderating Role of Organizational Culture on Performance Information Use¹

Simon Calmar Andersen, Aarhus University

Bartholins Allé 7, Building 1340, 327

8000 Aarhus C, Denmark

&

Donald P. Moynihan, University of Wisconsin-Madison

1225 Observatory Drive, Madison WI, 53706

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Abstract

Two central governance challenges are directing leadership attention to performance data, and the management of diversity. This paper examines connections between the two, asking if the introduction of diversity, as a form of organizational change, is associated with greater leadership use of performance data. Diversity is theorized as a double-edged sword for organizations, generating greater innovation, creativity, and performance, but also conflict. We propose that leaders will be motivated to use performance data to understand, manage, and explain the effects of diversity. To study this question we employ a randomized controlled field experiment where organizations are assigned new employees that bring role and educational diversity. We find that leaders are more responsive to these two types of functional diversity when they view their organization as lacking an innovative organizational culture.

Introduction

Given the reliance in contemporary governance on performance data for accountability and improvement purposes, the use of performance information has been framed as a “big question” for public management scholarship (Moynihan and Pandey 2010; see also Kroll 2015; Heinrich 1999; Van Dooren and Van de Walle 2008). We know relatively little about leadership use of performance data, or how organizational change alters performance information use. To cast some insights on these questions we consider how diversifying the role and education of employees matters to leadership performance information use. If employees are core to organizational identity, then changing the nature of those people represents a fundamental form of organizational change.

How, then, do leaders respond to the diversification of the workforce? Diversifying an organization can be justified on the basis of increased innovation, creativity and performance, but may also create friction between employees (Joshi and Roh 2009). In this study we suggest that both the form that diversity takes and the culture in which it is embedded affect leader reactions.

Diversity is popularly understood and frequently examined in terms of bio-demographic factors, such as race, ethnicity, and gender.² This framing of diversity is dominant in public management studies of the topic. In this paper we focus on functional diversity: an alternative framing of diversity as reflecting the mix of skills, educations, backgrounds and experiences in

² We use the term bio-demographic in this paper, but this broad category of variance between individuals has also been referred to as surface-level diversity (Harrison et al 2002), identity diversity (Hong and Page 2004) or relations-oriented diversity (Jackson, May, and Whitney, 1995; Joshi and Roh 2009).

groups. The mixed effects of diversity appear to partly relate to the type of diversity or particular industry setting (Johsi and Roh 2009), but may also be driven by contextual factors such as the growth orientation and innovation strategy of the organization (Richard 2000; Richard et al. 2003). Our hypotheses extend theory on how diversity works in organizations by incorporating variables that reflect the organizational context. This is an area where a recent review of scholarship notes that more work is needed (Joshi and Roh 2009, 621): “Aspects of organizational context such as managerial demography, climate, culture, and leadership also merit closer scrutiny in future research.” Yet, attention to organizational context in prior work is constrained by the neutralization of contextual factors in lab experiments, and potential endogeneity between diversity and contextual factors in observational studies.

We overcome these limitations by using a randomized controlled field experiment that allows us to observe the effects of introducing different types of functional diversity into actual organizations (schools in Denmark), and to account for the role of contextual factors such as leadership and culture. The treatments vary functional diversity in terms of educational background and role differentiation. In the first treatment new employees with the same educational background as existing teachers in a classroom were hired to fulfill an existing organizational role of co-teacher in a classroom (the “status quo” treatment). In the second treatment, schools can hire an employee from any other educational background to fulfill the same co-teacher role (“educational diversity” treatment). In the third treatment, schools hire an individual who shares the educational background of existing teachers to fulfill a novel organizational role: observing and providing advice to teachers (the “role diversity” treatment). Both the educational and role diversity treatments provide two different functional diversity treatments. The effects of these treatments were compared to schools that were assigned no

additional resources (the control group). Having both a control group and a status quo treatment enables us to rule out the possibility of alternative explanations for our results, e.g., the effects are driven by the addition of a new employee or resources, or a “Hawthorne” effect of simply being observed.

Contributions

The study offers a number of contributions to the research literatures on performance information use and diversity. First, we introduce alternate conceptualizations of diversity to a public management audience. Previous studies in the field have focused predominantly on race and gender. We examine educational and role diversity in public organizations.

Second, we examine how leaders respond to the introduction of diversity in their organization. Despite the existence of a careful research literature on diversity effects, there has been little attention to the role of leadership generally (Somech 2006, 133), and especially to the specific question we pose. Prior work documents how leaders manage diversity, but not how leaders respond to diversity. If the introduction of diversity does indeed change internal organizational factors, leaders may feel compelled to understand, manage and explain those changes. Conflicts must be resolved, new innovations must be corralled or championed. Specifically, we examine if leaders direct more attention to performance data after functional diversity is added to their organization.

Third, the analysis contributes to the growing literature on performance information use. Experimental designs have increasingly offered insights into role of leadership, job design, and motivation on public sector performance (e.g., Bellè 2014; Brewer and Brewer 2011), and have facilitated an understanding of how citizens (James 2011) and elected officials (Nielsen and

Baekgaard 2013) use performance data. But a recent review of this literature notes that the topic remains dominated by cross-sectional survey designs (Kroll 2015). Beyond the methodological limitations, the static nature of cross-sectional data are so unsuited to theoretical questions that center on temporal effects as to leave them largely unaddressed (Oberfield 2014). As a result, we know little about how organizational change matters to performance information use, even as performance data provides a relatively novel tool by which managers can assess the effect of and respond to such change. Our study represents the first field experiment we are aware of that introduces real organizational change and assesses its effects on performance information use.

A final contribution is to examine the moderating effect of organizational culture. Previous research suggests that the benefits of diversity depend on the organizational culture in which it is embedded (Jayne and Dipboye 2004; Curtis and Dreachslin 2008). If diversity does indeed bring both conflict and innovation, leadership response to diversity may be contingent on perceptions of existing organizational needs (Richard 2000). In organizations perceived as lacking an innovative culture, leaders may become more responsive to functional diversity.

Our results provide evidence that diversity generates greater managerial use of performance information. Consistent with our hypothesis, the status quo treatment has no effect relative to a control group, but the “educational diversity” and “role diversity” treatments are associated with higher leadership use of performance information in organizations perceived as less innovative. These two treatments generate greater performance information use in organizations where leaders perceive a lack of innovation.

In the next section, we examine different conceptualizations of diversity and review research on its effects. We then offer hypotheses that relate diversity changes and culture to performance information use, before presenting our analytical strategy and results.

Theories of Diversity

We treat diversity as arising “from any attribute people use to tell themselves that another person is different” (Williams and Reilly 1998, 81). This description of diversity is broad enough to make clear that what constitutes diversity varies according to particular contexts, and how individuals identify and construe differences in that context.

Different theoretical frameworks help to further explain the mixed effects of diversity (summarized in greater detail in Williams and O’ Reilly 1998; Mannix and Neale 2005; Pitts and Jarry 2007). The potential for conflict arises from social identity (Ashforth and Mael 1989) or similarity-attraction processes (Byrne 1971). Both similarity-attraction and social identity start with the assumption that individuals engage in social categorization of others. This process relies on observable cues to assess if individuals hold common or divergent attributes with the observer or dominant group, then placing others in an “in-group” or a less favorable “out-group.”

Since “surface-level” or bio-demographic factors such as race, gender, and age are mostly easily observable (Harrison et al. 2002) and may be tied to underlying individual biases, social categorization processes tend to result in exclusion and conflict. Even if the basis of differentiation is objectively a poor predictor of an individual’s ability to complete a task, social categorizations largely correlate with negative processes and outcomes. Individuals categorized in the “out-group” may be assumed to be less capable, cooperative, or trustworthy, and given little chance to overcome these prejudices. Individuals enjoy smoother working relationships with those in the “in-group.” Shared characteristics become a basis for higher interpersonal comfort and trust, and reinforcement of norms.

The information/decision-making approach is an alternate theoretical framework that has generated more positive accounts of diversity (Ely 2004; Mannix and Neale 2005). The approach assumes that more diverse groups have an inherent advantage over homogenous groups by virtue of access to a wider array of knowledge to generate, interpret, and respond to information (Hong and Page 2004). To the extent conflict arises it is part of a productive exchange of views that facilitates problem-solving, rather than an ongoing tension triggered by underlying prejudices and group status. The additional capacities provided by diversity are expected to offset the potential cost of conflict. Because this perspective is associated with the expertise, skills and experiences of individuals, it fits more easily with the functional diversity framing and is the primary basis for positive accounts for why diversity improves organizational performance.

The role of diversity has been widely examined across the social sciences featuring studies at the group, organizational, and community level (Esteban, Mayoral and Ray 2012; Laitin and Jeon 2013; Page 2007). The level of analysis, and associated findings, tends to vary by discipline, and by which theoretical framework is used. Social psychologists generally rely more on an information/decision-making approach and examine how diversity improves performance on specific tasks. Political scientists and economists who relate diversity to ethnic conflict and societal instability are more critical (Laitin and Jeon 2013).

Studies of diversity within organizations tend to also offer a mixed picture, reflecting Milliken and Martins' (1996, 403) formulation of diversity as "a double-edged sword, increasing the opportunity for creativity as well as the likelihood that group members will be dissatisfied and fail to identify with the group." Literature reviews and meta-analyses give credence to the double-edged sword metaphor. In general, diversity is associated with greater creativity, and performance, but it may also reduce social cohesion, generate conflict and delay decisions (Bell

et al. 2011; Joshi and Rohi 2009; Horowitz and Horowitz 2007; Mannix and Neale 2005; Williams and Reilly 1998).

Conceptualizing Diversity: Bio-demographic and Functional Approaches

There are not only competing multiple theories of diversity, there are also different ways to conceptualize and measure diversity. In this section we detail the differences between these conceptualizations in order to distinguish how our functional approach is distinct from the bio-demographic approach more typical in public management scholarship.

Public sector scholarship has framed diversity issues in terms of representative bureaucracy (the match between a public employee and the broader population or client group), the effect of diversity on outcomes such as organizational performance, and how diversity is managed. Collectively the empirical work on diversity in the public sector reflects diversity in terms of variance in bio-demographic factors: race, ethnicity, age, and gender. In part, this reflects the fact that governments, and diversity management programs, define diversity in bio-demographic terms. A reliance on bio-demographic markers may also reflect normative arguments about representation in a democratic context, basic fairness in the distribution of public goods, and reducing group-based discrimination in the workplace. Such concerns animate studies of diversity in non-public settings also, e.g. studies of bias and discrimination in hiring practices (e.g. Betran and Mullainthain 2004).

Empirical assessments of bio-demographic diversity on performance in public organizations are mixed, but largely negative (Choi and Rainey 2010; Pitts 2005; Pitts and Jarry 2007; Pitts et al. 2010). By contrast, there is consistent evidence “that when public organizations manage diversity well, they will perform better” (Oberfield 2014, 779). Well-managed diversity

programs are associated with positive outcomes on variables such as turnover intention (Choi 2009; Groeneveld 2011), organizational commitment (Ashikali and Groeneveld 2013), job satisfaction (Choi and Rainey 2014; Pitts 2009) and perceived organizational performance (Choi and Rainey 2010; Oberfield 2014; Pitts 2009).

Functional diversity rests on differences that alter how people encode and solve problems (Hong and Page 2004, 1685) and has been studied as variance in inter-group skill, education, functional background, experiences and perspectives.³⁴ In the experimental design that follows, we vary diversity on two dimensions of functional diversity. For the educational diversity treatment, employees with a different educational background than those of existing employees are introduced. For the role diversity treatment, the new employees share the dominant educational background as existing members, but are asked to fulfill a novel role: observing and giving feedback to existing teachers rather than helping to teach students. Common to both forms of diversity is the expectation is that the new employees will bring a new perspective to task performance that disrupts taken-for-granted assumptions, resulting in heightened dialogue within the organization about process and outcomes.

³ Though research has not sought to explicitly examine such overlaps, it is of course plausible that the two categories of diversity overlap in practice.

⁴ While we seek clarity by using existing conceptual language from diversity studies, we note the possibility of some confusion of terms here. First, functional diversity is also sometimes referred to as task or cognitive diversity (Joshi and Roh 2009; Horowitz and Horowitz 2007). Second, the *functional background* of the individual (i.e. if they worked in different types of jobs) is one aspect of the broader category of *functional diversity*, which refers to different ways in which individuals view or approach a task.

How Leaders Respond to Diversity

While it is not contentious to claim that the benefits of functional diversity likely depend upon some control of how the process and group is managed (Mannix and Neale 2005), there has been limited attention to the role of leadership in models of diversity. One stream of scholarship deals with diversity management, concentrating on formal programs or managerial strategies to limit the potential negative effects of bio-demographic diversity (Curtis and Dreachslin 2008; Groeneveld 2011; Oberfield 2014; Pitts et al. 2010). For example, Choi and Rainey (2010) find that the negative relationship between racial diversity and perceived organizational performance actually becomes positive when effective diversity management practices are accounted for. While such work indicates the promise of understanding diversity management, we focus on how diversity influences other forms of management behavior.

There is also some limited research on how leadership style moderates the effect of diversity, with support for the hypothesis that more diverse teams function and perform better when effective (Lovelace, Shapiro and Weingart 2001), task-oriented (Klein et al. 2011), participatory (Somech 2006) or transformational (Ashikali and Groeneveld 2013; Kearney and Gebert 2009; Shin et al. 2012) leaders are present. Again, this research approach is slightly different from our question, examining how diverse groups respond to leadership style, rather than how leaders respond to diversity.

The limited existing attention to leadership in diversity studies has, in turn, limited attention to the centrality of leaders in responding to diversity. A fundamental structural characteristic of actual organizations is to channel both the positive (innovation) and negative (conflict) aspects of group diversity to higher levels of authority for resolution (Hammond 1986).

New innovations may need additional resources or permission to be implemented, while leaders will be called on to resolve conflict and move decisions forward. In the next section, we present one plausible way leaders might respond to diversity, which is to invest greater effort in understanding and integrating the effects of diversity on organizational performance.

Leadership Use of Performance Information

At the broadest level, we are interested in whether the introduction of organizational change fosters the use of performance data – whether organizational leaders are spurred to direct more attention to performance information in order to better understand the effects of organizational change. There has also been limited attention to the role of leadership and performance information use. In general, leadership has been treated as an important variable in terms of understanding the performance information use of followers (Kroll 2015). Existing work points to ways that new leaders facing unfamiliar environments are motivated to use performance information to improve performance (Boyne et al. 2010) and to a relationship between leadership and performance information use. For example, transformational leadership style increases performance information use (Moynihan, Pandey and Wright 2012) and even performance among followers (Bellé 2014).

In particular, we propose that as organizational changes are more novel – represented by more diverse new personnel – the impetus to seek out performance data becomes greater relative to conditions of no change, or where change is familiar (represented by new personnel who are not diverse). Performance information becomes more important as a way of knowing when organizational actors know relatively little about a phenomenon. The introduction of diversity represents an ideal way to study these propositions. One source of agreement across the

competing theoretical frameworks detailed above is that diversity has a strong potential for disrupting existing arrangements.

Our propositions on the role of change and performance information use have not previously been tested, though some circumstantial evidence comes from the effect of variables that test managerial experience, which has been shown to correlate negatively with performance information use studies (Moynihan and Hawes 2012; see also Kroll 2015). This suggests that as managers believe they have less organizational knowledge, performance information use is viewed as a means to compensate. Our hypothesis encodes a similar logic: as novel changes are introduced into the organization, leaders turn to performance data to assess the effect of and respond to those changes. The diversity literature suggests that diverse personnel generate both friction and innovation, which should further strengthen leadership interest in understanding and managing the impact of change. Indeed a post-experiment evaluation of the treatments we study confirmed significant effects on student outcomes.⁵

We propose that the introduction of diversity will encourage leaders to seek out performance data for three related purposes: to understand if change is having an effect, to manage change, and to explain it. With the introduction of diversity in the organization, leaders may simply be curious whether these new type of employees are making any difference in legitimized measures of performance. New types of employees represent a new type of input or technology and leaders may wish to assess if and how this investment matters to performance.

⁵ In general, the results found that the provision of teaching assistants (the status quo and team diversity treatments) improved reading scores, but not math scores, while the role diversity treatments helped improve outcomes most for classrooms with students with special needs (author identifying reference).

Diversity should introduce some disruptive effects in the organization, effects that the leader may be compelled to manage. In our experiment, co-teachers who come from a non-traditional background may question existing modes of teaching, offer new ideas, generate conflict with existing staff, or raise concerns about whether their presence is undermining classroom outcomes. In the context of team-based work environments, they offer a disruptive presence that may require other employees to change their own work approach. New employees who play the unusual role of systematically assessing teachers and giving them feedback are also likely to generate some novel ideas about how teachers might approach their job. If adopted, these ideas could engender both conflict and frustration among the teachers being observed as well as new processes. Leaders are likely to be the final organizational arbiter in managing the disruption that arises from diversity, resolving conflicts and adjudicating over new processes. Performance data provides a basis by which they can make informed decisions in managing disruption.

Finally, a basic role of organizational leaders is to explain the organizations' standing and progress, and performance data provides a means to do so. This role is most apparent in studies that have found that diversity external to the organization facilitates higher performance information use (Bourdeaux and Chikoto 2008; Kroll 2015; Moynihan and Hawes 2012). These studies suggest that leaders are compelled to use performance data to respond to external groups with competing preferences, or to rely on a data-based justification for decisions. Such a logic applies to using performance data for internal purposes also. In the aftermath of a disruptive event leaders may turn to performance data to help them explain to employees the impact of change and to justify choices that leaders have made.

H1: The introduction of functional diversity will increase leadership performance information use.

The Moderating Role of Culture

As we consider how leaders respond to diversity, we also take into account how leaders' assessment of the organization shapes that response. To do so, we examine one of the most fundamental organizational factors in the form of organizational culture. In studies of diversity effects, there are relatively few treatments of the role of culture as a moderating factor on the effects of diversity. Growth orientation and innovation strategy have been found to increase the effects of diversity on performance (Richard 2000; Richard et al. 2003), but these studies do not examine leaders' responses to diversity. More often, culture is examined in terms of how the group understands diversity, with cultures that allow all individuals to contribute and receive a respectful hearing more likely to benefit from diversity. Organizational cultures that value diversity (Ely and Thomas 2001) or people generally (Jehn and Bezrukova 2004) seem to dampen the negative effect and encourage the positive effects of organizational diversity. More collectivist cultures with strong shared values also appear better able to overcome the potential conflict that arises from diversity (Chatman et al. 1998; Chatman and Spataro 2005).

Prior studies also suggest that culture matters to performance information use: Cultures supportive of performance management or rational values are associated with higher use (e.g. Yang and Hsieh 2006; Taylor 2011). In terms of more specific organizational traits, Moynihan and Pandey (2010) offer evidence that developmental or innovative cultures are associated with the use of performance data, and Moynihan, Pandey and Wright (2012) suggest that the positive

relationship between transformational leadership behavior and performance information use is mediated by developmental culture (see also Kroll 2015).

One shortcoming of prior studies relating culture to performance information use is a reliance on cross-sectional designs and common-source methods. This work models developmental culture as having a direct effect on performance information use, or uses developmental culture to explain the impact of other variables, but has not examined how culture interacts with diversity to influence performance information use, or how perceptions of organizational culture shape leadership performance information use.

In their own performance information use, leaders may respond to developmental cultures differently from followers. We propose that as leaders see their own organizational culture as lacking a sense of innovation, the benefits of diversity loom larger: Leaders become more responsive to functional diversity that may generate the innovation they believe does not exist in the existing culture. In such settings, organizational leaders may recognize the need for improvement and be more open to outside influence.

We propose that shaking things up becomes more attractive when leaders perceive the status quo as excessively stagnant. Using the categories of understanding, managing and explaining change described above, leaders may be more motivated on all three dimensions to use performance data when they see the culture as dysfunctional (Boyne et al. 2010). They have a greater reason to understand whether disruptive change is creating a positive difference. Leaders may hope that diversity generates conflict and innovation in a stagnant culture and rely on performance data to manage these tensions and opportunities. It may also be the case that leaders believe that if they already enjoy an innovative culture, this will moderate the potential negative performance effects of diversity, giving them less reason to attend to performance data.

For example, Choi and Rainey (2010) find that public agencies with a results-oriented culture and age diversity have higher perceived performance. Finally, leaders may perceive that they will have to explain the value of change that arises from diversity to a greater degree if they view their culture as unwelcoming to innovation and therefore have to rely on an externally validated source of information to justify change.

H2: Leaders will be more likely to use performance data as a result of functional diversity when they perceive their organizational culture as lacking innovation.

Analytical Approach

In our analysis, we examine how leaders respond to the random assignment of functional diversity in their organization. Oberfield (2014a) notes that while many management variables imply temporal processes, they are addressed using atemporal research techniques, such as cross-sectional data. In the case of diversity management, Oberfield (2014) shows that cross-sectional designs tend to overestimate the effect of diversity management practices on perceived performance. Cross-sectional designs may not only result in empirical problems, but also discourage attention to questions that have a clear temporal dimension, such as the effects of organizational change. A review of recent research on performance information use is marked by an absence of explicitly temporal variables (Kroll 2015).

Prior work on the effects of diversity largely rests on laboratory experiments and observational studies. By contrast, we employ a field experiment to test our hypotheses. The field experiment was conducted in Denmark in co-operation with the Ministry of Education, which allocated \$6 million dollars to the experiment. In Denmark, schools are operated by 98 multi-purpose municipalities, and all were invited to participate in the experiment. Among the 68

applicants, 18 municipalities were selected with purposeful sampling to ensure variation in terms of geography and school size.⁶ Details of the randomization procedure as well as a test showing that the experimental groups balance on observed variables are presented in the appendix.

The field of education is an appropriate policy venue to expect leadership interest in change to reflect itself in performance information use. In Denmark (Andersen 2008; Hvidman and Andersen 2014; Greve 2006), as elsewhere (Moynihan and Hawes 2012), there has been a turn to quantitative indicators of student outcomes as a means of holding schools accountable and as a tool to improve performance. Performance data therefore should have high salience for the leaders studied.

⁶ This raises questions of selection and generalizability between the majority of municipalities that participated, and those that did not. To address this issue we examined schools in participating and non-participating municipalities. Across 28 observable characteristics – including school size, student/teacher ratio, school and other public expenditures, and socioeconomic characteristics – there were no significant differences from schools that did participate in the survey (results available upon request). The only exception is municipal size. The 68 municipalities that signed up for the trial were slightly larger in terms of area and number of schools than the 30 non-participants. We believe that larger municipalities were more likely to sign up because their greater number of schools meant that at least some schools would be ready to participate. Concerns about generalizability should also be tempered by the highly centralized nature of schools in Denmark (Meier et al. 2015), making it more reasonable to assume generalizability across the Danish setting than, for example, generalizing from education in one US state to another.

Treatments: Functional Diversity

The field experiment gave participating schools resources to hire different types of new personnel. How those employees differ from existing employees creates functional diversity within the school, allowing us to examine if variation in the introduction in functional diversity is associated with variation in leadership use of performance data. Schools were assigned to four treatment conditions:

1. Control group: School principals in the control group did not receive additional human resources.
2. Status quo treatment: School principals were granted a budget of approximately \$25,000 to hire new employees, but with the stipulation that the hires have a BA in teaching. The new hires therefore share the educational background of existing teachers, while filling an existing organizational role as a co-teacher in the classroom for 10.5 lessons a week.
3. Educational diversity treatment: School principals were granted a budget of approximately \$25,000 to hire new employees, with the stipulation that these hires have any educational background other than a BA in teaching. In practice, these hires have been used as co-teachers in the classroom for 16.5 lessons a week.
4. Role diversity treatment: School principals were assigned an individual hired by the municipality to fulfill a new organizational role: an outside observer who regularly visited the schools, observed teaching, and gave advice and feedback to the classroom teacher. However, these outside observers shared the same educational background of existing teachers (a BA in teaching) and had significant teaching experience. They were allocated to the school 2.5 hours a week.

We consider the educational diversity and role diversity treatments as alternate measures of functional diversity that are more novel than the status quo treatment. In Denmark there is a general legal requirement for teachers to have standard educational training, and exemptions are rare partly due to the power of teacher's unions. The impetus for leaders to seek out performance data is expected to be greater for the educational and role diversity treatments.

Since the treatment is the different hiring options school principals are offered, this design ensures full compliance: We control that school principals in the treatment group are told what group they are assigned to, and that schools in the control group are told that they are not going to receive any new staff. Since the control group receives no resources, one potential concern is that effects we find are driven by the provision of resources rather than by diversity. However, it is worth noting that status quo treatment, which we theorize will have no impact on performance information use, is provided resources.

All schools, including the control group, delivered data to the study. Hence, all were aware that they were part of an experiment, and any researcher effects should affect all experimental groups equally, and therefore not affect the difference in outcomes that we use to identify the effect of diversity. This resolves the risk that the results arise because of a Hawthorne effect, i.e. the treatment group behaves differently not because they receive a treatment, but because they are aware they are being studied in a way that the control group is not. Furthermore, the status quo-group received a treatment, so comparisons between this group and the two other interventions would be net of any Hawthorne effects pertaining specifically to being treated.

Dependent Variable: Performance Information Use

We employ performance information use as a dependent variable, based on survey questions previously employed by the US Government Accountability Office (Lavertu and Moynihan 2013), but adapted them to reflect the Danish educational setting. Principals were asked about two specific types of performance data available to them. The first was on student well-being, which 80% of principals surveyed identify as a top priority (compared to 18% prioritizing academic test scores). The second and more conventional type of performance data available to principals is student academic achievement. Principals were therefore asked to rank, on a scale of 1-5, where 1 = very low extent; 5 = very high extent, “To what extent do you use information on student well-being” and “To what extent do you use information on student academic achievements,” when they make different types of decisions: set program priorities; allocate resource for next year’s budget; identify program problems to be addressed; set new or revise existing performance goals; reward teachers; and discuss school progress with the administration. Because principals were asked about both student well-being and academic achievements for six different types of decisions there were twelve separate responses. A principal component factor analysis supports the use of a single index for these items (see table 1) (Cronbach’s alpha = .861). The two items on rewarding teachers could be seen as a separate factor. However, results are similar if we leave those two items out of the index. The measure of performance information use is based on the factor scores and is standardized to have mean 0 and standard deviation 1.

[Table 1]

Prior work suggests that the effects of diversity on group performance take time to occur (Watson, Kumar and Michaelsen 1993). To allow sufficient time for the treatments to have an effect, and to minimize the risk that these effects were purely short-term, we allowed a seven-month gap after the provision of the treatments before we surveyed principals on performance information use.

Moderator: Perceptions of Organizational Culture

To measure the perceived innovativeness of the organizational culture, we draw upon previously developed measures of developmental cultures (Zamutto and Krakower, 1991). Developmental cultures draw from a broader typology of organizational culture and are characterized by flexibility, adaptability and readiness for change. We employ a shortened scale with two items used in previous work (e.g. Moynihan and Pandey 2010): “My department is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks” and “The glue that holds my department together is a commitment to innovation and development” with responses on a five point scale where 1 = strongly disagree, and 5 = strongly agree. These two items are highly correlated, with an alpha score of .763. The measure spans from -4.1 to 1.5 with mean 0 and standard deviation 1.

In order to protect against the risk that the treatments themselves alter culture, perceptions of culture were collected via a survey of the participating principals as the treatments were being put in place, rather than at a later point. This also minimizes the potential of common source bias generating artificially high correlations between the moderator and our measure of performance information use, since, as we explain above, the dependent variable was collected at a later time using a different survey instrument.

Results

Evidence for our hypotheses is provided in table 2. Model 1 provides the results for our first hypothesis. The results do not offer support for this hypothesis. Compared to the control group who received no new personnel, adding functional diversity does not – across all organizations in the sample – direct leadership attention to the use of performance data. While the direction of the effects is as hypothesized – both educational diversity treatments are positively associated with performance information use – the results are not statistically significant. Overall, therefore, we do not see a direct relationship between the types of organizational change induced in the organization and performance information use. One possible reason we do not see significant results is that the degree of diversity added was simply not enough to represent a significant change in the organization. Adding a single employee with a different background may not be sufficient to direct leadership attention to understanding the effects of that employee.

[Table 2]

However, the results show that how leaders responded to organizational change was conditioned by their assessment of the organizational culture, which is consistent with our second hypothesis. This is seen from the significant interaction terms between perceived innovative culture and educational and role diversity in model 2. In organizations where the leader perceived a culture marked by low innovation, they become more likely to respond to both the educational diversity and role diversity treatments with greater use of performance data. By

contrast, the innovativeness of the organizational culture does not make leaders any more or less likely to respond to the hiring of staff with the same background as existing staff.

To illustrate this, figures 1, 2 and 3 demonstrate the marginal effects of each of the treatments. The general pattern for both the role diversity and educational diversity effects are similar (figures 1 and 2). As leaders view the organizational culture as less innovative (moving to the left of the figure) the slope of performance information use moves upwards. By contrast, the line for the status quo treatment (figure 3) is flat, featuring no variance in performance information use regardless of leadership assessment of organizational culture.

[Figures 1, 2 & 3]

Another way of considering the results is to ask for what proportion of organizations we find a statistically significant positive effect of diversity on performance information use. The answer to that question obviously depends on level of significance used and the distribution of innovative culture in the sample. Using 95 % confidence intervals, as we do here, the marginal effects become significant around -1 standard deviation below the mean (the innovative culture variable is standardized with mean 0 and standard deviation 1). That roughly corresponds to about 16% of the schools in the sample experiencing a positive effect. Decreasing the confidence level to 90% – which might be justified by the fact that interaction effects usually are of smaller magnitude and thus prone to Type II errors – means that the marginal effect becomes significant around -0.5 standard deviation corresponding to about 31 % of the organizations. However, the general theoretical lesson, that the effect of diversity depends on how leaders' perceive the

culture, is confirmed by the significant interaction term regardless of the specific distribution of perceived innovative culture in our sample.

One difference between educational and role diversity treatments is that the effect of the role diversity (figure 1) treatment is positive in organizations with a less innovative culture, and becomes insignificant in organizations with the most innovative culture. The positive effects of the educational diversity (figure 2) hires use are limited to organizations with a less innovative culture, but these effects become negative in organizations with the most innovative culture (the observed range of the culture index goes from -4.1 to 1.5). In highly innovative cultures the introduction of educational diversity might have a negative effect on leadership attention to performance data, perhaps because in such organizations leaders respond to diversity in ways other than looking to performance data. For example, leaders in innovative organizations might focus more on trying to integrate new hires with functional diversity into a set of cultural norms they perceive to be successful. While the difference between educational diversity and role diversity is not statistically significant, an obvious potential research question is how different types of diversity, even different types of functional diversity, generate different responses from leaders. These differential responses might occur because of a leader's own attitudes toward the diverse employees, or because of a leader's beliefs about the effect of functional diversity on the organization.

The variable "innovative culture" in model 2 of Table 1 shows that in the control group (the reference category) there is a positive and significant correlation between perceived innovative culture and leaders' use of performance information. The result suggests a direct positive relationship between innovative cultures and performance information use. This claim is not new (e.g. Moynihan, Wright and Pandey 2012), but is based on stronger causal design than

prior studies. While prior work relies upon single cross-sectional surveys to generate both independent and dependent variables, in our analysis the two variables come from separate surveys with a significant temporal gap, thereby reducing common source bias concerns. The result also provides some reassurance that the way in which our subjects perceive the relationship between innovative cultures and performance data is consistent with prior work rather than unique to our study.

The design of the field experiment and the use of both a control group and status quo treatment address most validity concerns, such as a concern that the effects are driven by a provision of resources, or occur because of a Hawthorne effect. As a robustness test we also replaced the control group with the status quo treatment group as reference category. This analysis (not shown, but available upon request) provide very similar results to those provided in Table 2, providing further reassurance that the results are not driven by the fact that school principals were assigned any new employee. The seven-month delay between the implementation of the treatment and the surveying of respondents reduces concerns that the effects depend upon temporal proximity to the treatment and may fade over time. As a robustness test, we also employed a pre-treatment survey of school principals that included prior measures of performance information use. The results are robust to the inclusion of this measure, providing further confidence that they are derived from the treatment.

Conclusion

This paper examines the role of functional diversity as a form of change in public organizations. While this framing of diversity has gained attention in organizational studies more generally, it represents an alternative conceptualization to bio-demographic approaches that

characterize public management scholarship. Our analysis demonstrates the utility of applying a functional diversity framework in a public management setting. We show how this framework offers insight on the topic of performance information use, a variable of growing interest in public management studies. For studies of performance information use, our field experiment offers the first systematic effort to model how organizational changes motivate greater attention to performance data. Our results suggest that leaders become more likely to use performance data in the aftermath of organizational change, but only under conditions where they see their organization's culture as lacking innovation.

The functional diversity framework could also be used to validate if existing findings from private sector settings on the effects of functional diversity apply to the public sector, focusing on variables such as employee conflict, decision time, problem solving, innovativeness, and performance. The relative importance of different types of diversity – not just bio-demographic versus functional diversity, but also different types of functional diversity – could also be explored. Our study examined two types of functional diversity, role and educational diversity, but there are other ways to study this topic. These are largely untested questions in the public setting.

Our paper brings the leader into discussions of diversity, not just in terms of managing diversity programs, but also in terms of how leaders actually respond to diversity. While our interest is in performance information use, future research could usefully distinguish between types of leadership responses to different types of changes, vary the conditions under which such responses occur, and examine whether such responses ultimately improve organizational outcomes.

The field experimental approach we utilize here is ideally suited to understanding the effects of organizational change. Such an approach can be expensive and complex to implement, and often requires an administrative partner willing to construct experimental conditions. But it may be possible to introduce smaller field experiments of a wide array of potential organizational changes to observe behavioral responses by not just leaders, but managers and other employees. We find that diversity affects leadership in organization with low perceived innovative culture. But these organizations may also be different in other aspects. Future research could look at alternate moderators to how leaders or other employees respond to change, such as motivation.

There are limitations to our findings, but these limitations invite further research. One question that emerges is whether the findings hold if we move beyond the field of education, where performance data is especially salient (Moynihan and Hawes 2012). In other policy fields, the lower salience of performance data may limit the degree to which it is relied upon as a response to organizational change. On the other hand, one broad change across policy fields in recent decades is the growing salience of performance data to governance (Van Dooren, Bouckaert and Halligan 2010). Another limitation is that leadership response might depend a good deal on the type of changes that occur. For some changes, the use of performance data might be a logical response, but for other changes, leaders may respond in different ways, such as increasing attention to managing outwards via networking, for example. A final caveat to our findings is that the effects of diversity may depend on temporal factors. Pitts and Jarry (2009) show that time reduces the negative effect of diversity on performance in Texas schools. It may be that leadership response to changes in employee diversity may also be temporal, varying in its intensity across time.

There are practical implications of our work for organizations and leaders. While there are obvious limitations to the external generalizability of our work, patterns of diversification may often come as the type of top-down external pressure or requirement for diversification that we model in our experiment. Another practical implication for leaders is about diversification and culture. Culture is an important variable, but one that may be deeply embedded and difficult to change (Khademian 2002). Diversity research suggests that adding functional diversity is a way of adding innovation to an organizational culture, and our results offer a complementary finding: If leaders find themselves in a culture they see as non-innovative, they become more responsive to the addition of functional diversity.

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Table 1. Principal component factor analysis of leadership use of performance information

	1	2	3	4
To what extent do you use information on <i>student wellbeing</i> , when you				
- Set program priorities	.649			.446
- Allocate resources for next year's budget	.499		-.589	
- Identify program problems to be addressed	.587			.512
- Set new or revise existing performance goals	.722			
- Reward teachers	.541	.683		
- Discuss school progress with the administration	.520		.403	
To what extent do you use information on <i>student academic achievements</i> , when you				
- Set program priorities	.749			
- Allocate resources for next year's budget	.642		-.463	
- Identify program problems to be addressed	.672			
- Set new or revise existing performance goals	.744			
- Reward teachers	.577	.637	.406	
- Discuss school progress with the administration	.580		.427	

Note: Blank cells represent absolute factor loadings less than .4

Table 2. The effect of functional diversity on leadership use of performance information

	(1)	(2)
Control group	ref.	ref.
Educational diversity	0.0310 (0.215)	0.0625 (0.212)
Educational diversity*Innovative culture		-0.593** (0.200)
Role diversity	0.271 (0.232)	0.285 (0.228)
Role diversity*Innovative culture		-0.309† (0.174)
Status quo	-0.0471 (0.224)	-0.00449 (0.225)
Status quo*Innovative culture		-0.0116 (0.247)
Innovative culture		0.242* (0.108)
Constant	-0.0408 (0.129)	-0.0347 (0.127)
Observations	200	200
R-squared	0.011	0.063

OLS regression. Standard errors in parentheses. Control for randomization group 1 included but not shown (see appendix for explanation)

** p<0.01, * p<0.05, † p<0.10

Figure 1. Marginal effects of role diversity on leadership use of performance information – dependent on perceived innovative culture

Note: Marginal effects with 95% confidence intervals.

Figure 2. Marginal effects of educational diversity on leadership use of performance information – dependent on perceived innovative culture

Note: Marginal effects with 95% confidence intervals.

Figure 3. Marginal effects of status quo on leadership use of performance information – dependent on perceived innovative culture

Note: Marginal effects with 95% confidence intervals.

APPENDIX

1. Description of the randomization procedure

The Danish Ministry of Education invited all 98 Danish municipalities to participate with their schools in a randomized controlled field experiment regarding co-teaching. 68 municipalities applied. Among the applicants, 18 municipalities were selected including 230 schools. The municipalities were selected intentionally to create diversity in terms of geography and school size. The 18 municipalities were divided into two groups. In Group 1 schools were assigned to either the hiring of consultants (role diversity-treatments) or control group. In Group 2 schools were assigned to either hiring co-teachers (status quo-treatment), teaching assistants (educational diversity-treatment) at other schools. Within each of these two groups, schools were stratified based on the predicted test score average of the present cohort of 6th grade students. Within each strata schools were randomly assigned the treating conditions. In Group 1 the conditions were either no additional hires or the role diversity hire. In Group 2 the conditions were either no additional hires, the status quo treatment or the educational diversity group. Controlling for Group 1 does not alter the results substantially.

Figure A1 is a diagram of the experimental randomization procedure.

Figure A1. The Experimental Randomization Procedure

2. Balance of the experimental groups

Table A1 shows that the experimental groups are balanced on a wide range of observed variables.

Table A1. Test for equal average characteristics of schools in the control and treatment groups

	(1)		(2)		(3)	(4)					
	Control group		Treatment groups (all pooled)		Test: equal means (1)=(2)	Treatment groups					
	mean	std.dev.	mean	std.dev.	Difference	Status quo mean	std.dev.	Edu diversity mean	std.dev.	Role diversity mean	std.dev.
School size (6th grade cohort)											
Number of students	57.35	(2.06)	57.31	(2.13)	-0.04	60.12	(3.63)	56.39	(4.03)	54.91	(3.36)
Number of classes	2.65	(0.09)	2.61	(0.09)	-0.03	2.69	(0.16)	2.65	(0.18)	2.47	(0.12)
Number of students per class	21.72	(0.35)	21.70	(0.36)	-0.03	22.34	(0.58)	21.06	(0.55)	21.59	(0.69)
Number of students with special needs	5.33	(0.44)	6.99	(0.46)	1.66***	7.02	(0.73)	7.80	(0.75)	6.08	(0.83)
Number of students with special needs per class	2.09	(0.16)	2.65	(0.16)	0.56**	2.60	(0.23)	2.95	(0.25)	2.39	(0.32)
Teachers at 6th grade											
Male	0.35		0.37		0.02	0.41		0.36		0.31	
Age	44.09	(0.66)	44.38	(0.69)	0.29	45.30	(1.12)	44.73	(1.13)	42.83	(1.35)
Quality of teaching staff (scale 1 to 5, where 5 is 'excellent')	4.01	(0.05)	3.93	(0.05)	-0.08	3.84	(0.09)	4.01	(0.09)	3.95	(0.09)
Quality of teaching staff: Excellent	0.13		0.10		-0.03	0.06		0.10		0.15	
Quality of teaching staff: Excellent or good	0.88		0.84		-0.05	0.79		0.90		0.82	
School principal											
Male	0.53		0.60		0.06	0.53		0.58		0.70	
<i>Which of the following three is the most important at your school?</i>											

- Inclusion of students with special needs	0.17	0.10	-0.07	0.11	0.10	0.09
- Create the best learning environment for the school's current students	0.83	0.89	0.06	0.89	0.90	0.88
- Create better opportunities for high ability students	0.00	0.01	0.01	0.00	0.00	0.03
<i>Which of the following three is the most important at your school?</i>						
- Students national test scores	0.06	0.05	-0.01	0.05	0.00	0.09
- Inclusion of students with special needs in the ordinary classroom teaching	0.13	0.15	0.01	0.14	0.15	0.14
- Students general well-being at the school	0.81	0.81	0.00	0.81	0.85	0.77
School average achievement level						
<i>Average student ability at the pre-tests</i>						
Reading 6th grade, autumn 2012	-0.03	(0.03)	-0.01	(0.03)	0.02	-0.02 (0.05) 0.02 (0.06) -0.05 (0.06)
Math 6th grade, autumn 2012	-0.03	(0.03)	-0.02	(0.03)	0.00	0.00 (0.06) 0.04 (0.06) -0.13 (0.05)
Reading 4th grade, spring 2011	0.01	(0.03)	0.03	(0.03)	0.02	0.04 (0.04) 0.05 (0.05) -0.02 (0.05)
Math 3rd grade, spring 2010	-0.03	(0.03)	0.01	(0.03)	0.04	-0.04 (0.05) 0.09 (0.06) -0.03 (0.06)
<i>Average student ability at previous 6th grade cohorts</i>						
Reading 6th grade, spring 2012	0.00	(0.03)	0.01	(0.03)	0.02	0.04 (0.05) -0.03 (0.05) 0.03 (0.07)
Reading 6th grade, spring 2011	0.00	(0.03)	-0.02	(0.03)	-0.03	-0.05 (0.05) -0.02 (0.05) 0.02 (0.06)
Reading 6th grade, spring 2010	0.02	(0.03)	-0.02	(0.03)	-0.04	-0.01 (0.05) -0.01 (0.05) -0.03 (0.06)
Math 6th grade, spring 2012	0.05	(0.03)	0.00	(0.04)	-0.04	0.05 (0.06) -0.01 (0.06) -0.03 (0.06)
Math 6th grade, spring 2011	0.01	(0.04)	0.03	(0.04)	0.02	0.03 (0.06) 0.05 (0.06) 0.01 (0.07)
Math 6th grade, spring 2010	0.02	(0.03)	-0.03	(0.03)	-0.05	0.04 (0.05) -0.03 (0.06) -0.13 (0.06)
Average student proportions at the school						
Students with a mental or behavioral disorder	0.03	0.03	0.00	0.03	0.03	0.03
Students receiving special needs teaching (all four types)	0.10	0.12	0.03**	0.12	0.15	0.11
Non western immigrants	0.02	0.01	0.00	0.01	0.02	0.01

Non-western descendents	0.09	0.10	0.01	0.09	0.09	0.11
Single mothers	0.24	0.28	0.03	0.25	0.23	0.36
Mother age at birth (years)	28.77 (0.36)	28.11 (0.37)	-0.66	29.05 (0.53)	28.67 (0.56)	26.38 (0.84)
Mother income (10,000 kr)	24.60 (0.60)	23.82 (0.62)	-0.78	25.23 (1.05)	24.71 (1.10)	21.15 (1.05)
Both parents, compulsory schooling only	0.11	0.12	0.02	0.11	0.09	0.18
Both parents, non-academic education	0.60	0.60	0.00	0.59	0.57	0.63
Father employed	0.79	0.76	-0.03	0.79	0.79	0.71
Number of schools	112	109	221	35	35	39

Notes: *, **, *** indicate significance at the 10, 5 and 1 percentage level, respectively. In the last three columns: Bold cells indicate that the average school characteristic of the specific treatment group is significantly different from that of the schools in the control group at the 5 percentage level. Test for equal means is performed by a T-test (Z-test for equal proportions). Characteristics of the teacher and principal are obtained from the pre-survey among school principals. Student background characteristics are from register data measured in 2011, i.e. pre the announcement of the intervention. Individual test scores have been standardized with mean zero and standard deviation 1 within each year, grade and subject. SDQ is measured at a scale from 1 to 40.